



WASHINGTON
STATE CLIMATE OFFICE

It's Not Just Rain: What Causes Drought in Washington and How You Can Get Involved

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Washington State Climate Office, Climate Impacts Group
University of Washington

October 7, 2026



EARTHLAB
UNIVERSITY of WASHINGTON

01 Drought in Washington

02 How You Can Help Us Understand Drought

03 The Future of Drought in Washington

04 El Niño and Seasonal Outlooks

Drought in Washington

What is Drought?

WHAT ARE THE 5 TYPES OF DROUGHT ?



METEOROLOGICAL

drought refers to an extended period of dry weather patterns.



HYDROLOGICAL

drought refers to low water supply in our rivers, lakes, aquifers, and other reservoirs that often follows meteorological drought.



AGRICULTURAL

drought occurs when a water shortage significantly damages or destroys agricultural crops.



ECOLOGICAL

drought is the most recently defined type of drought and refers to widespread ecological damage caused by the lack of soil moisture.



SOCIOECONOMIC

drought refers to when a water shortage affects the supply and demand of drought commodities, such as water, food grains, and fish.



Nevada Division
of Water Resources

- No single way to measure WA drought
- Drought is “insufficient water to meet needs”; Redmond 2002

- Dry Winter (e.g., 1976-77, 2000-01) impacting snowpack
- Warm winter (e.g., 2004-05, 2014-15) impacting snowpack
- Dry spring (e.g., 2021) and summer (e.g., 2003)

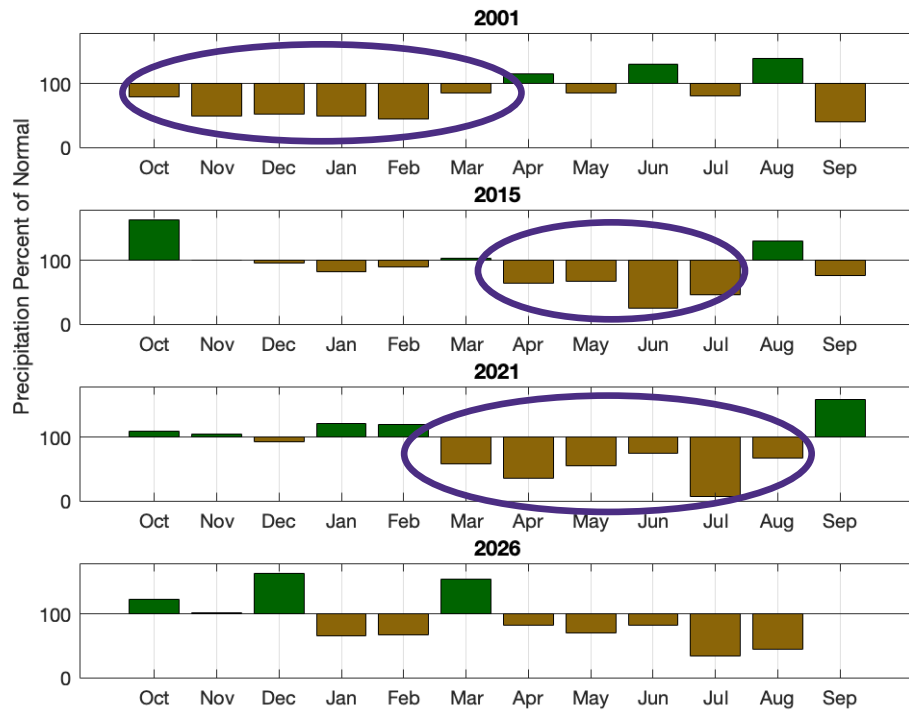
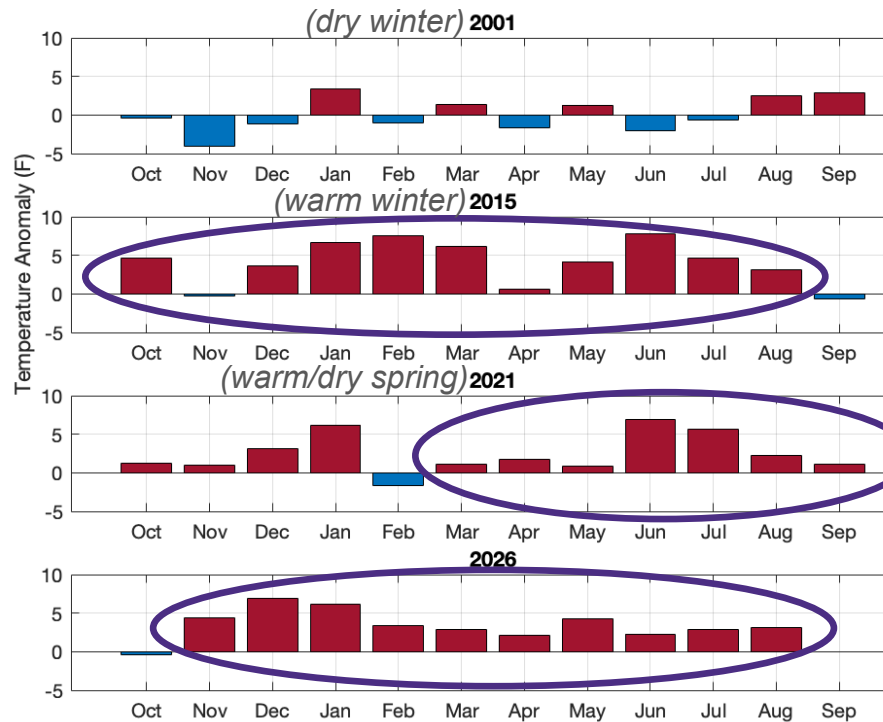


