



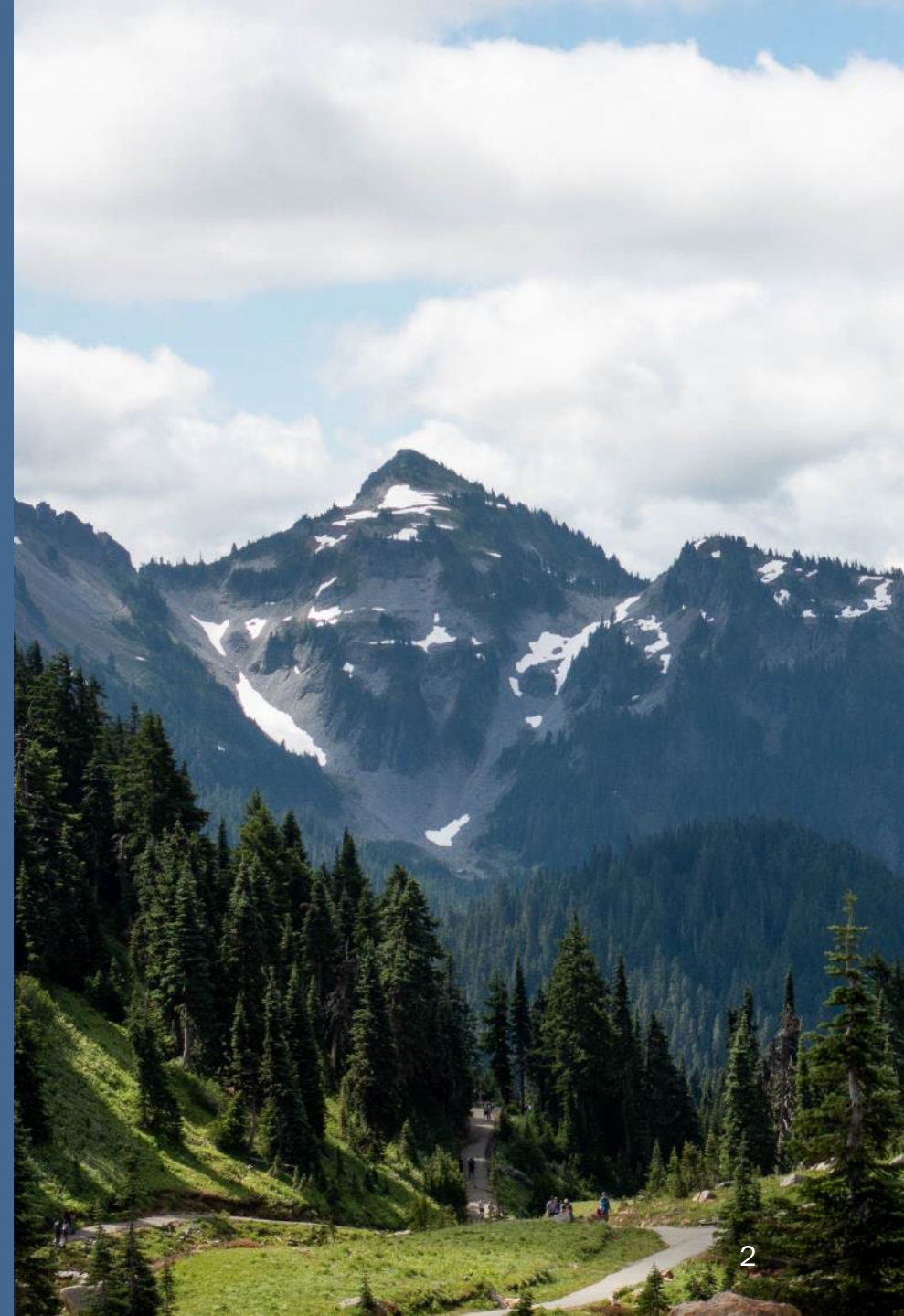
Water Supply Availability Committee

October 9, 2025

Water Resources Program



Recording!



Agenda

Time	Agenda item	Responsible
10:00 a.m.	Welcome and agenda Recap: Drought declaration process and implications	Caroline Mellor, Ecology
10:10 a.m.	Regional Climate Setting / ENSO	Karin Bumbaco, WASCO
10:25 a.m.	Guest topic: “The blob” or atmosphere-ocean systems	Nick Bond, WASCO
11:00 a.m.	Discussion: What water supply concerns do folks have for Water Year 2025?	All participants Ecology facilitates
11:15 a.m.	Wrap-up and next steps	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 state as we enter water year 2026.
- Learn about ocean-atmospheric interactions and potential implications for weather this water year.

Drought Emergency Declaration

On June 5, 2025, Ecology issued a drought emergency declaration in the **North and Central Cascade Mountains and parts of the Puget Sound area**, due to low snowpack, early and rapid snowmelt and a dry April and May.

This served as an expansion of the April 8, 2025, drought declaration for the **Yakima Basin watersheds**.

*The utilities of Everett, Seattle and Tacoma do not expect issues for their customers.



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
in 2025

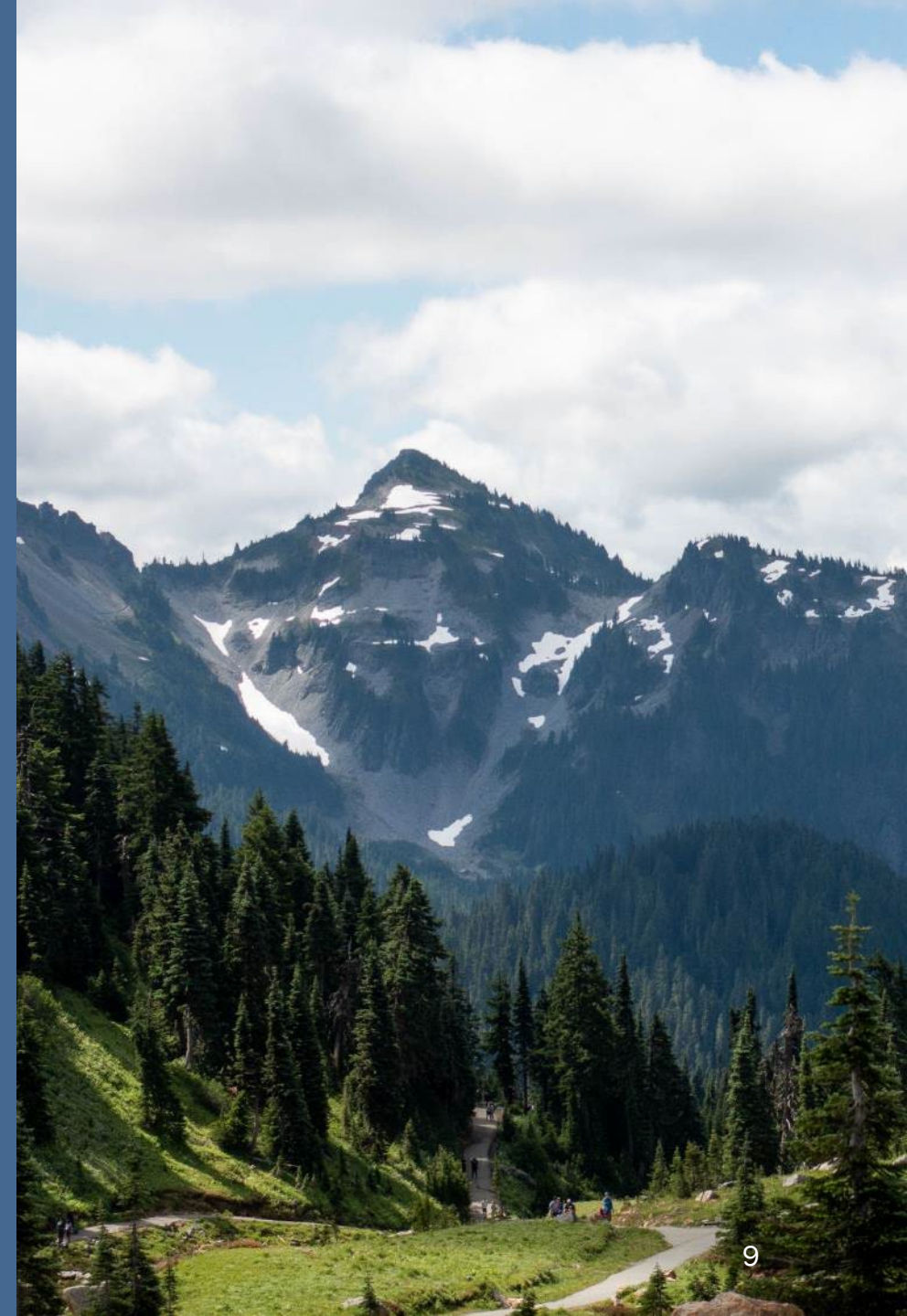
Forecasts

- Streamflow
- Precipitation
- Temperature
- Soil moisture





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

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

Drought Advisory

Advisory tool:

- Indicates that drought conditions may develop.
- Public awareness & preparation tool to support readiness.
- Drought relief tools not available.
- Acknowledges there are multiple types of potential drought impacts.



State Declaration vs Federal Designation

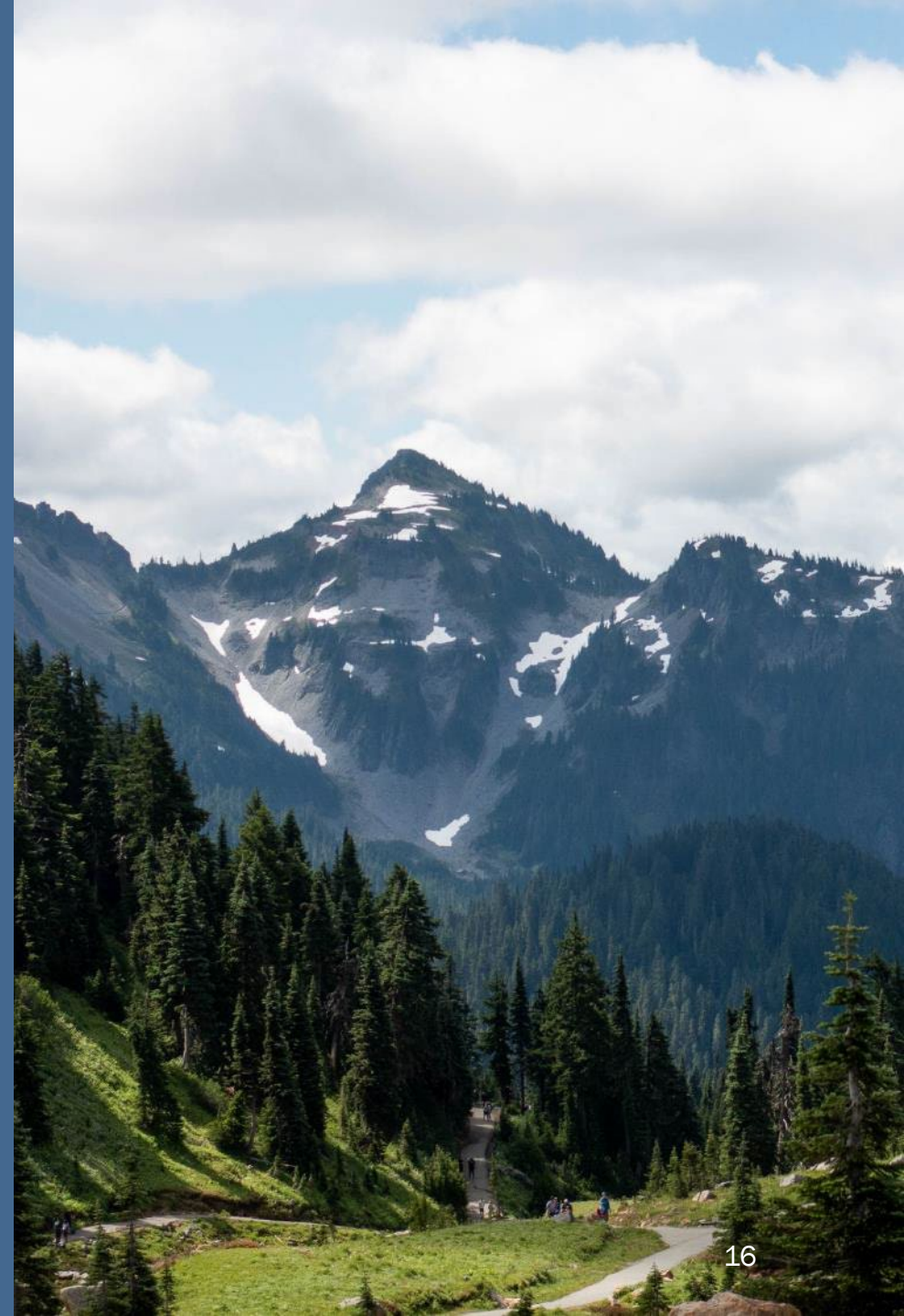


Different thresholds and different relief triggered

- Federal thresholds:
 - D2 level for 8 consecutive weeks or reach a D3 or D4 level for at least one day according to the U.S. Drought Monitor.
- Federal relief – main types:
 - Low-interest emergency loans for individual farmers.
 - Additional disaster relief for primary counties (example: livestock forage disaster aid) .



Presenters



Discussion Question

For all meeting attendees:

What concerns do folks have for Water
Year 2026?

Drought Info

Drought website: [Drought Response](#)

- Declaration: [Order of Determination by the Director](#)
- Press release: [June 5](#)
- Press release: [Oct 2025 Yakima curtailment](#)

[Water Supply Availability Committee \(WSAC\) website](#)

Recent Ecology drought blogs:

- [I thought this was called summer?](#)
- [July Update \(Federal vs state\)](#)
- [August blog \(Yes, it rained. No, the drought is not over\).](#)



Thank you

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



Current Conditions and Seasonal Outlook

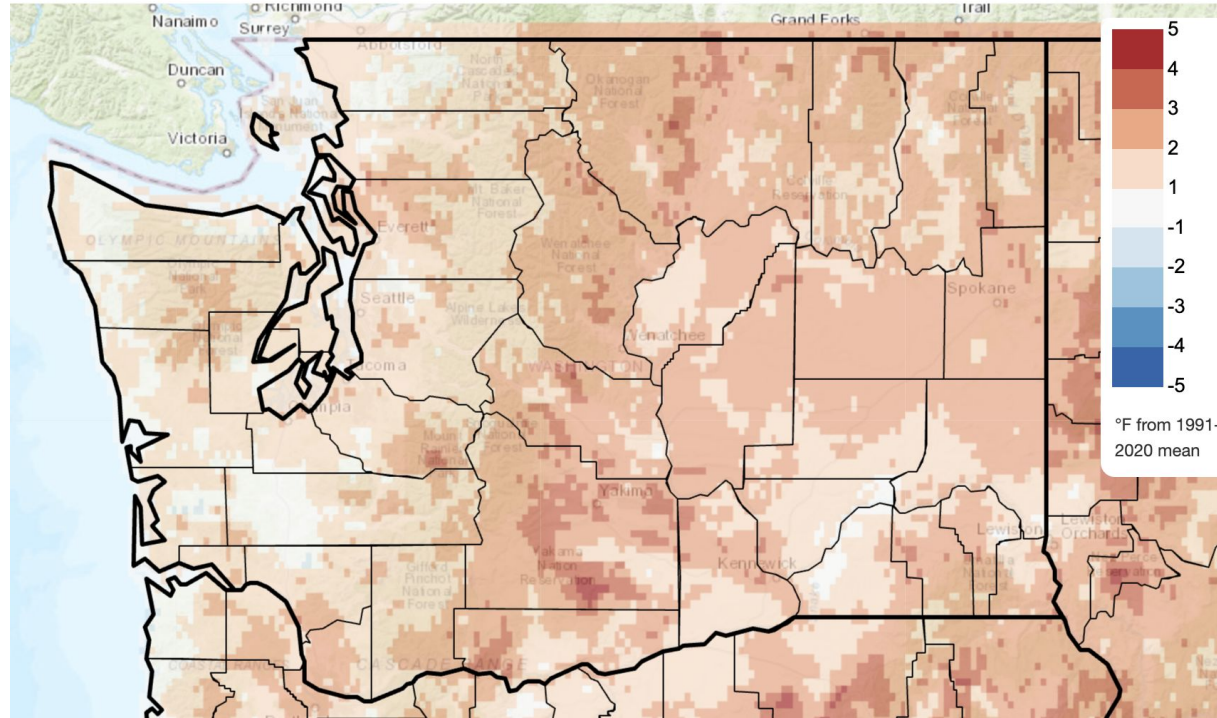
Karin Bumbaco
Washington State Climate Office
Climate Impacts Group
University of Washington
October 9, 2025

Water Year 2025

Temperature

Mean Daily Temperature Anomaly, Last Oct to Last Full Month

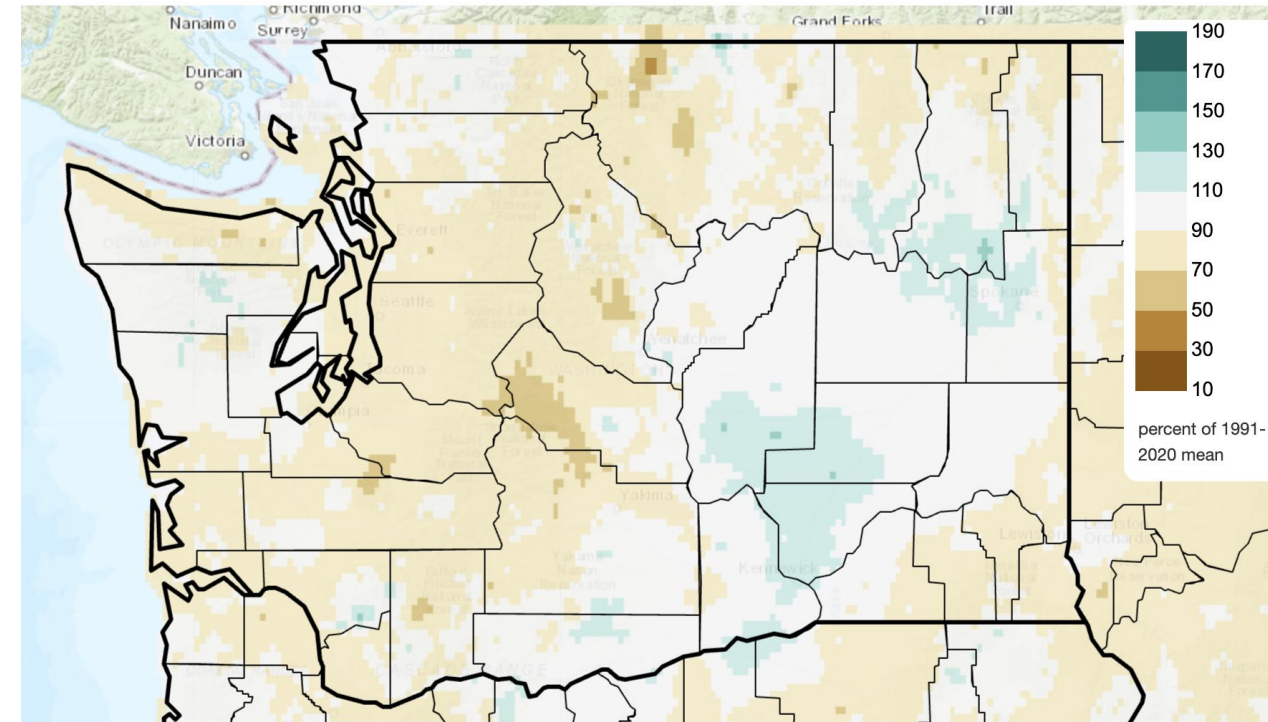
2024/10/01 - 2025/09/30



Precipitation

Total Precipitation Anomaly, Last Oct to Last Full Month

2024/10/01 - 2025/09/30



[Climate Toolbox](#)

- Averaged statewide, water year 2025 temperatures were above normal (+1.7°F), ranking as approximately the 4th warmest* on record behind 2015, 1934, and 1992
- Averaged statewide, water year 2025 precipitation was below normal (-4.97"; 89% of normal), ranking as approximately the 37th driest

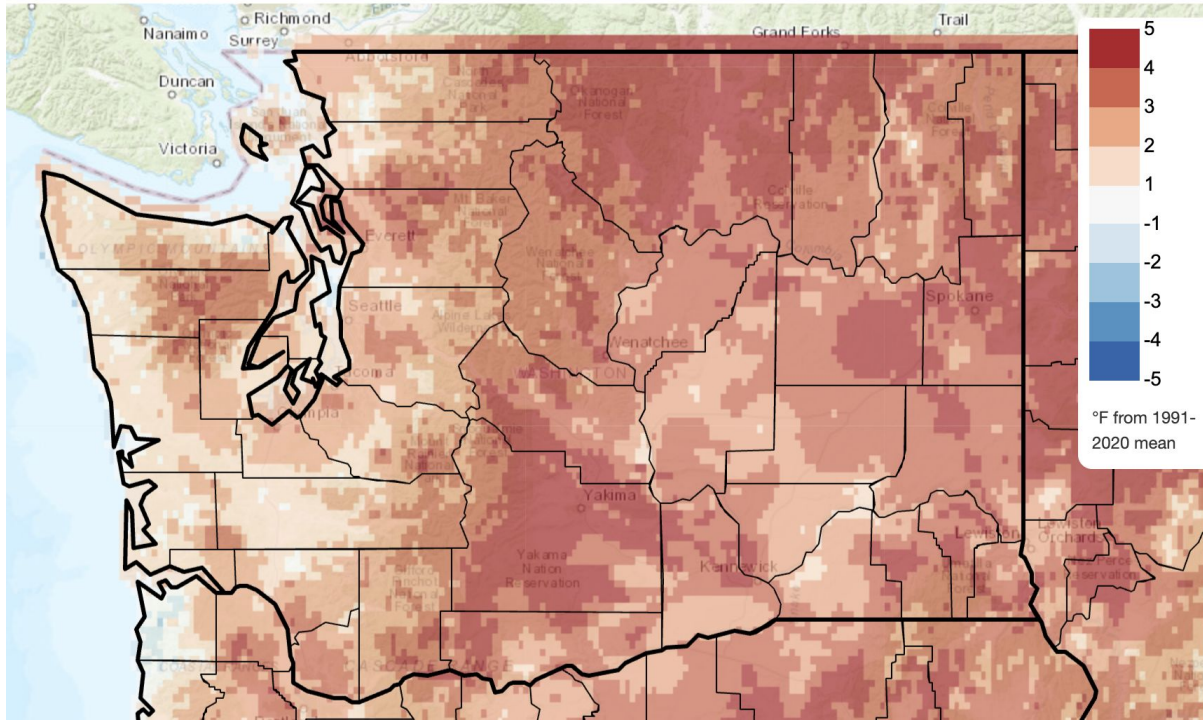
*Estimated from gridMET data due to the government shutdown; Normal is

Last 90 Days

Temperature

Mean Daily Temperature Anomaly, Last 90 Days

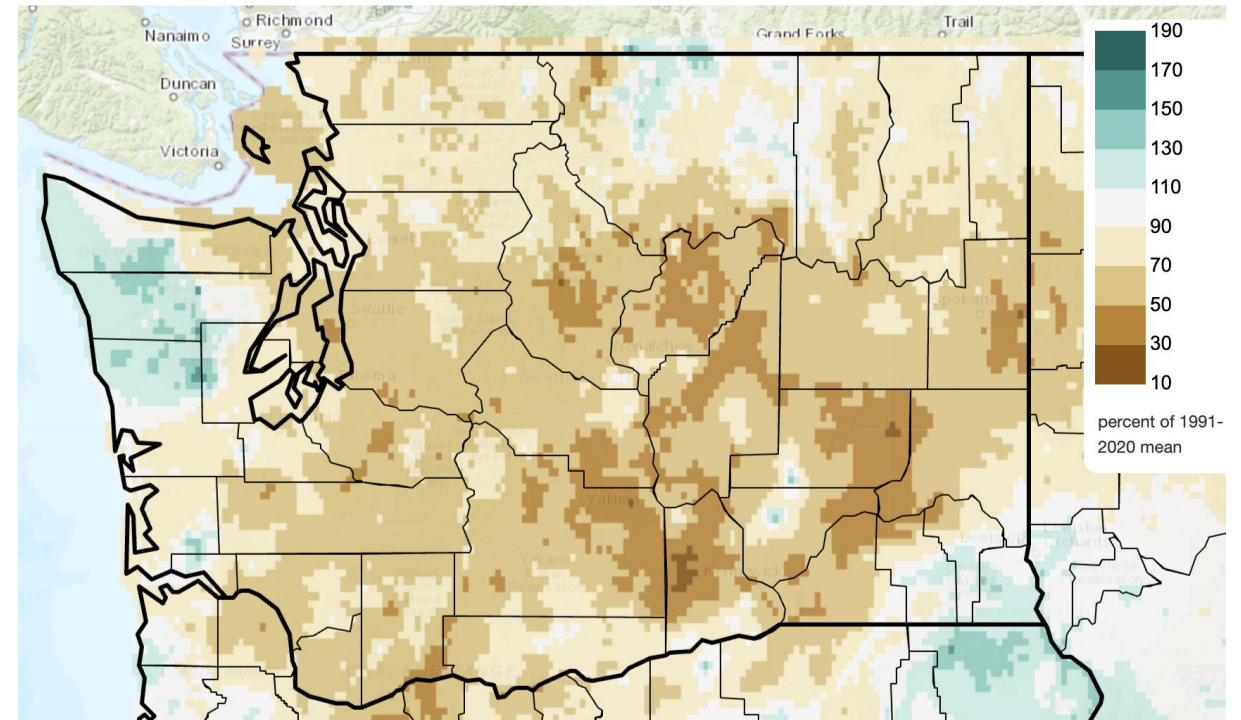
2025/07/09 - 2025/10/06



Precipitation

Total Precipitation Anomaly, Last 90 Days

2025/07/09 - 2025/10/06

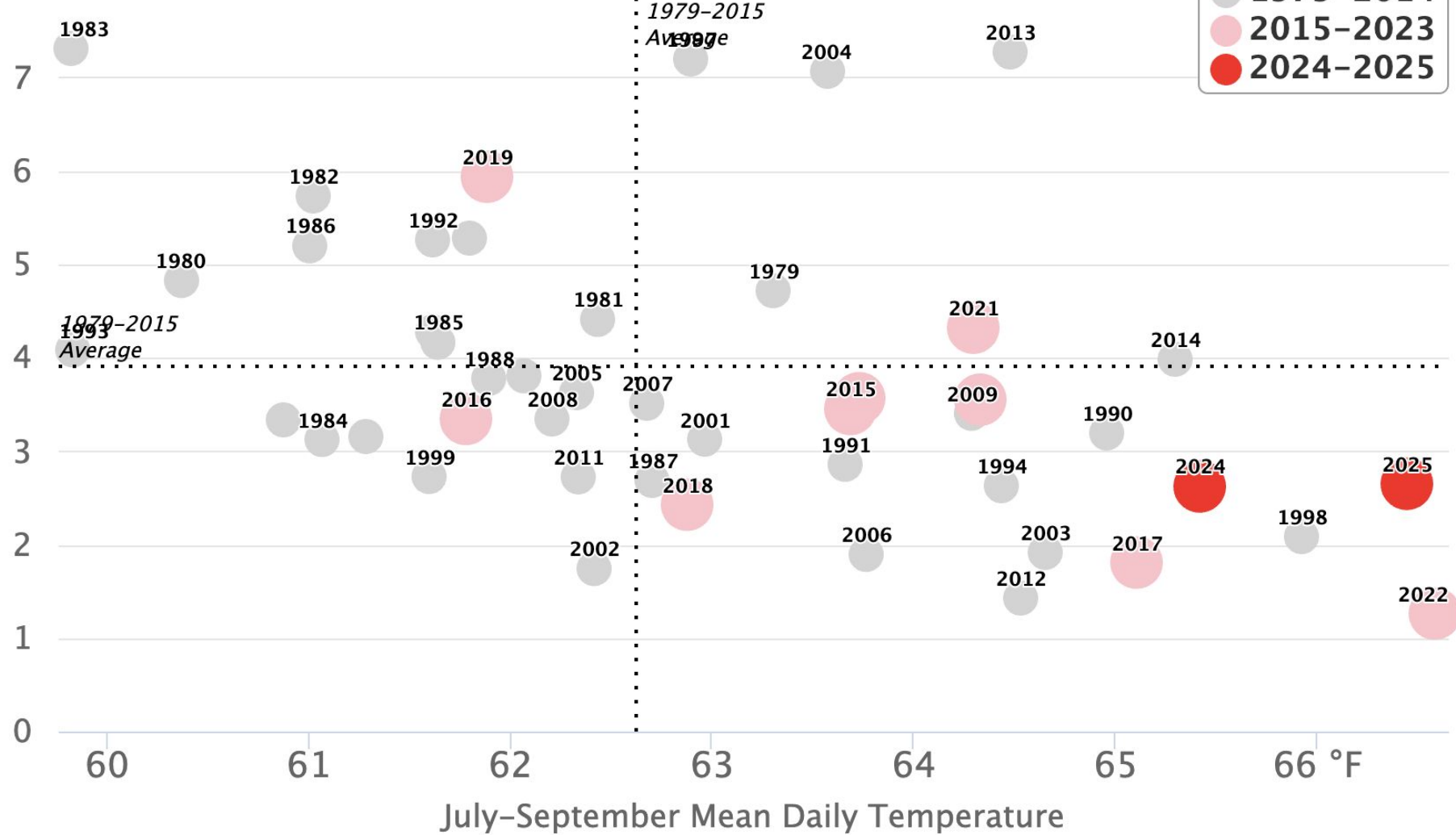


Climate Toolbox

Washington

July–September Precipitation

8 inches

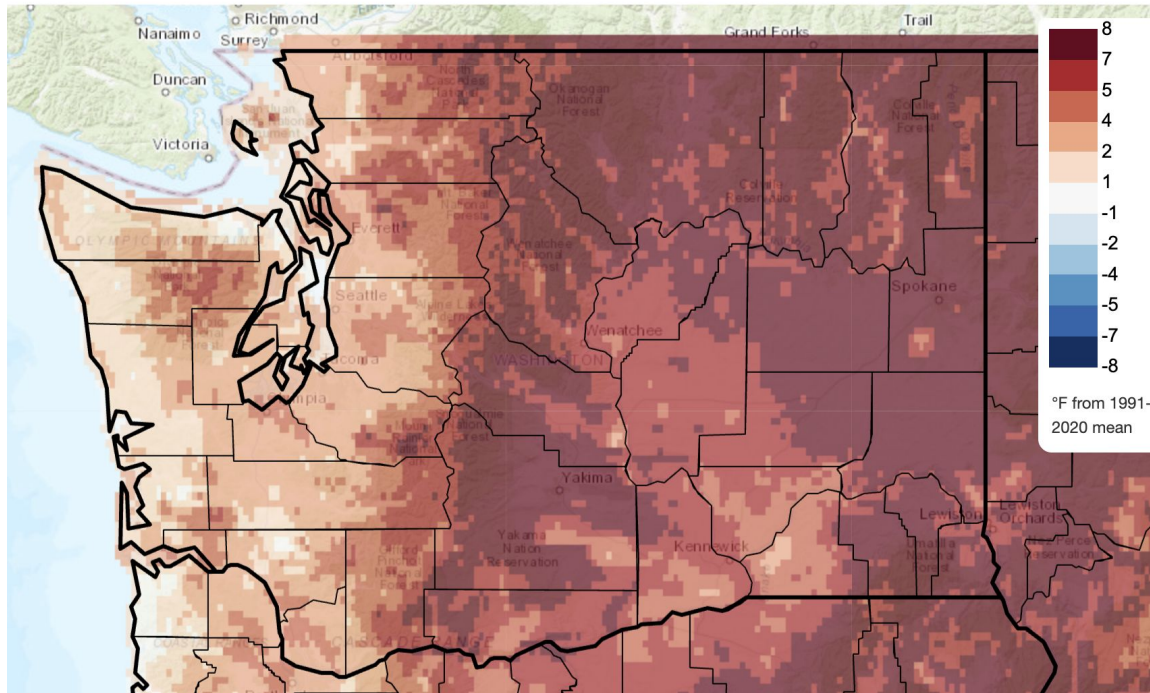


September 2025

Temperature

Mean Daily Temperature Anomaly, Last Full Month

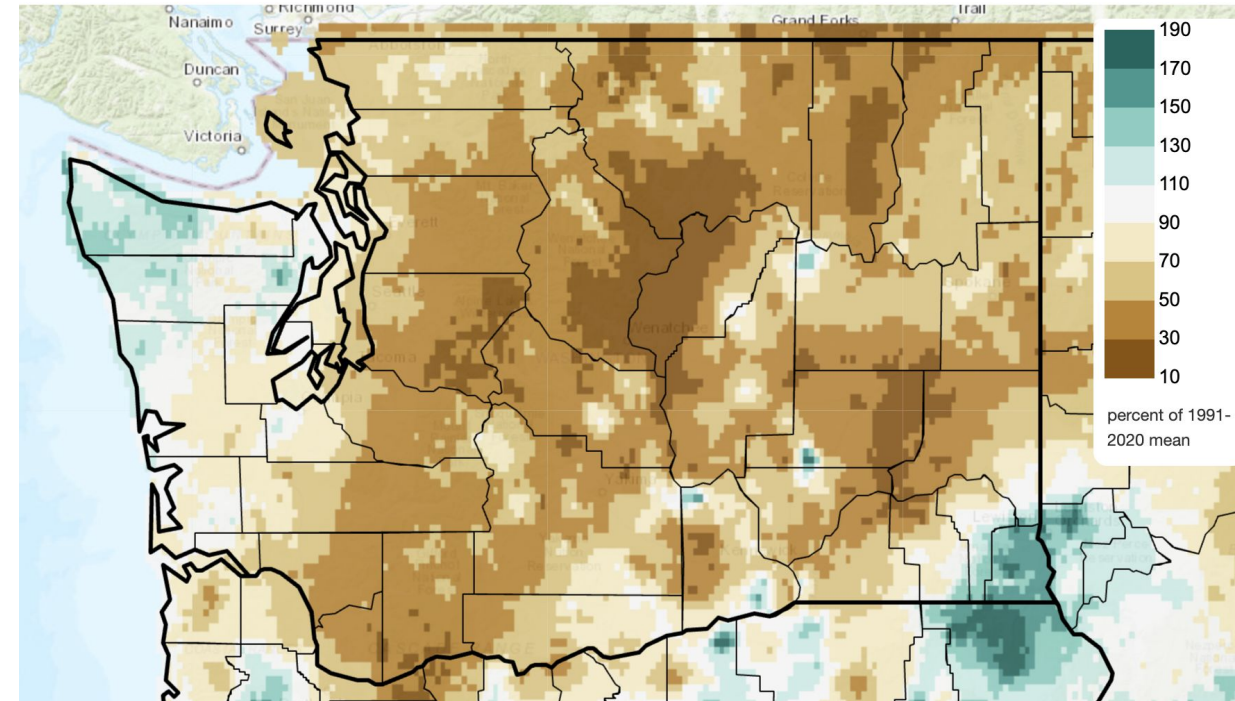
2025/09/01 - 2025/09/30



Precipitation

Total Precipitation Anomaly, Last Full Month

2025/09/01 - 2025/09/30

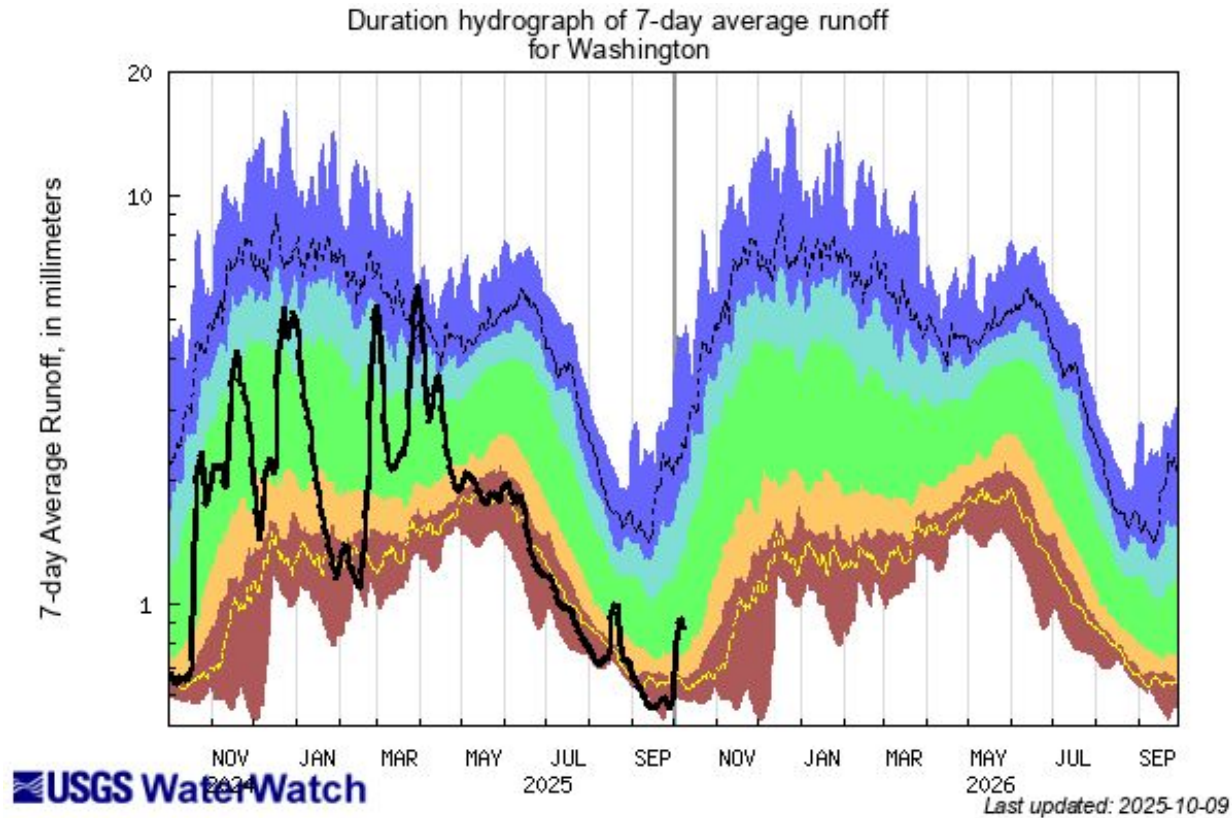


Climate Toolbox

- Averaged statewide, September temperatures ranked as *(possibly)* the warmest (+5.7°F) on record*
- Averaged statewide, September precipitation ranked as approximately the 32nd driest on record, with 61% of normal precipitation (-0.67")*

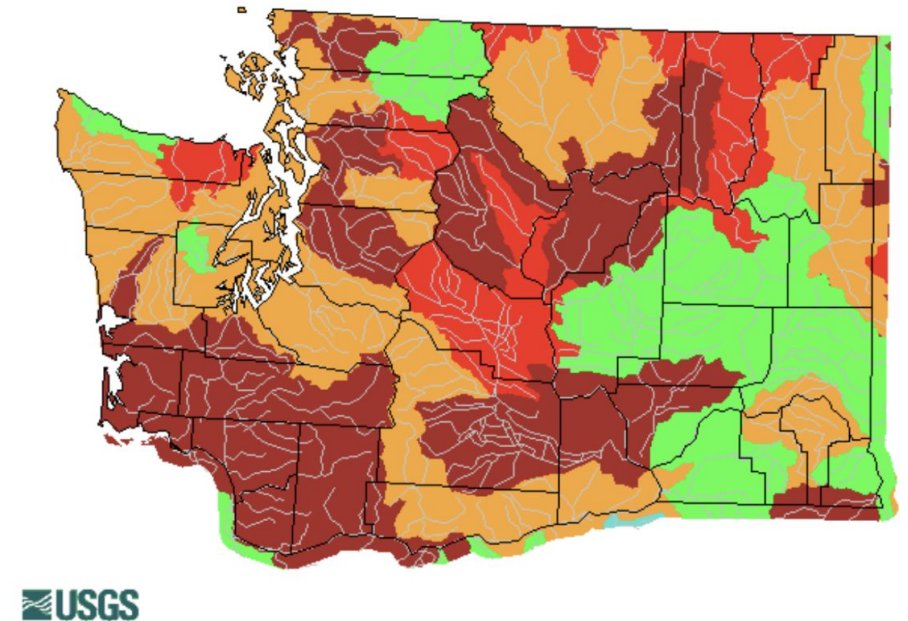
*Estimated from gridMET data due to the government shutdown; Normal is

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		

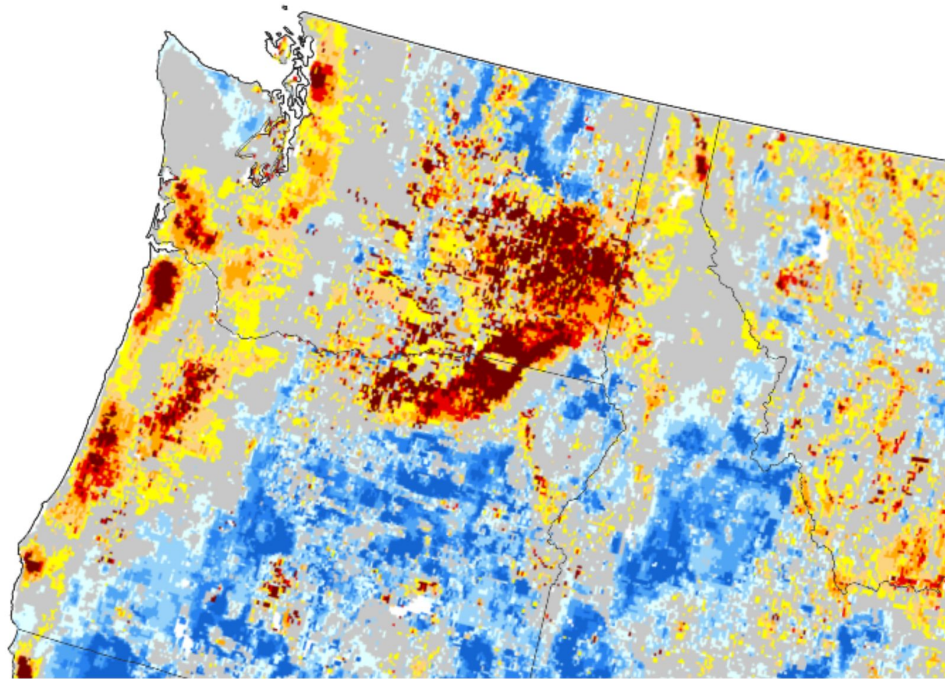
Map of monthly streamflow compared to historical streamflow for the month of the year (Washington)
September 2025



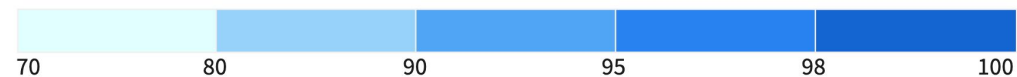
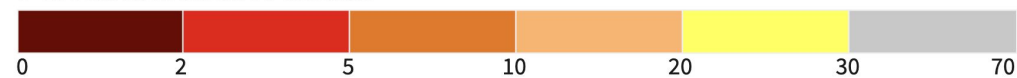
Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Soil Moisture

0–100 cm Soil Moisture Percentile



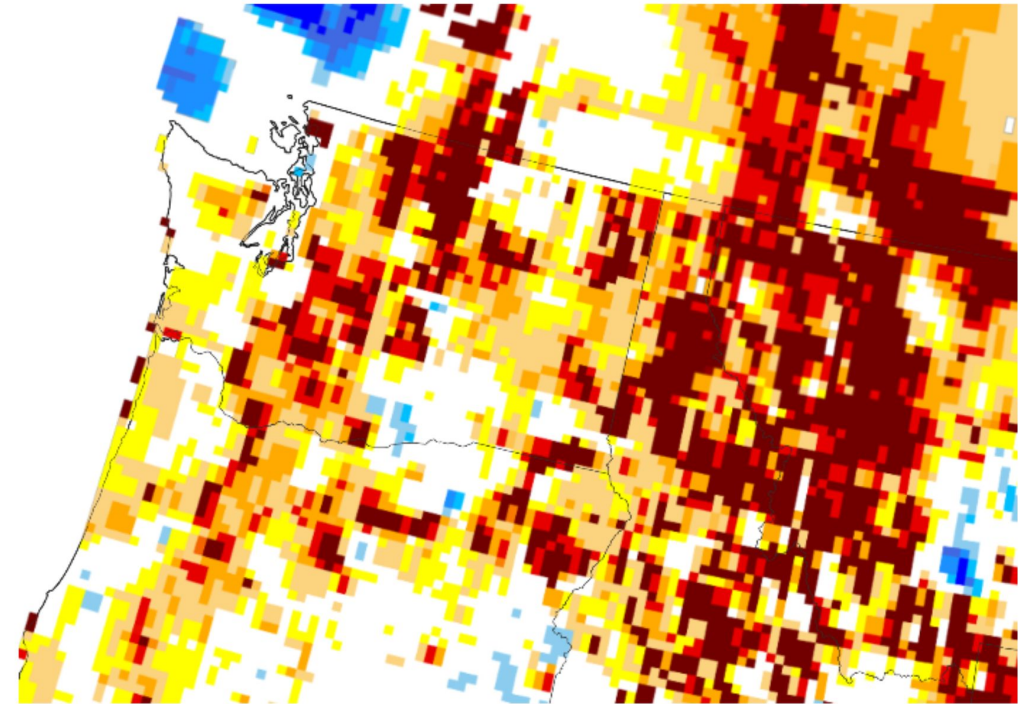
0–100 cm Soil Moisture Percentile



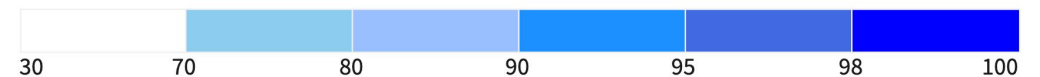
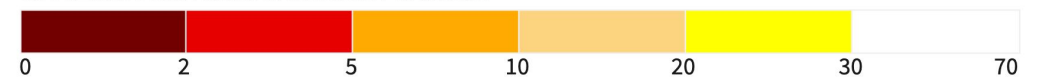
Source(s): NASA
Data Valid: 10/07/25

Drought.gov

GRACE Root Zone Soil Moisture Percentile



Root Zone Soil Moisture: Wetness Percentile



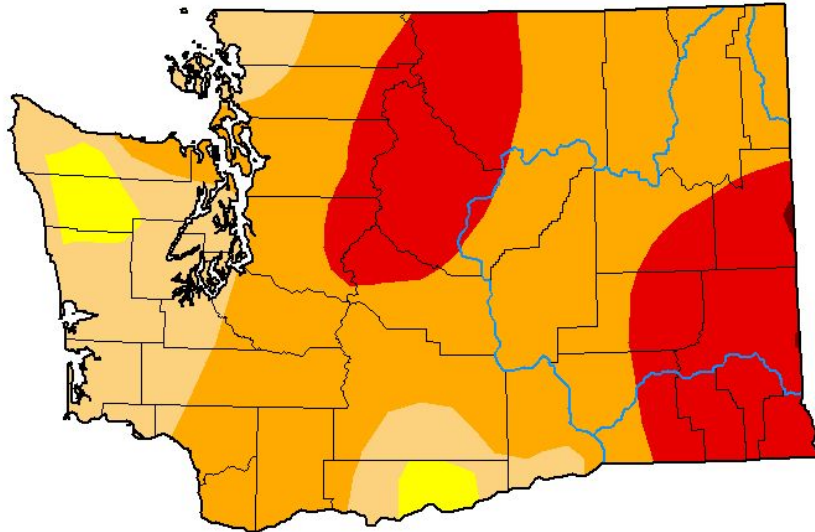
Source(s): NASA, National Drought Mitigation Center
Data Valid: 10/04/25

Drought.gov

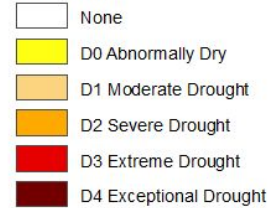
U.S. Drought Monitor

U.S. Drought Monitor Washington

October 7, 2025
(Released Thursday, Oct. 9, 2025)
Valid 8 a.m. EDT



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>

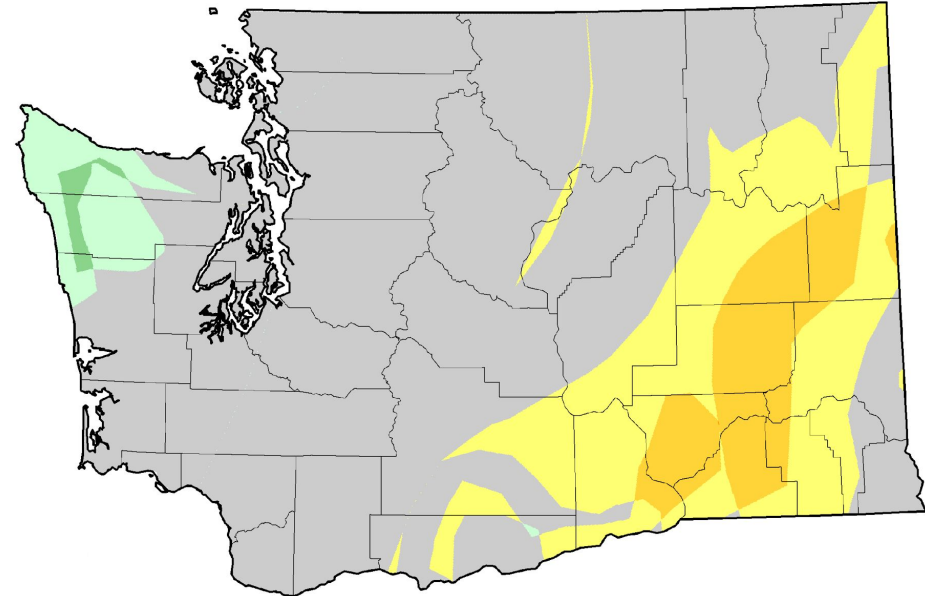
Author:

Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - Washington 8 Week



October 7, 2025
compared to
August 12, 2025

droughtmonitor.unl.edu



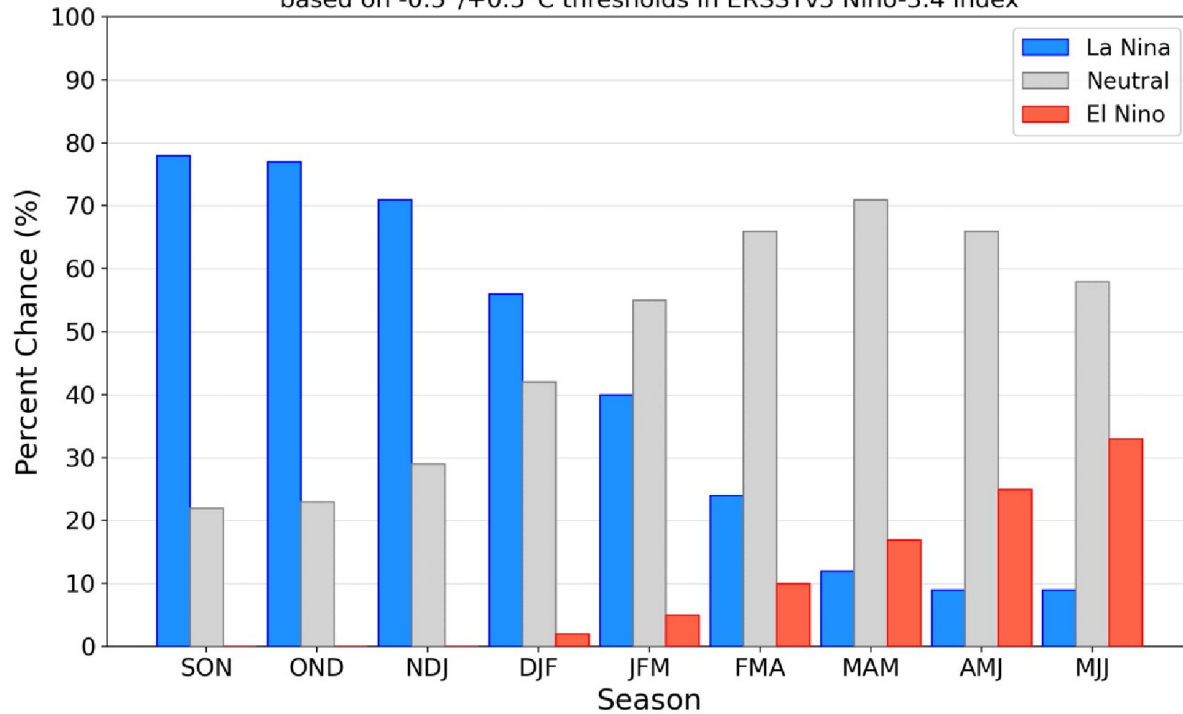
Current Status: La Niña

La Niña

Advisory

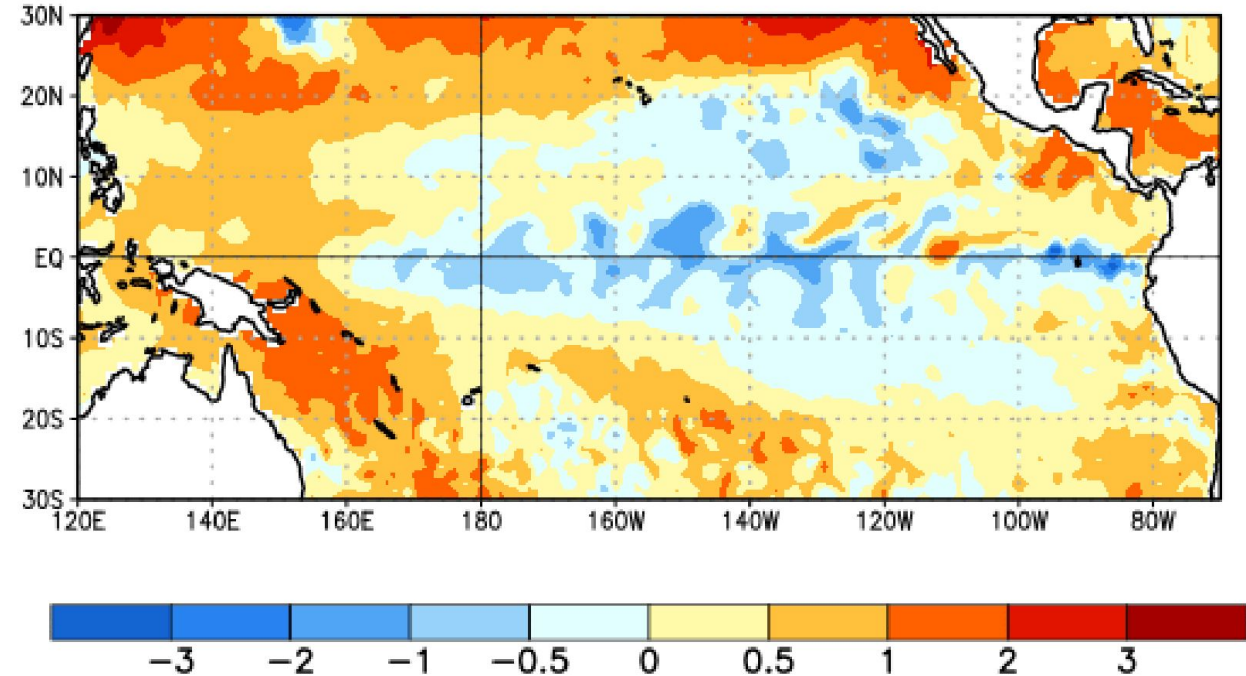
Official NOAA CPC ENSO Probabilities (issued October 2025)

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



SST Anomalies ($^{\circ}\text{C}$)

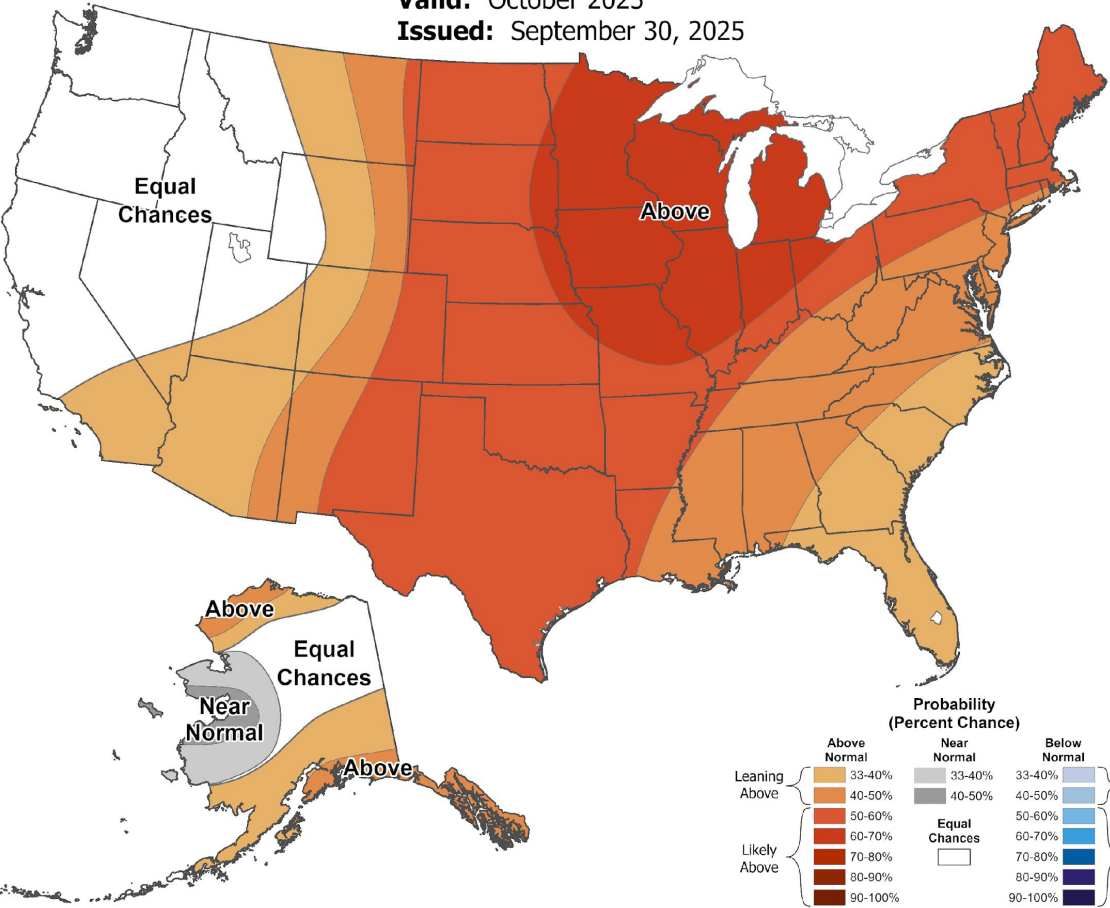
01 OCT 2025



Climate Prediction Center: October Outlook

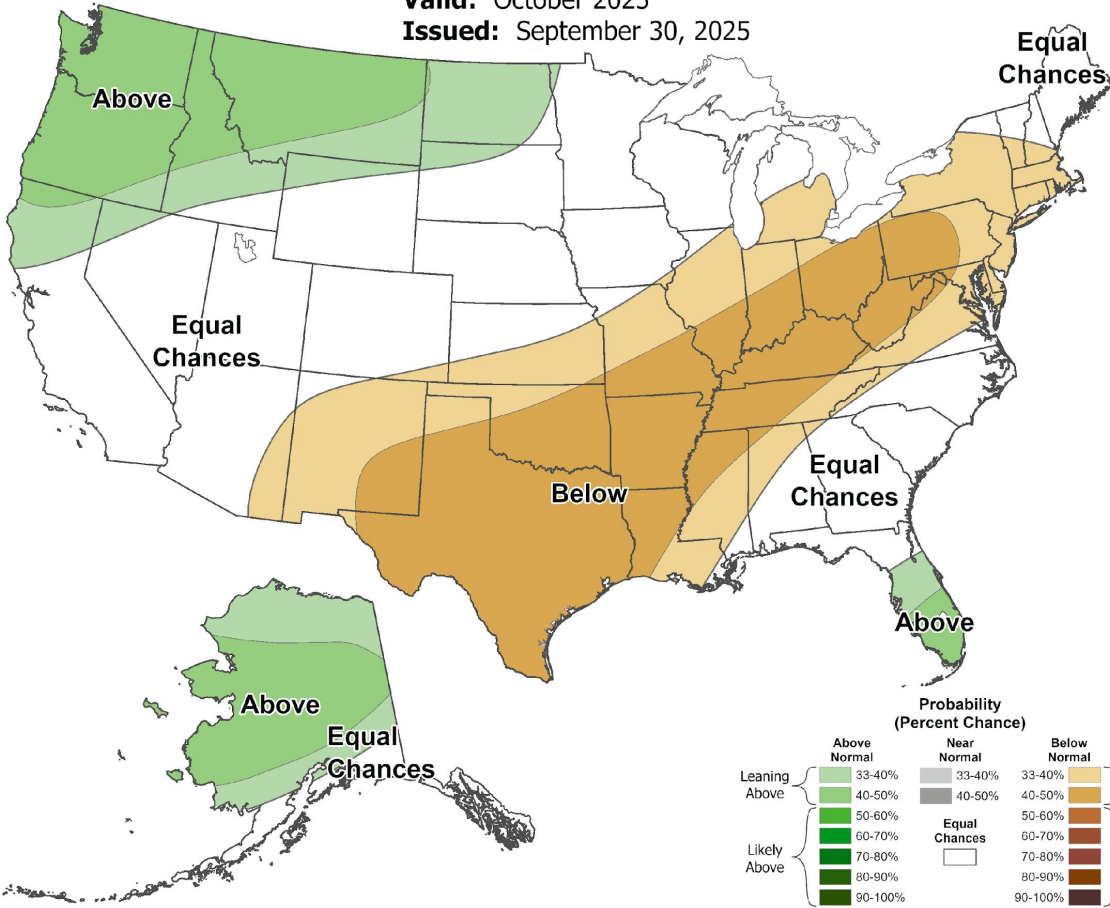
Monthly Temperature Outlook

Valid: October 2025
Issued: September 30, 2025

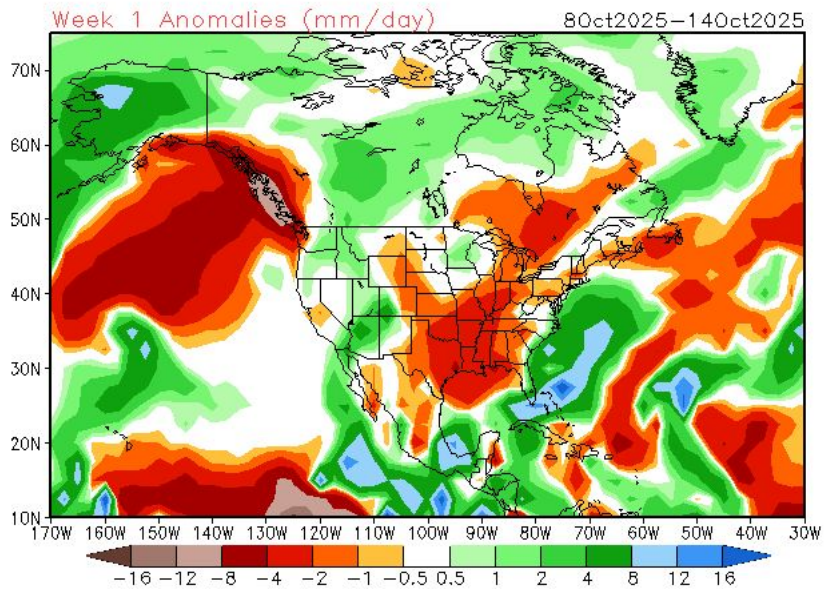


Monthly Precipitation Outlook

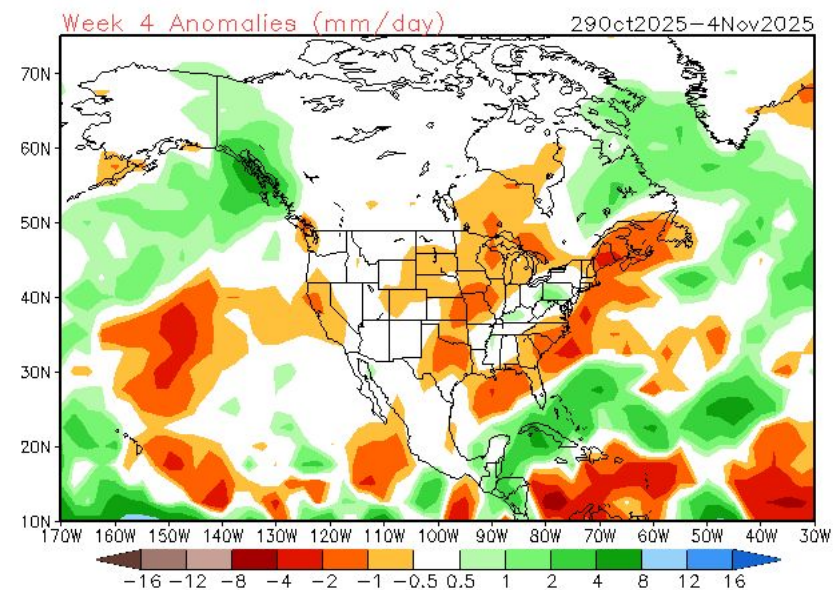
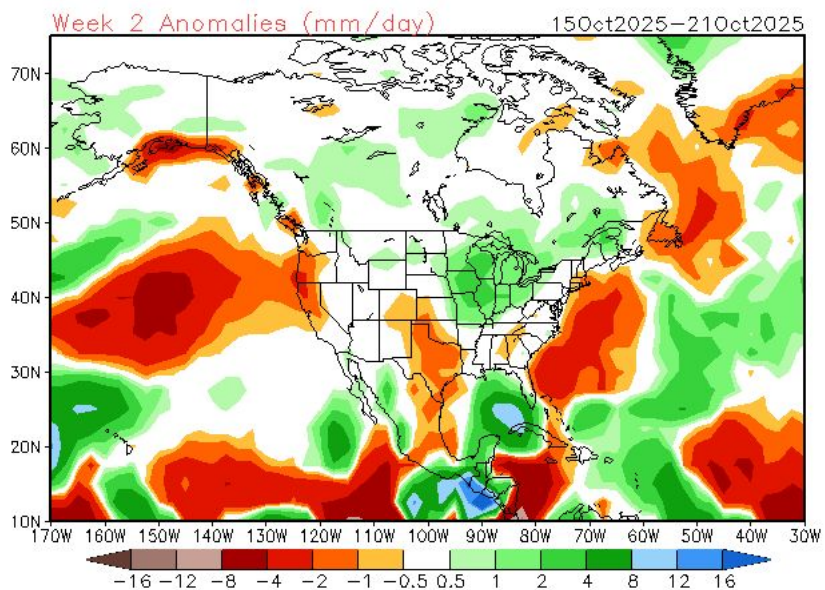
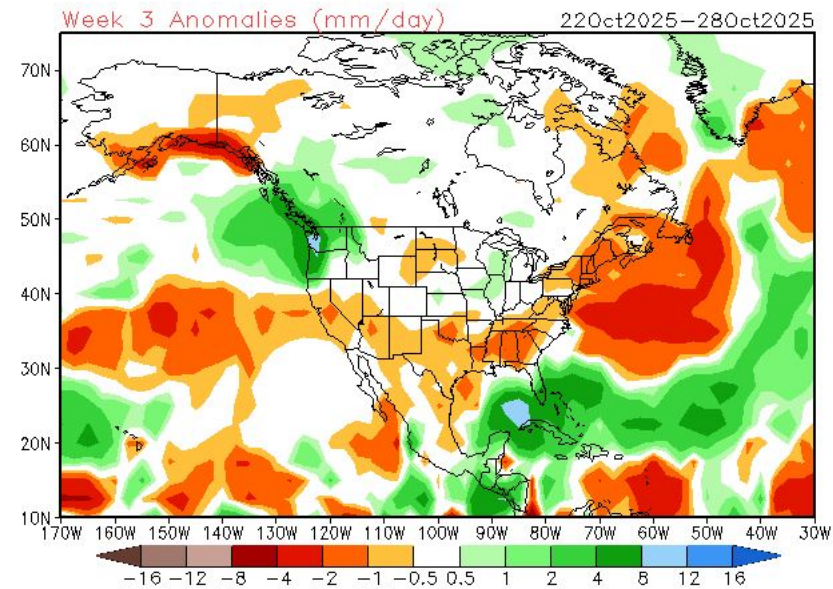
Valid: October 2025
Issued: September 30, 2025



CFSv2 Weeks 1 & 2 Precipitation
16 Member Ensemble Mean Forecast from 07Oct2025



CFSv2 Weeks 3 & 4 Precipitation
16 Member Ensemble Mean Forecast from 07Oct2025

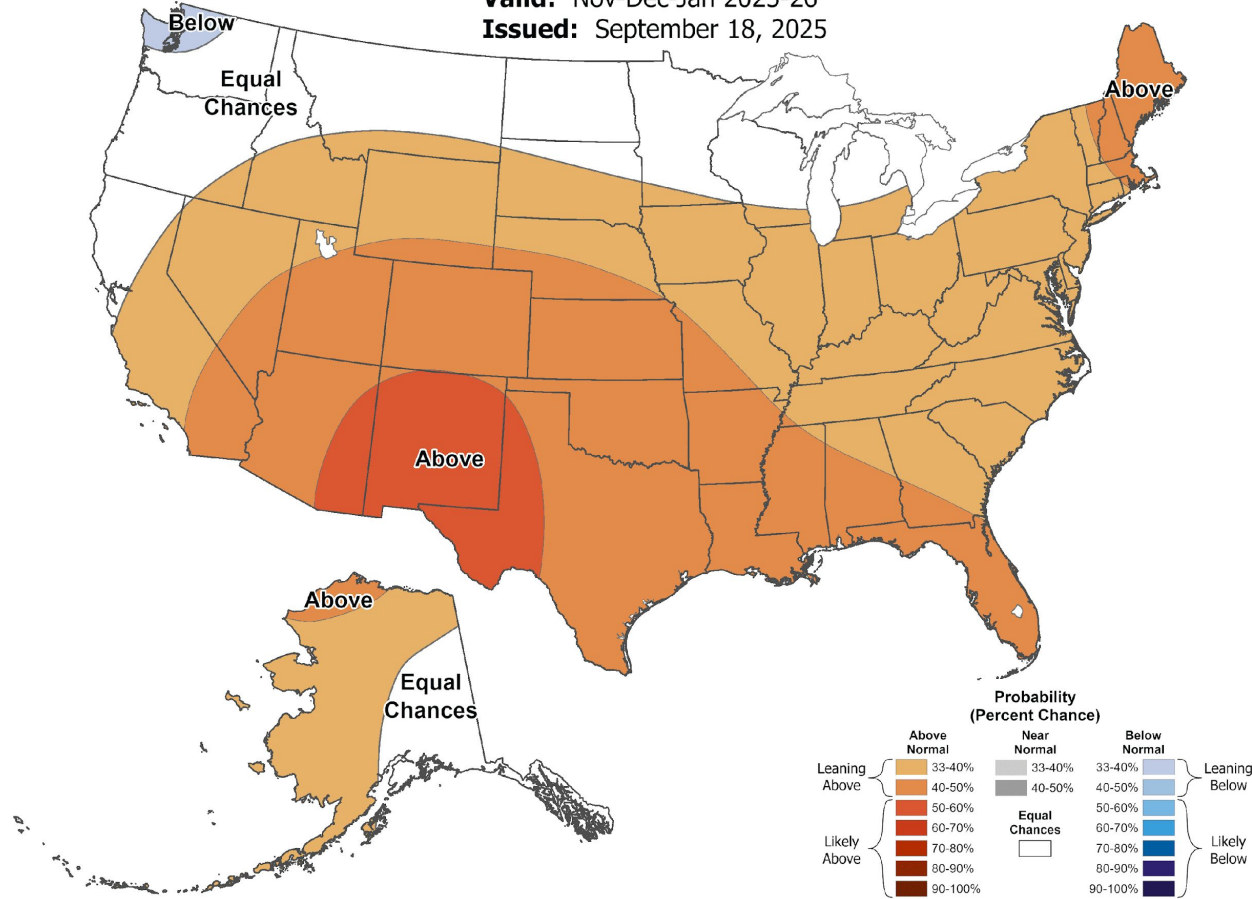


Climate Prediction Center Outlook: Nov-Jan



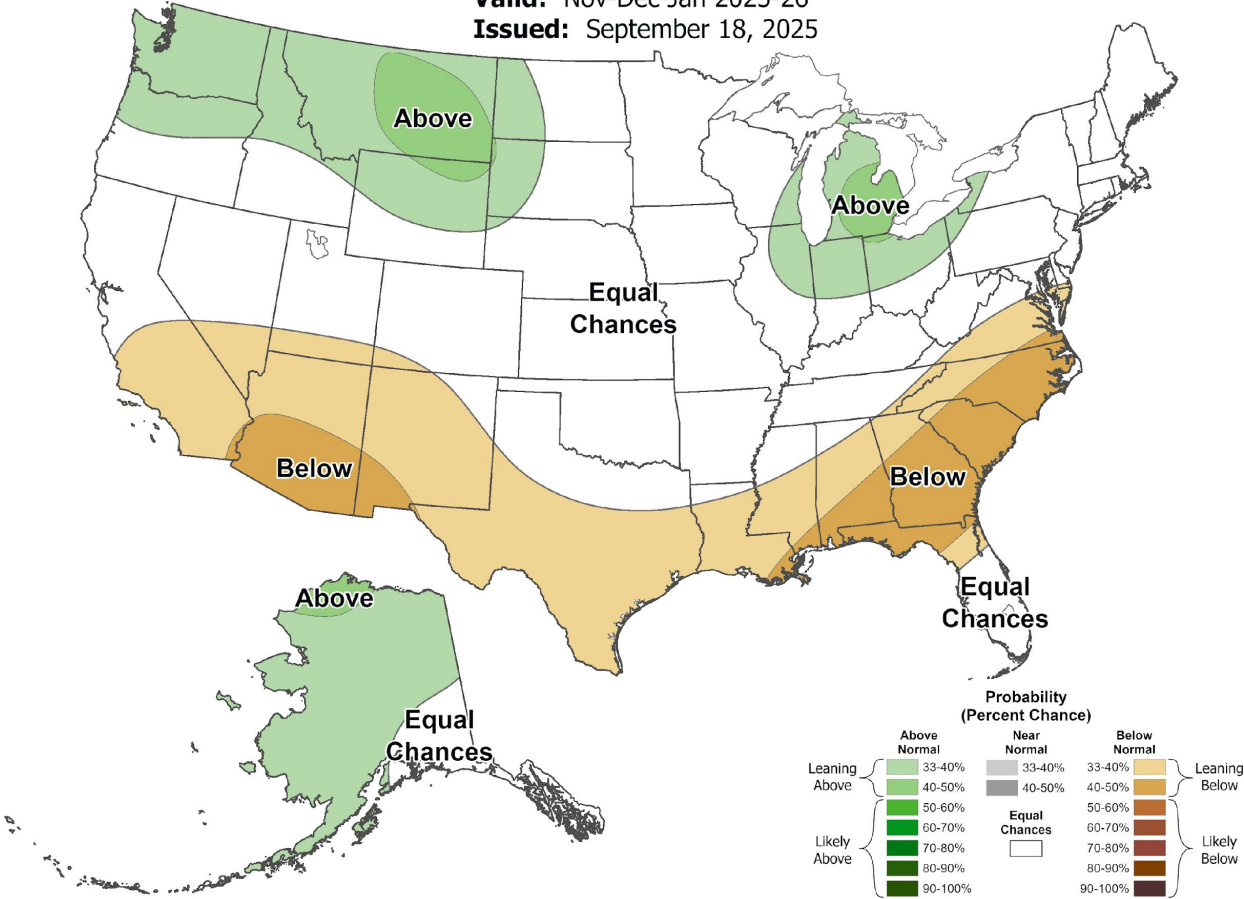
Seasonal Temperature Outlook

Valid: Nov-Dec-Jan 2025-26
Issued: September 18, 2025



Seasonal Precipitation Outlook

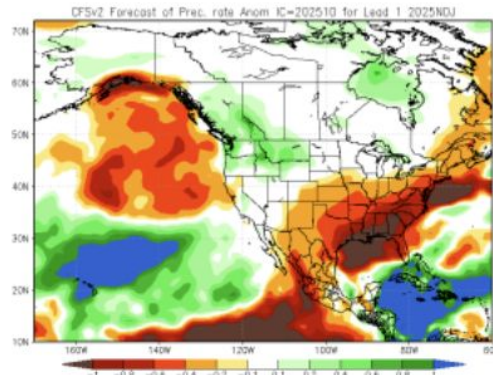
Valid: Nov-Dec-Jan 2025-26
Issued: September 18, 2025



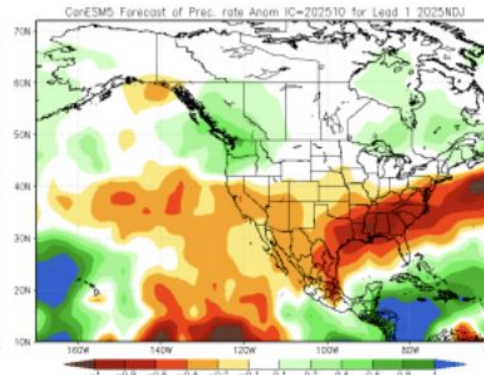
Dec-Feb: Higher odds of below normal temperatures; uncertain on precipitation

National Multi-Model Ensemble: NDJ Precipitation

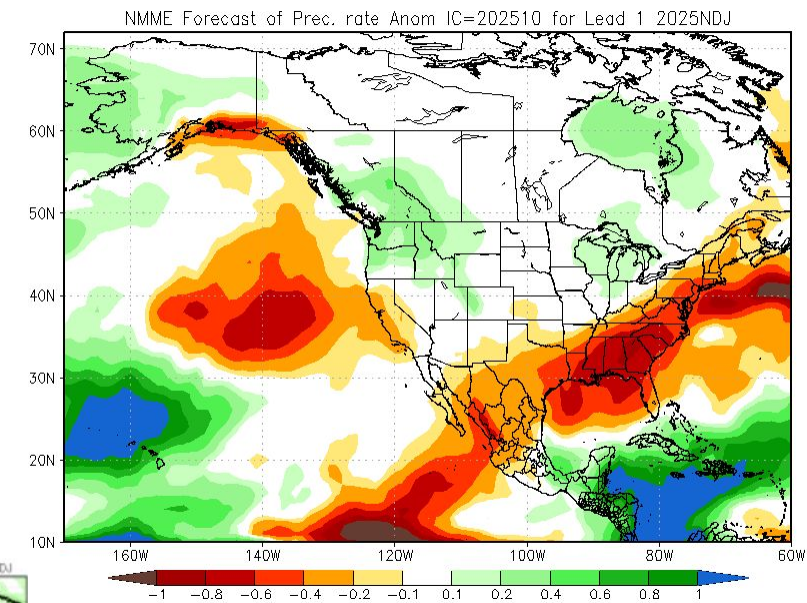
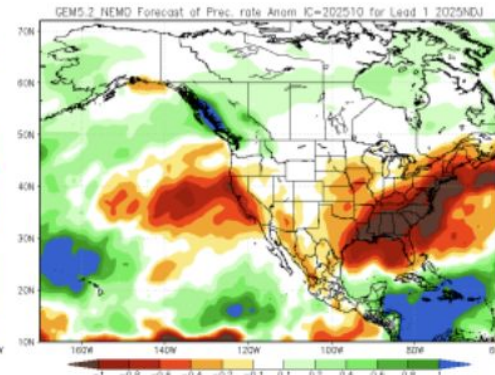
NCEP_CFSv2



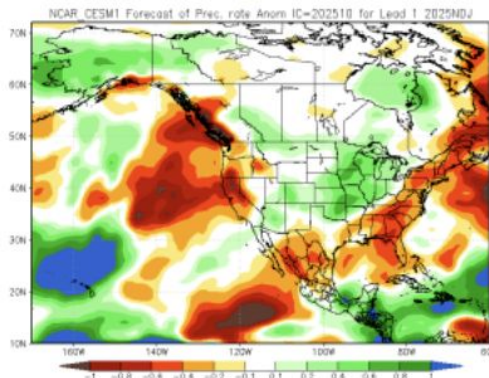
CanESM5



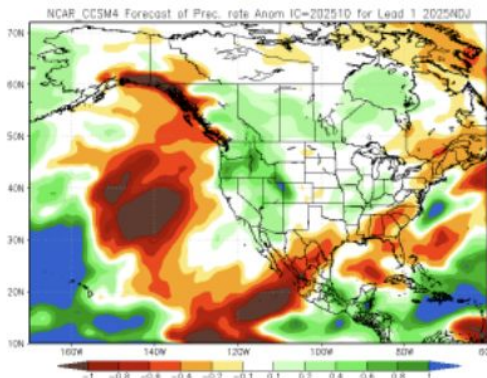
GEM5.2_NEMO



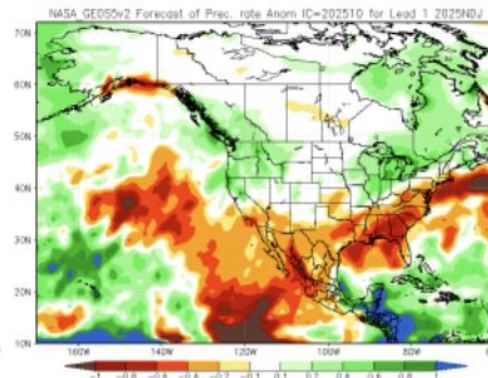
NCAR_CESM1



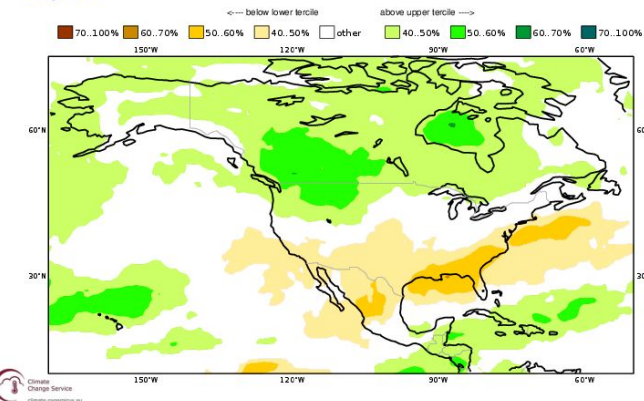
NCAR_CCSM4



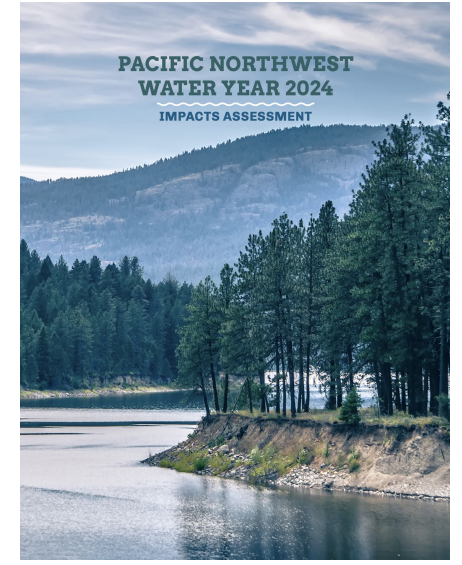
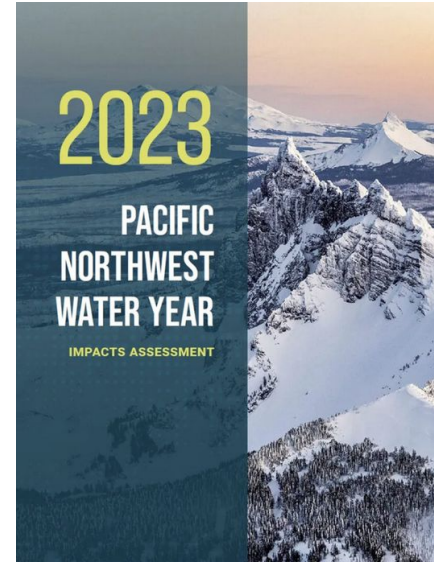
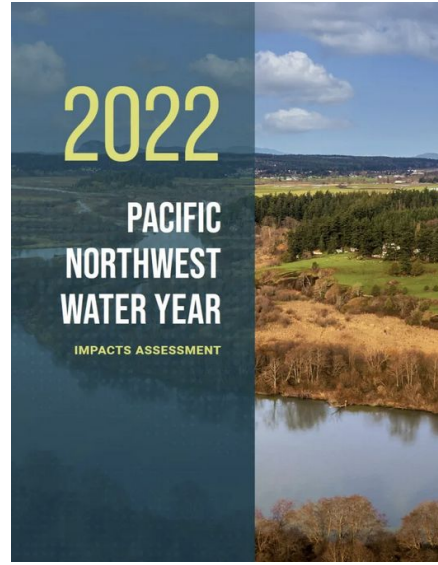
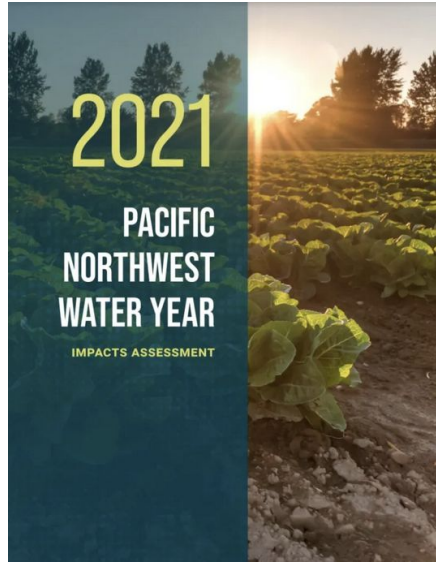
NASA_GEOS5v2



C3S multi-system seasonal forecast ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC/BOM
Prob(most likely category of precipitation)
Nominal forecast start: 01/09/25
Unweighted mean



PNW Water Year 2025 Impacts Survey



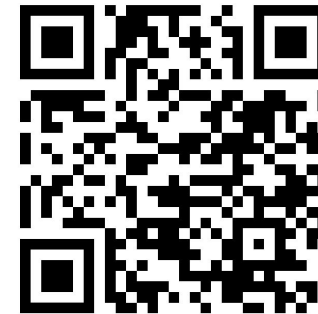
2025

Your Input
Here

Take the
**PNW Water Year
2025 Impacts**

Survey!

(Open through November
26)

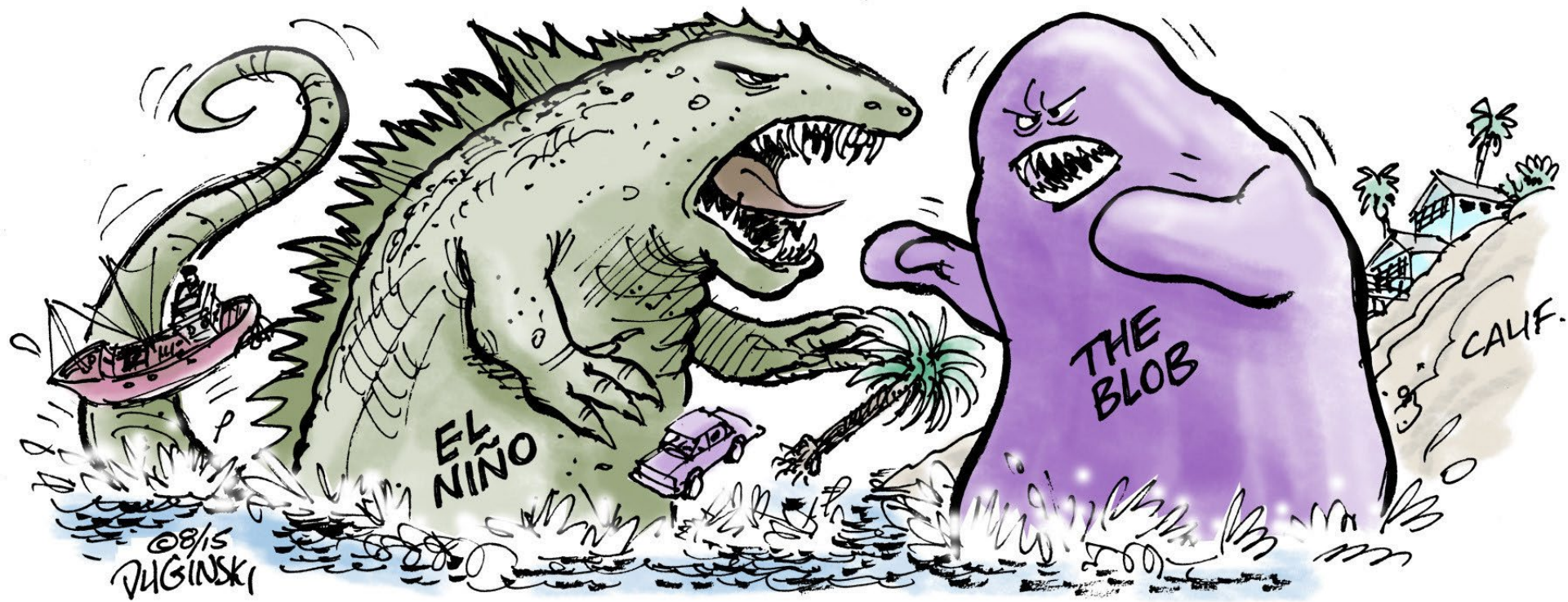


Scan me!

Summary

- Averaged statewide, water year temperatures were above normal (~4th warmest; +1.7°F) and precipitation was below normal (89% of normal)
- July-Sept temperatures were much above normal, particularly in September
 - Drier than normal summer as well, but not as anomalous as temps (exception is above normal precip on parts of the Peninsula)
- Near record low streamflows
- La Niña Advisory issued this morning: weak La Niña expected to persist through Dec-Jan-Feb
- Forecast agreement for above normal precipitation in Nov-Dec-Jan

The Atmosphere-Ocean System in Recent Years from the Media/Public Perspective



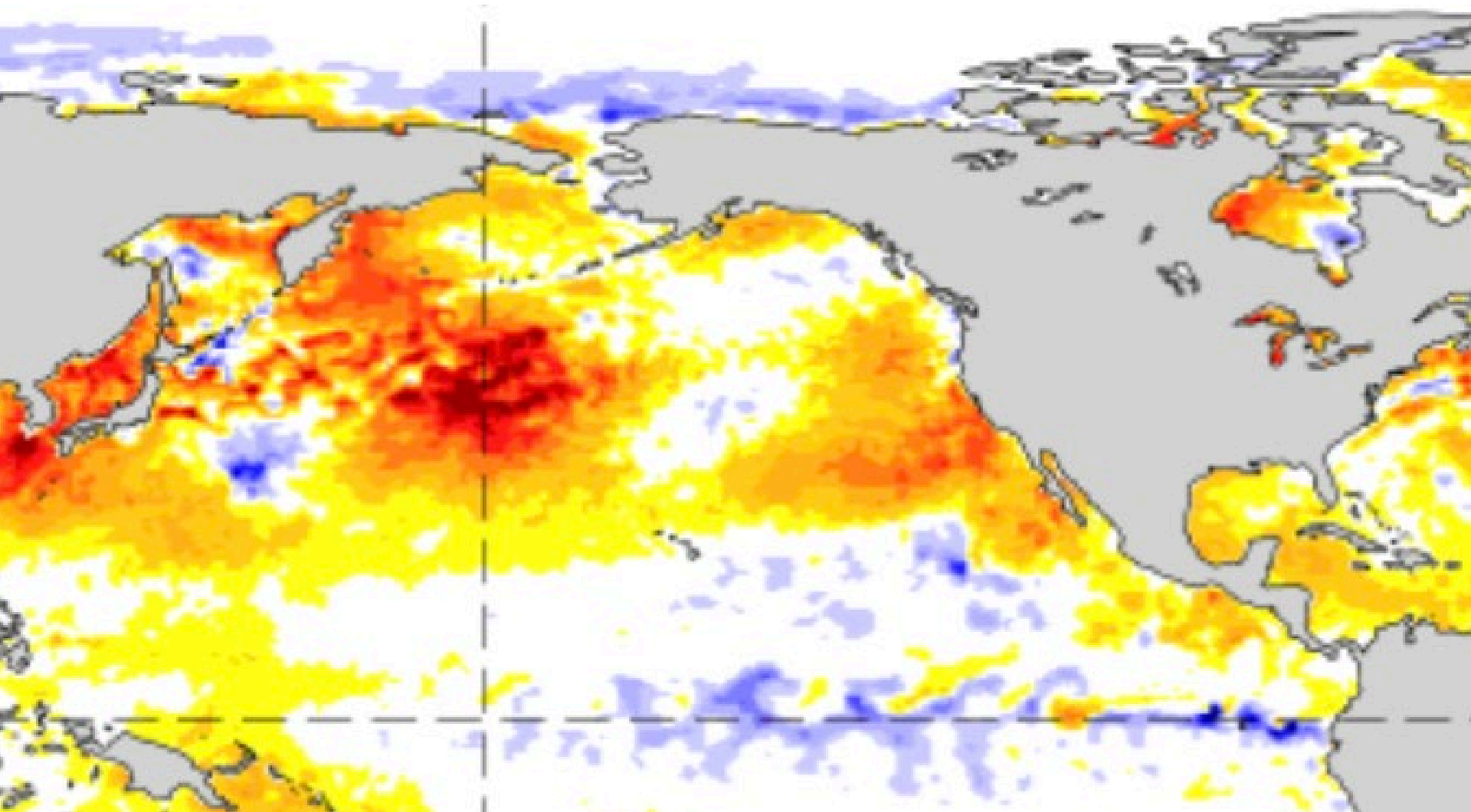


Impacts of NE Pacific SST Anomalies on the Response to ENSO in the Pacific Northwest

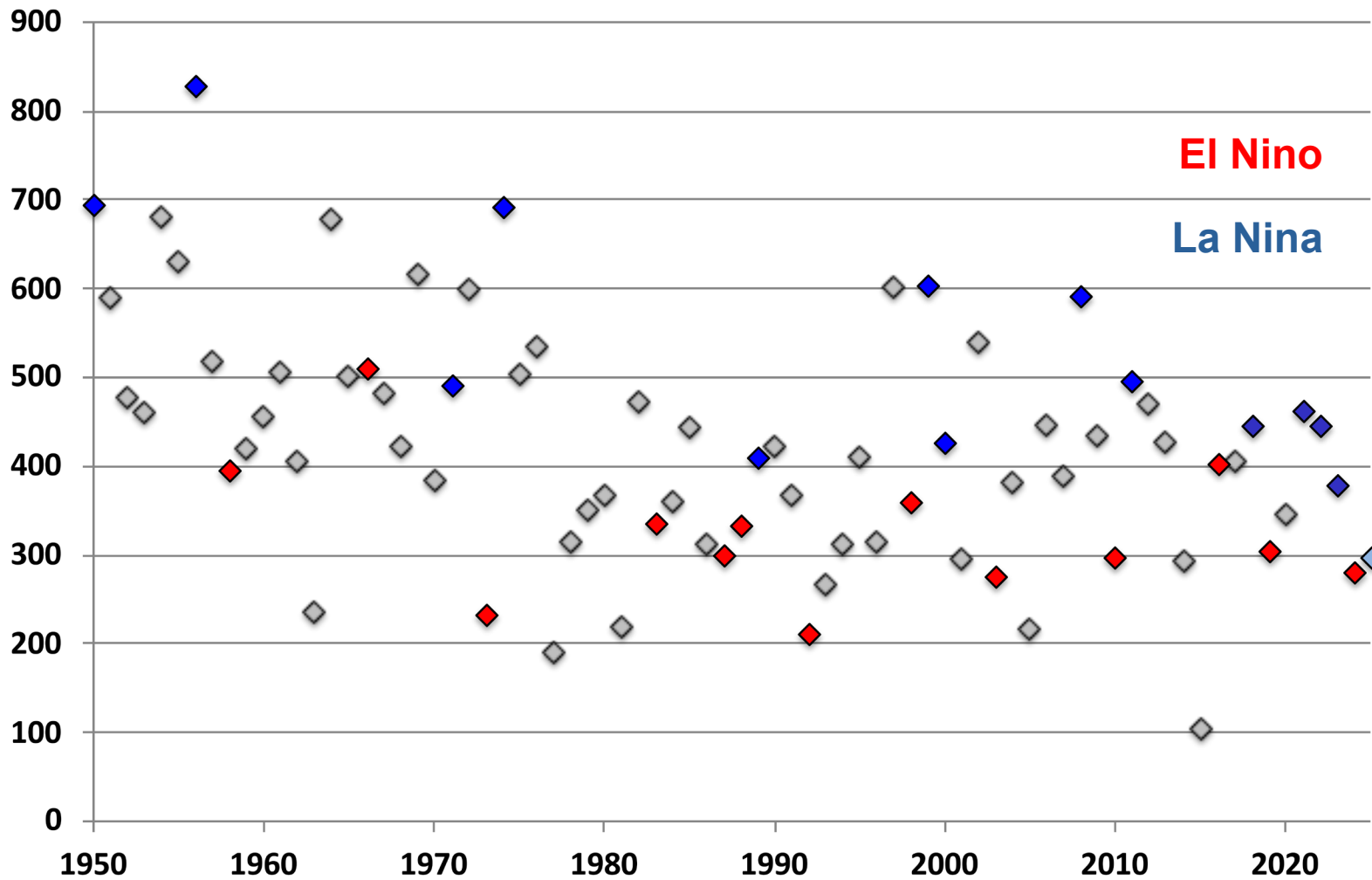
Nick Bond
Washington State Climate Office



Sea Surface Temperature (SST) Anomalies – 1 October 2025



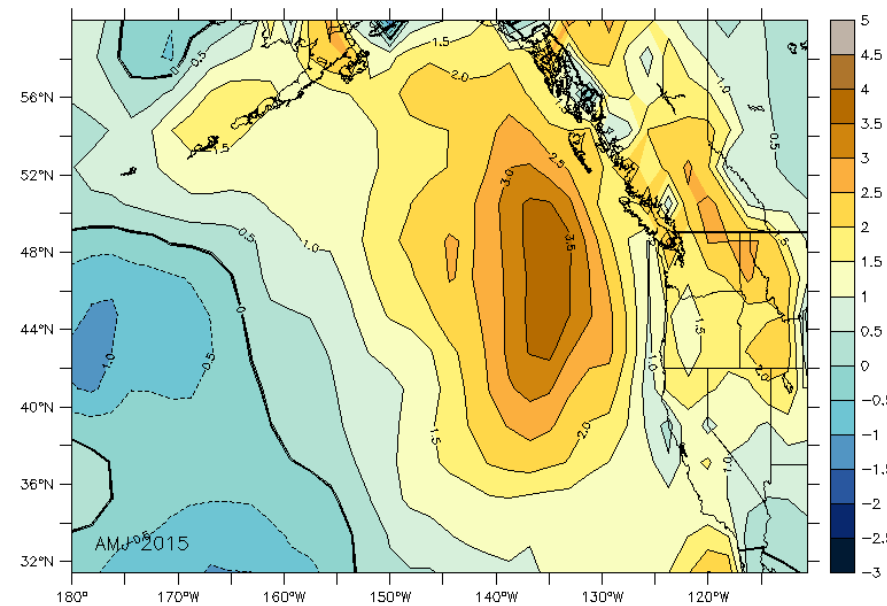
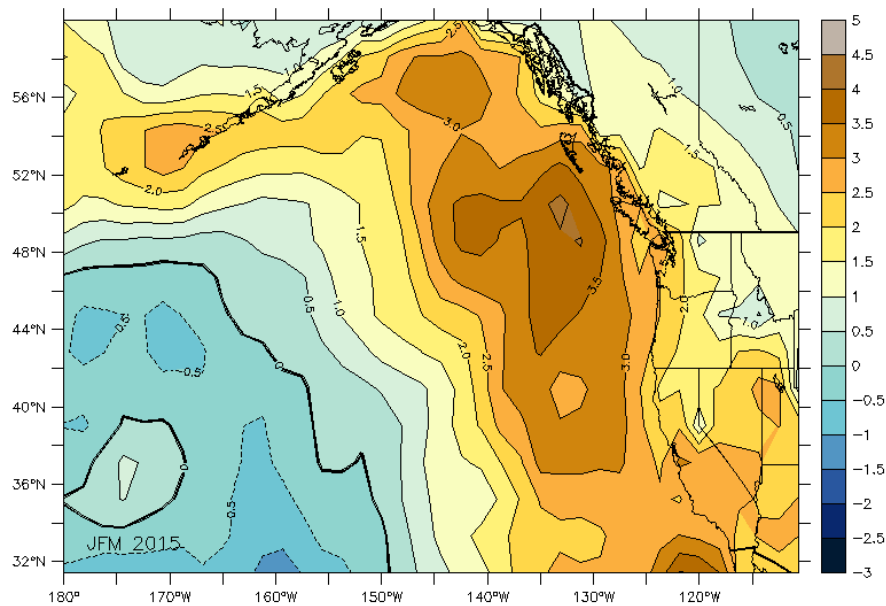
Total Winter Snowfall (inches) at Snoqualmie Pass (3022 feet)



Jan-Mar

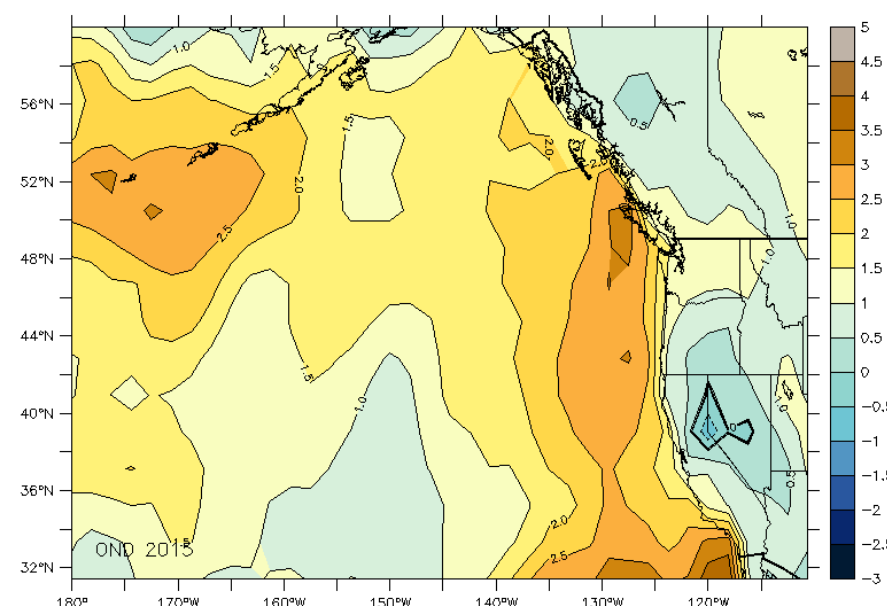
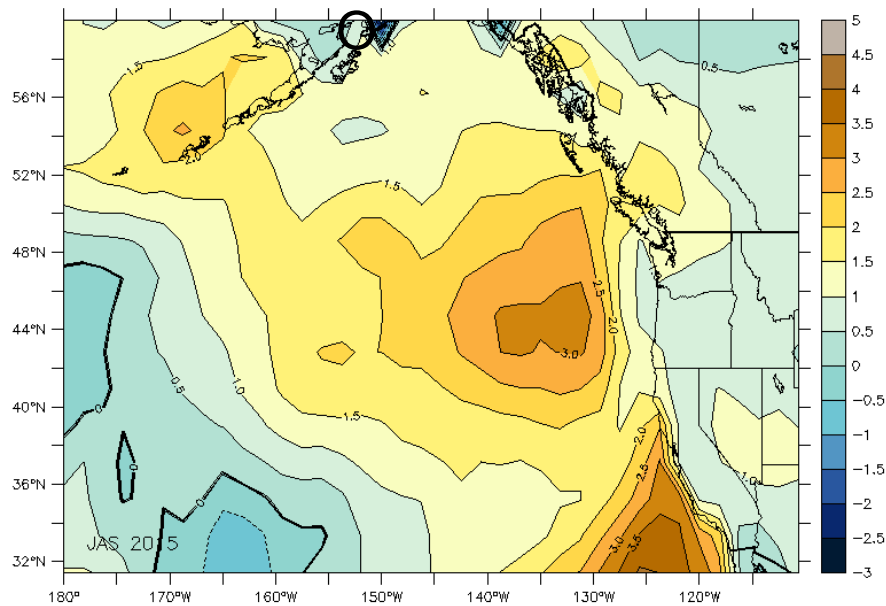
2015

Apr-Jun



Jun-Sep

Oct-Dec

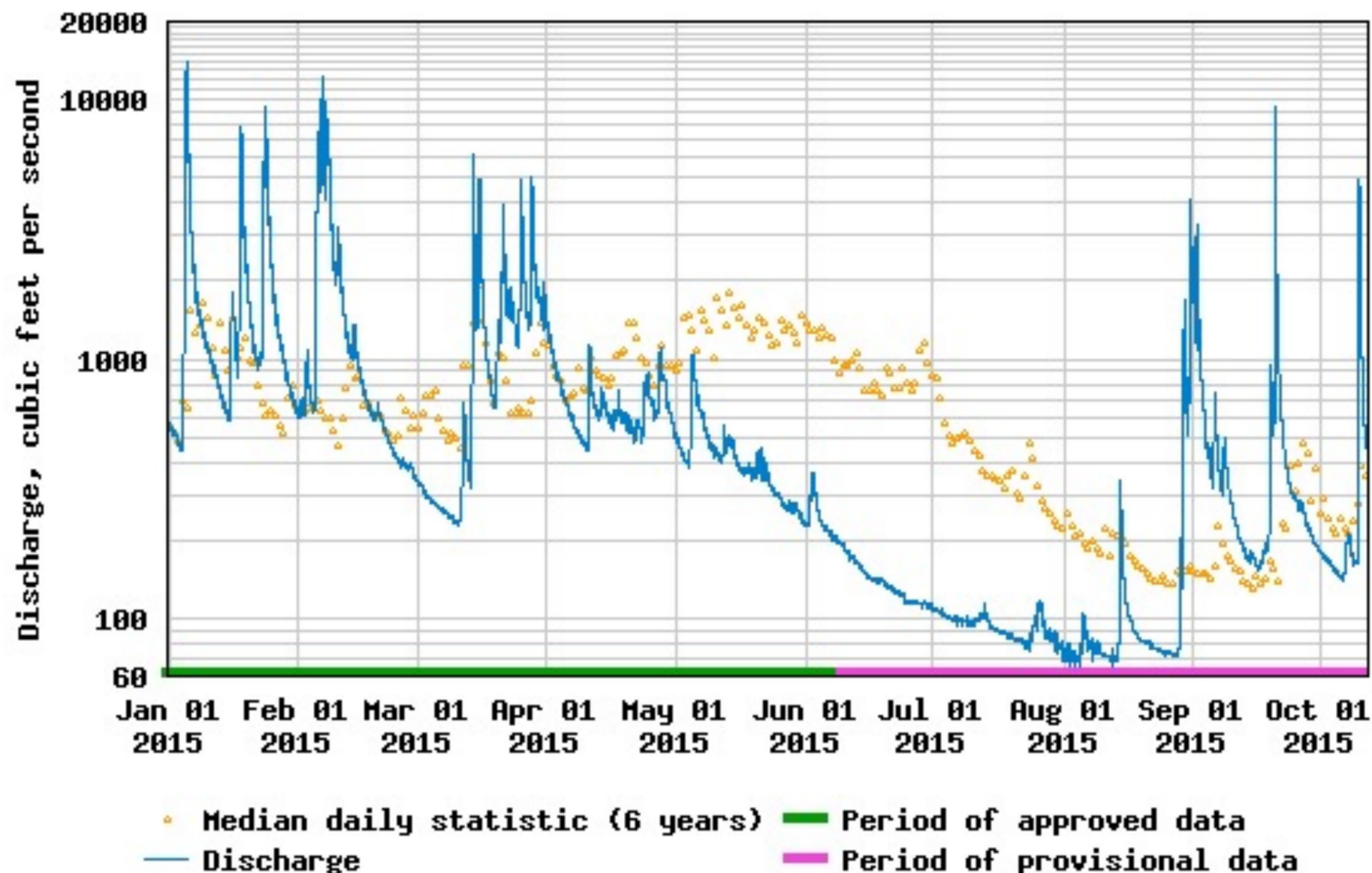


Winter of 2014-15



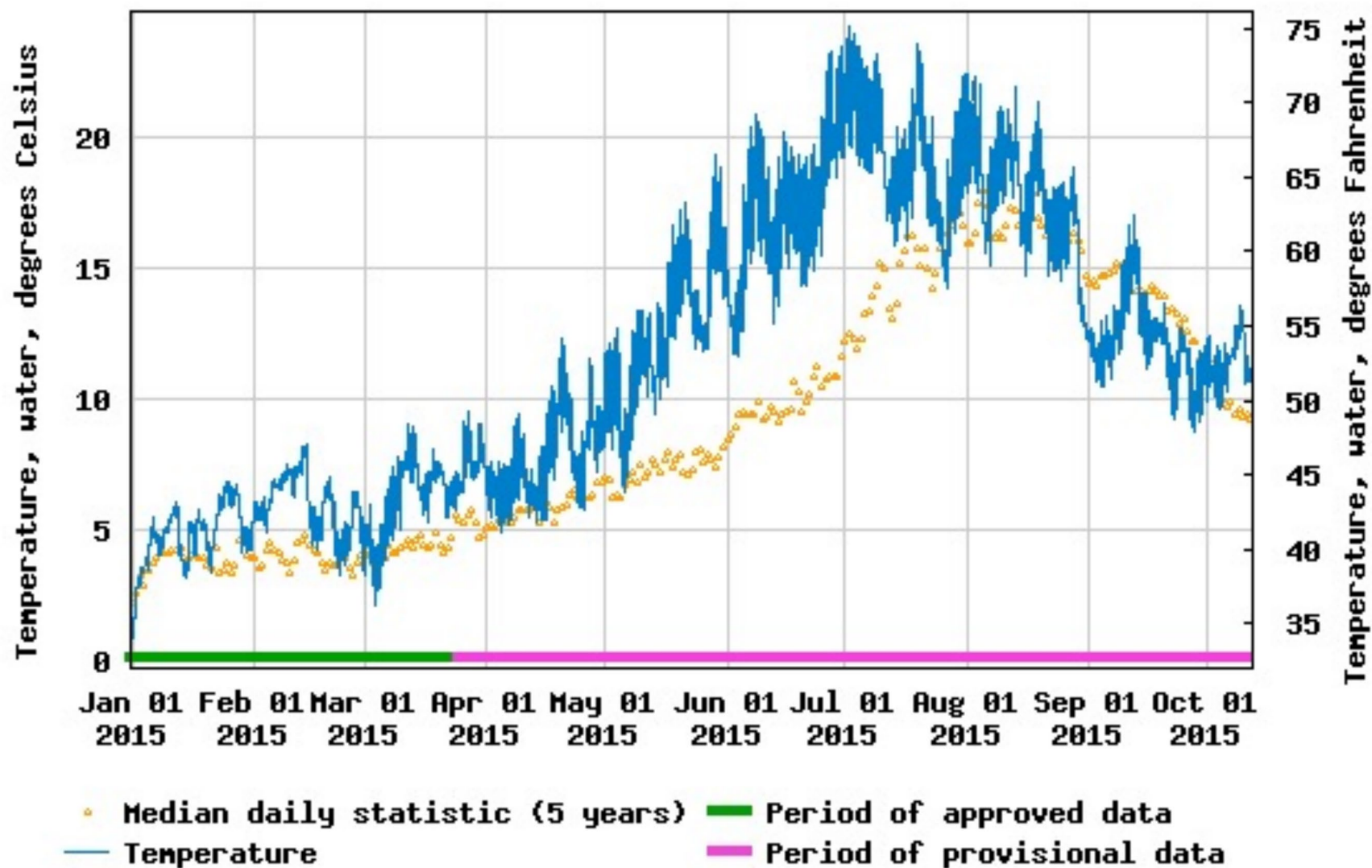
Capital Press - March 2015

USGS 12210000 SF NOOKSACK RIVER AT SAXON BRIDGE, WA





USGS 12210000 SF NOOKSACK RIVER AT SAXON BRIDGE, WA





The Mouth of the White Salmon River

July 2015

*Northwest Power
and Conservation
Council*

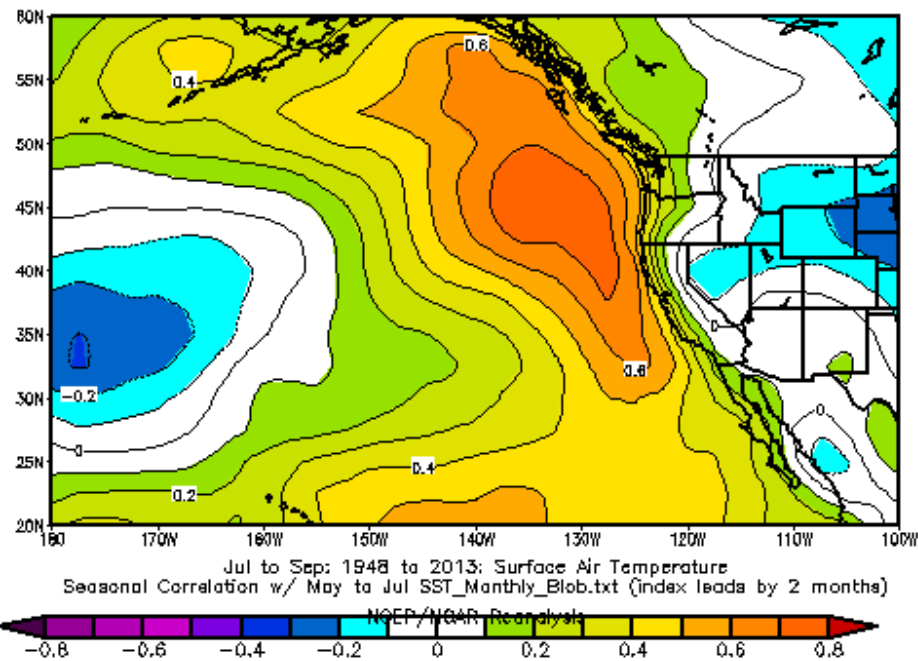
Seasonal Weather in the Pacific NW

1. To what extent does the weather of the Pac NW depend on regional ocean temperatures?
2. What are the combined effects of ENSO and regional ocean temperatures?
3. What are the relative magnitudes of the signals with respect to air temperature and precipitation?
4. How does the predictability related to ocean conditions vary seasonally?

How far inland do the thermodynamic effects of SST anomalies extend?

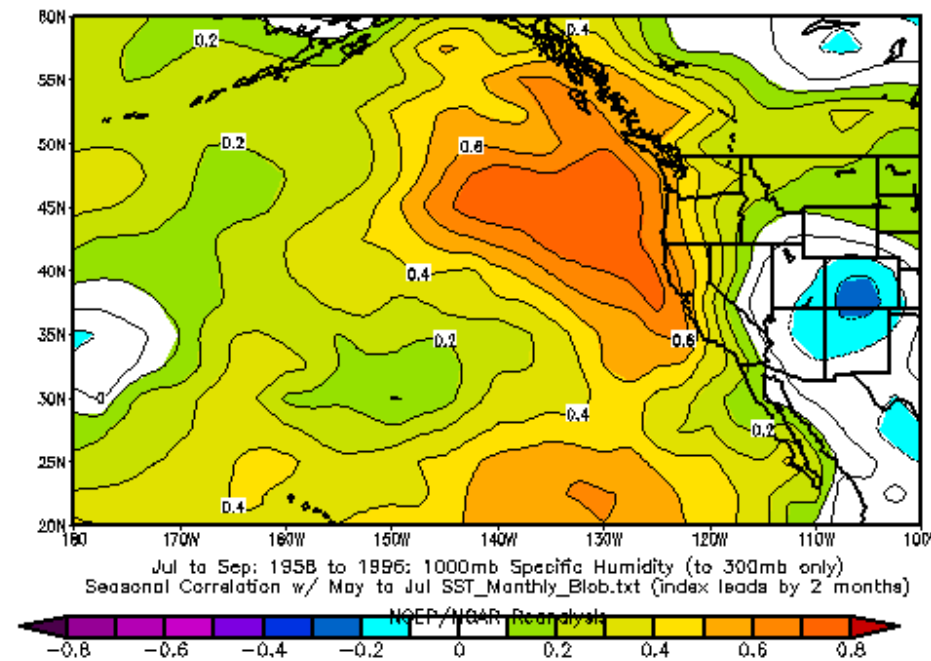
SST Index vs. Surface Air T

(SST Index leads by 2 months)



NOAA/ESRL Physical Sciences Division

SST Index vs. 1000 hPa Humidity



NOAA/ESRL Physical Sciences Division

Generalized Additive Model (GAM)

- Akin to multiple linear regression

$$Y = b_0 + f_1(x_1) + \dots + f_m(x_m)$$

- Relaxes requirement of linear relationships between predictors and predictand; seeks balance between model simplicity and fit
- Results readily interpreted
- Commonly used in social and biological studies
- Easy to implement using R

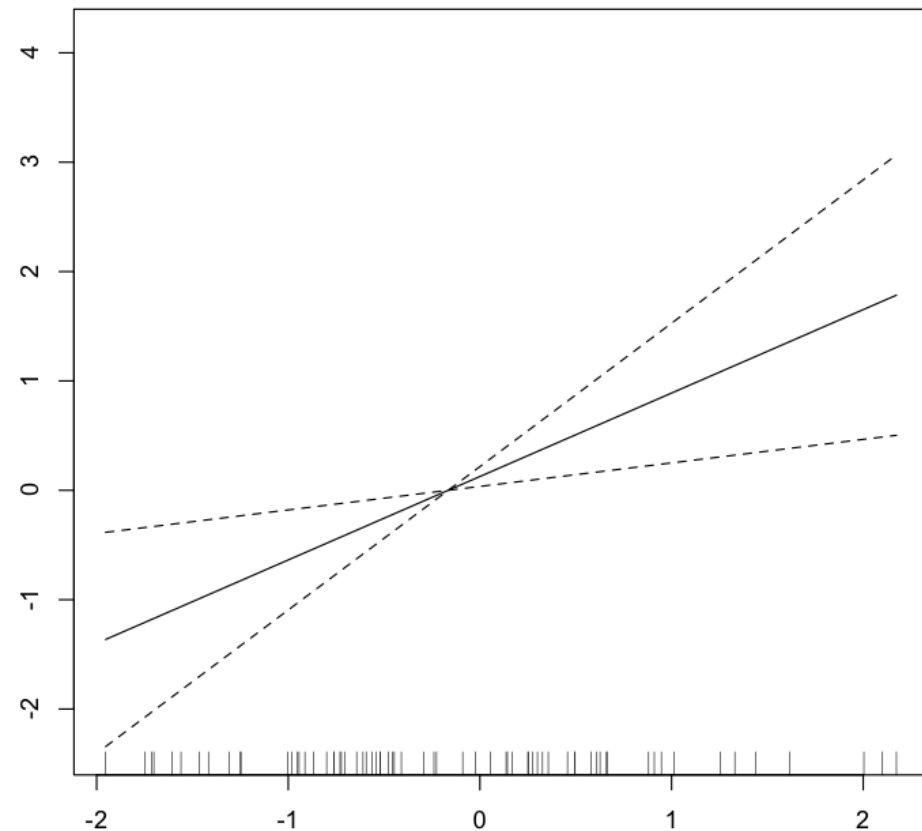
Variables Considered

(Seasonal and Statewide Means)

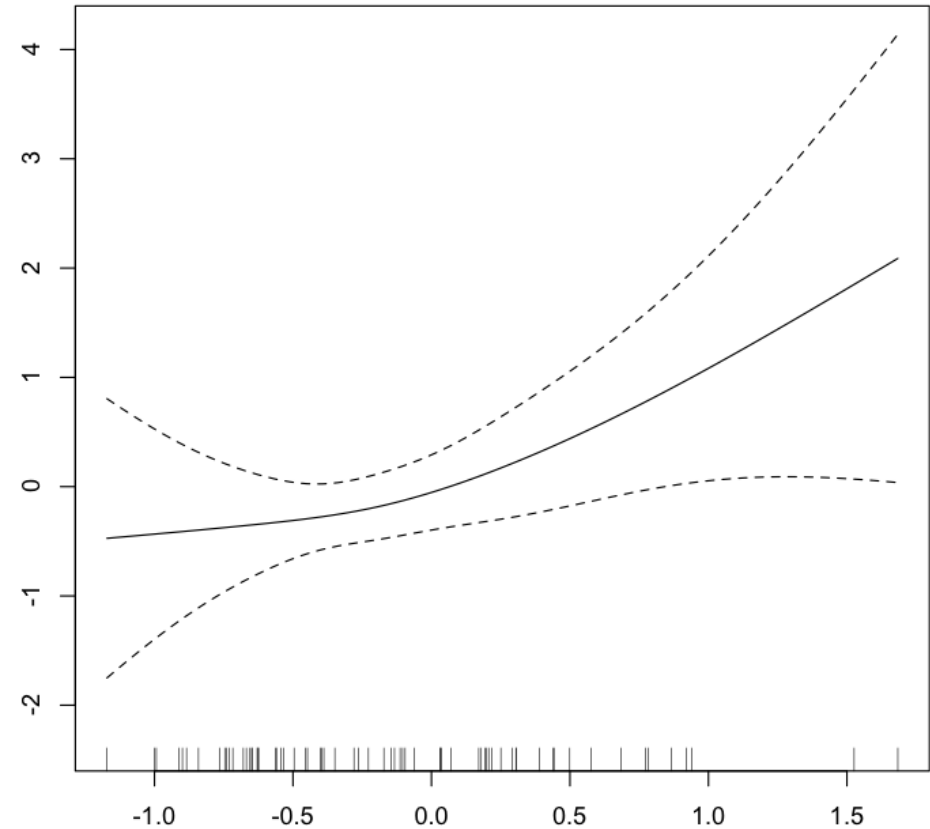
- **Average T_A (Based on Station Data)**
- **Total Precipitation**
- NINO3.4
- SST (40-50 N, 140-125 W)
- PDO
- Indices (NPI, PNA, EP-NP)
- 925 hPa q (specific humidity)
- 925 hPa T
- 700 hPa Ω (vertical velocity)

Examples of Fitted Functions from a GAM

WA DJF Air Temperature – NINO3.4 & Regional SST



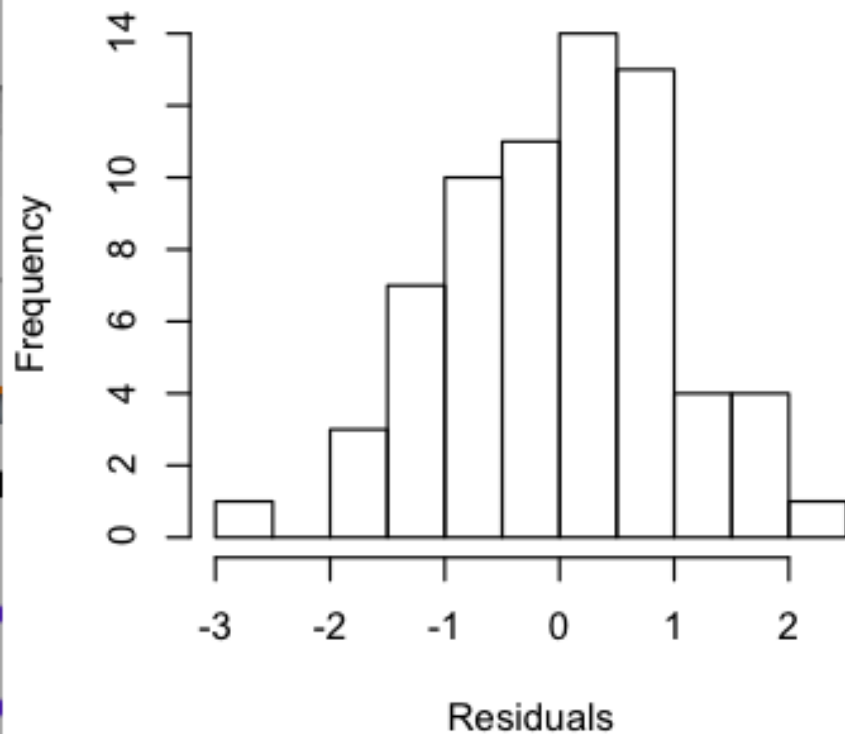
NINO3.4



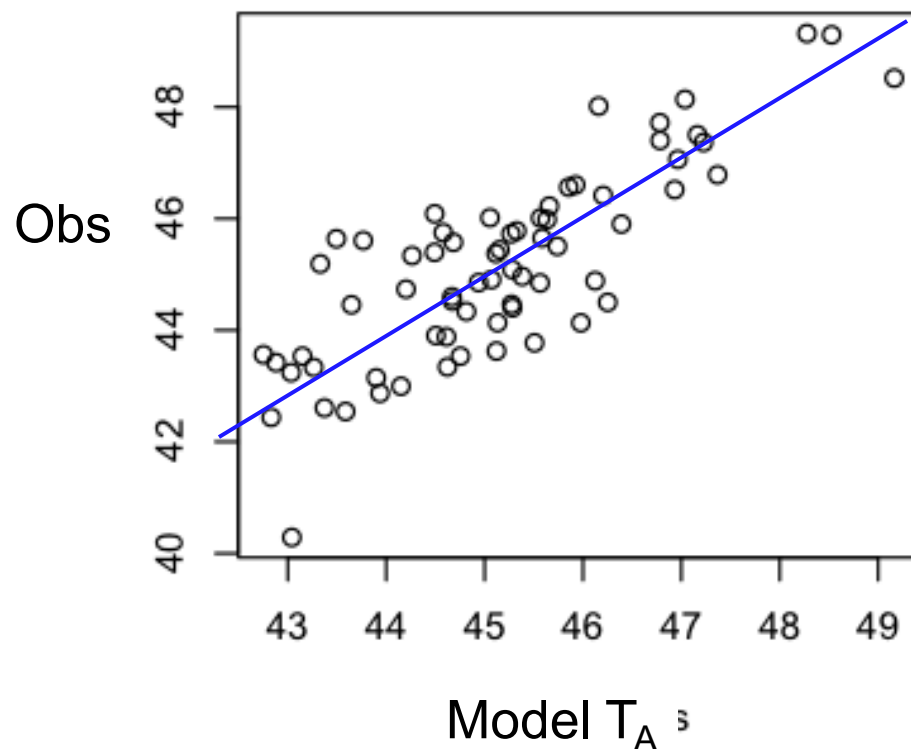
Regional SST

Performance of GAM for WA Spring Air Temperatures with NINO3.4 and Regional SST as Predictors

Histogram of residuals



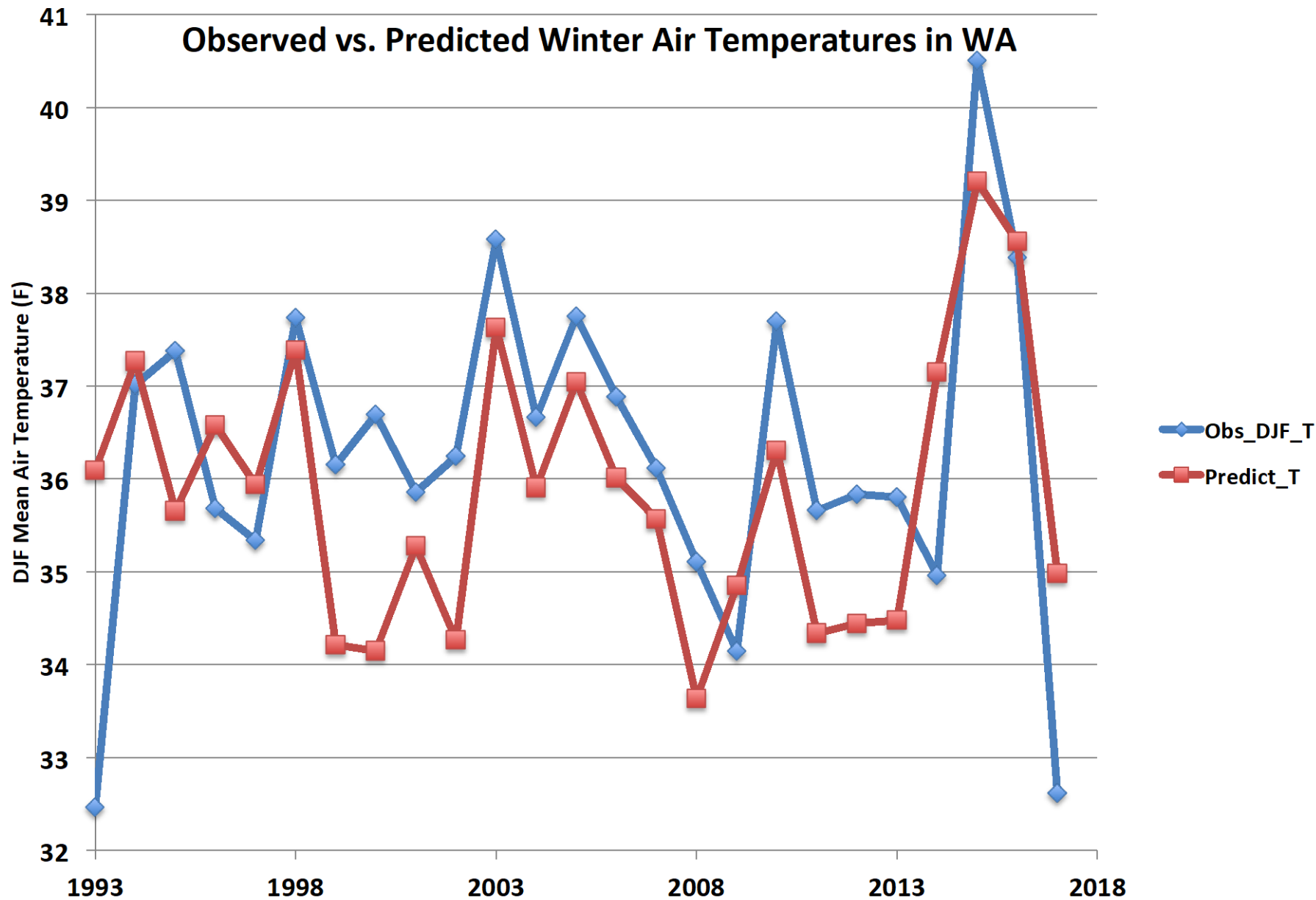
Response vs. Fitted Values



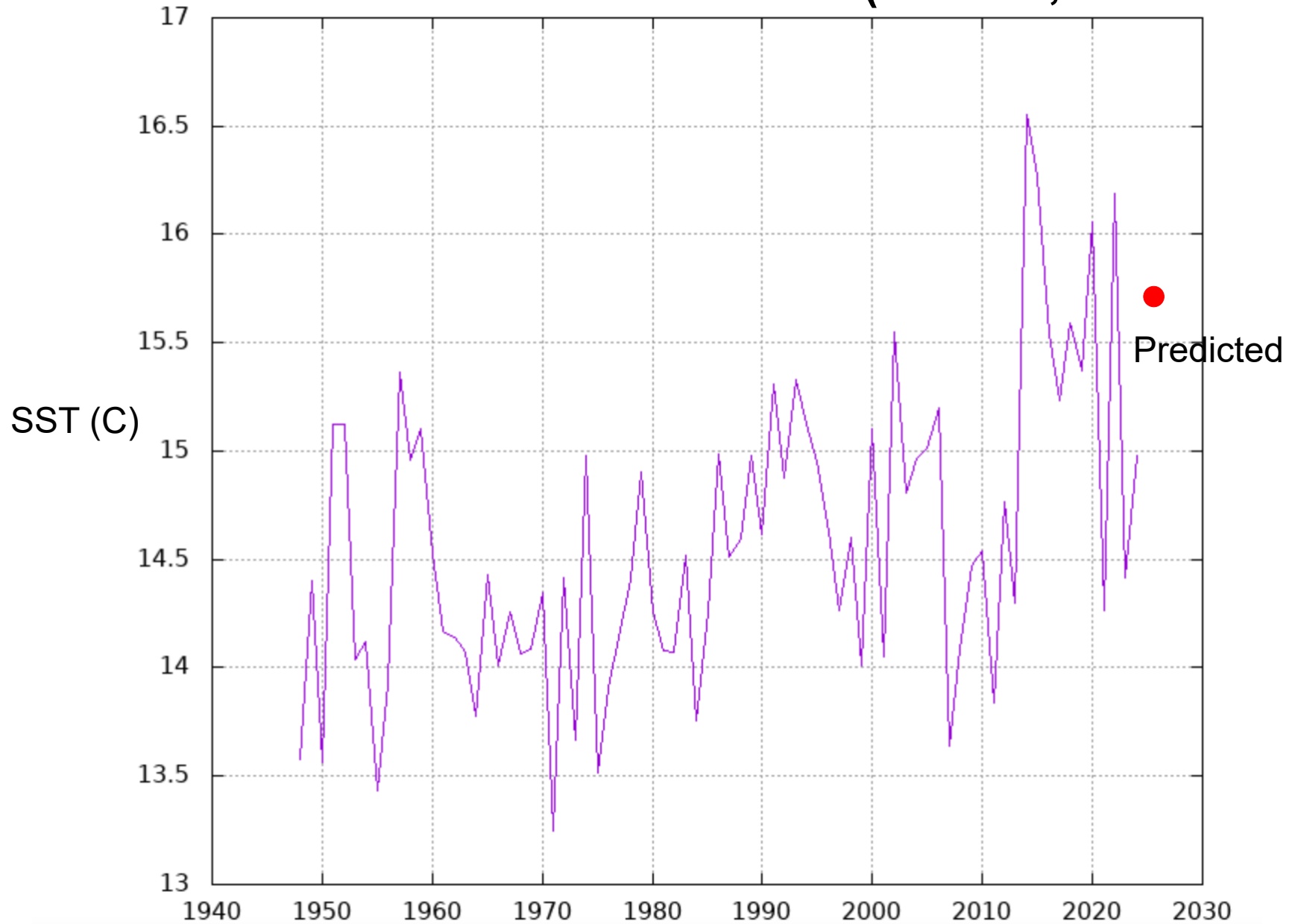
Mean T_A Models

- A. Winter (DJF): NINO3.4 & PDO (0.33)**
- A. Winter (DJF): NINO3.4 & Regional SST (0.28)**
- A. Spring (MAM): NINO3.4 & Regional SST (0.66)**
- A. Summer (JJA): NINO3.4 & Regional SST (0.38)**
- A. Fall (SON): NINO3.4 & Regional SST (0.18)**

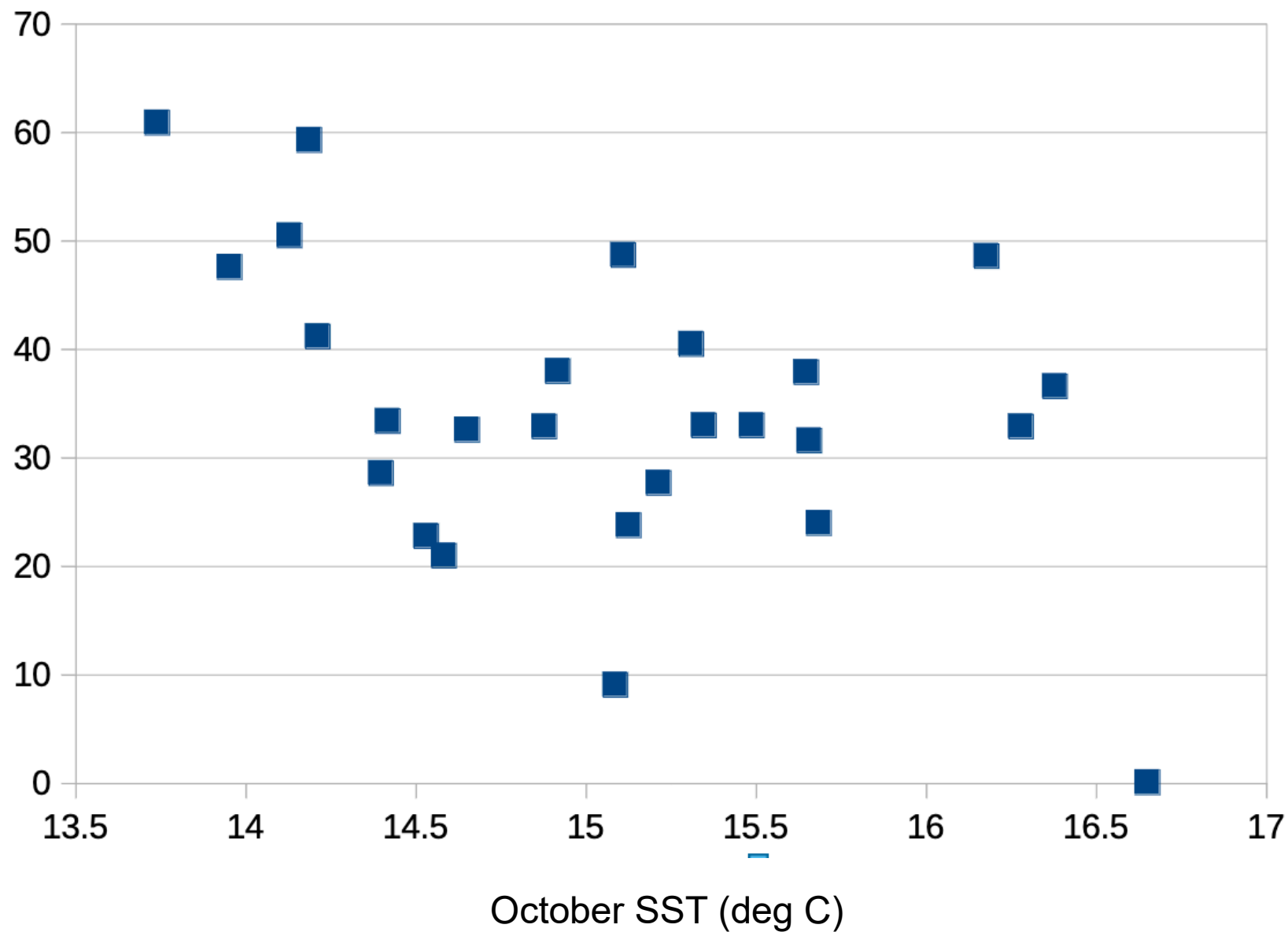
Observed vs. Predicted Winter Air Temperatures in WA



October SST off the PNW Coast (40-50 N, 140-125 W)



Stampede Pass
1 April SWE (in.)



El Nino

La Nina

2024-25

Predicted SST

2014-15



Skill of Seasonal Weather Forecasts for WA State from NOAA's Climate Prediction Center (CPC)

Compiled by OWSC for inclusion in "Washington State Drought Contingency Plan, 2017"

Table 1 The HSS for 0.5/3.5-month lead times (1995-2015) for WA State. The bolded HSS scores are considered to have meaningful forecast skill while the red HSS scores lack skill.

<u>Heidke Skill Scores</u>	Temperature		Precipitation	
	0.5-month lead	3.5-month lead	0.5-month lead	3.5-month lead
Oct-Dec	-1.5	1.0	-7.5	6.5
Jan-Mar	38.1	24.0	7.6	22.5
Apr-Jun	22.5	21.5	-1.5	3.5
Jul-Sep	30.0	31.0	25.0	17.5

Final Remarks

- Seasonal mean temperatures in the Pacific NW are influenced by regional SSTs.
- Simple empirical models with NINO3.4 and a regional SST index as predictors explain a considerable fraction of the variance in seasonal mean temperatures, but not precipitation.
- The effects of ENSO and regional SST appear to be strongest in spring and weakest in fall.