Golden delicious apples shriveled on the tree to prioritize water supply for higher value crops in 2015
(Kate Prengaman, Yakima Herald)

Historical Droughts



WA Statewide



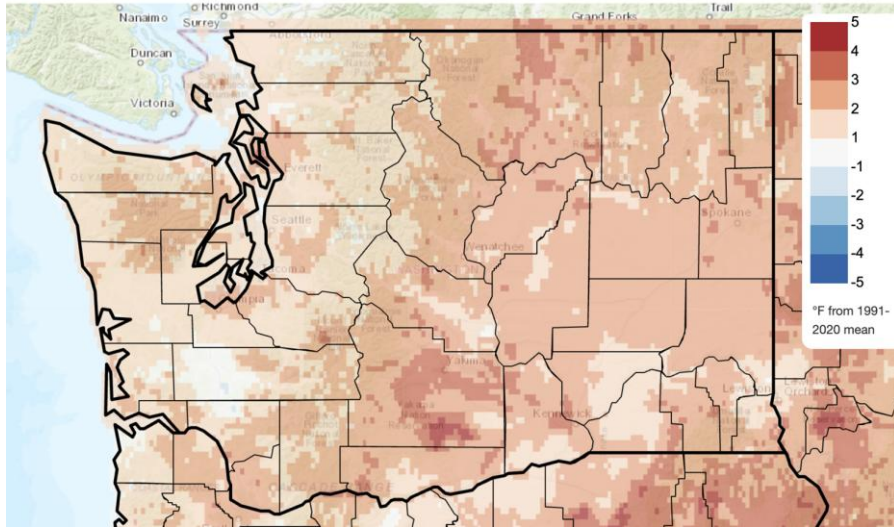
Anomalies compared to 1901-2000 average

Water Year 2026

Temperature

Mean Daily Temperature Anomaly, Since Oct 1st

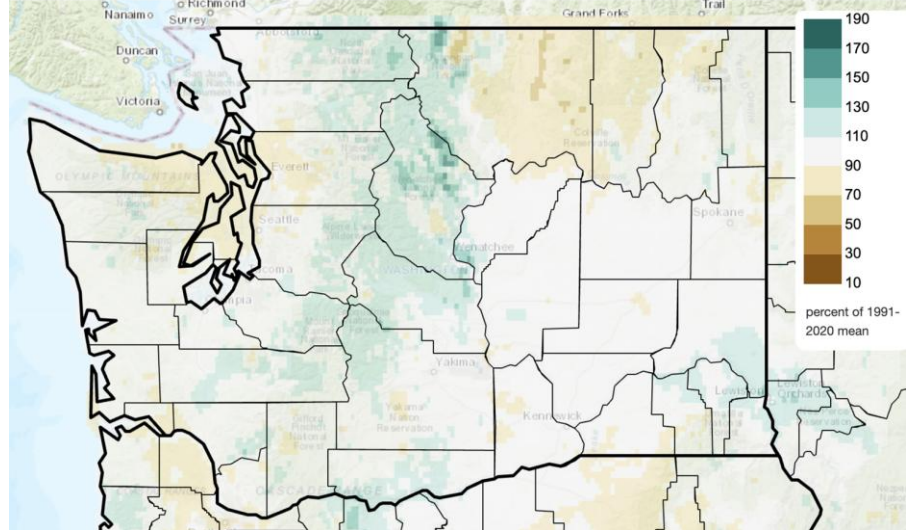
2025/10/01 - 2026/09/28



Precipitation

Total Precipitation Anomaly, Since Oct 1st

2025/10/01 - 2026/09/28

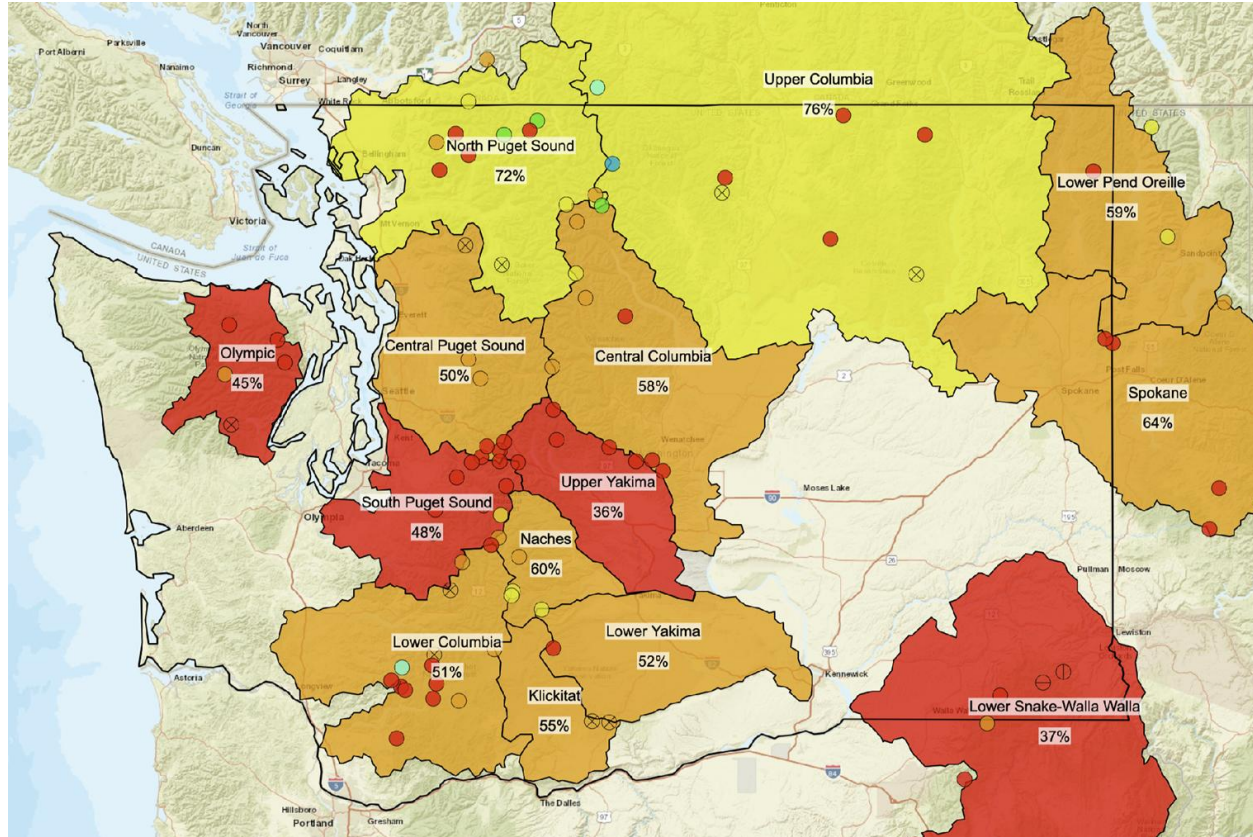


- Averaged statewide, Oct-Aug tied 1992 as the 3rd warmest (+2.4°F) on record*
- Averaged statewide, Oct-Aug precipitation was near-normal (99% of normal)

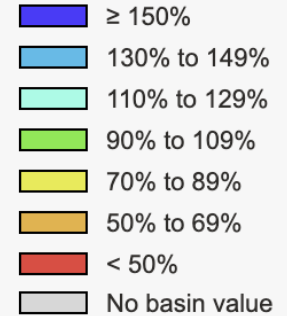
Extremely Low Spring 2026 Snowpack

Basin Percent of Median Snow Water Equivalent: April 1, 2026

**2026 Statewide
Snowpack:
52% of median**



**Snow Water Equivalent
Percent NRCS
1991-2020 Median
April 1, 2026, end of day**



⊖ Observation Missing
⊕ Median is zero
⊗ Median missing

Watershed Boundaries

— State Watersheds

Political Boundaries

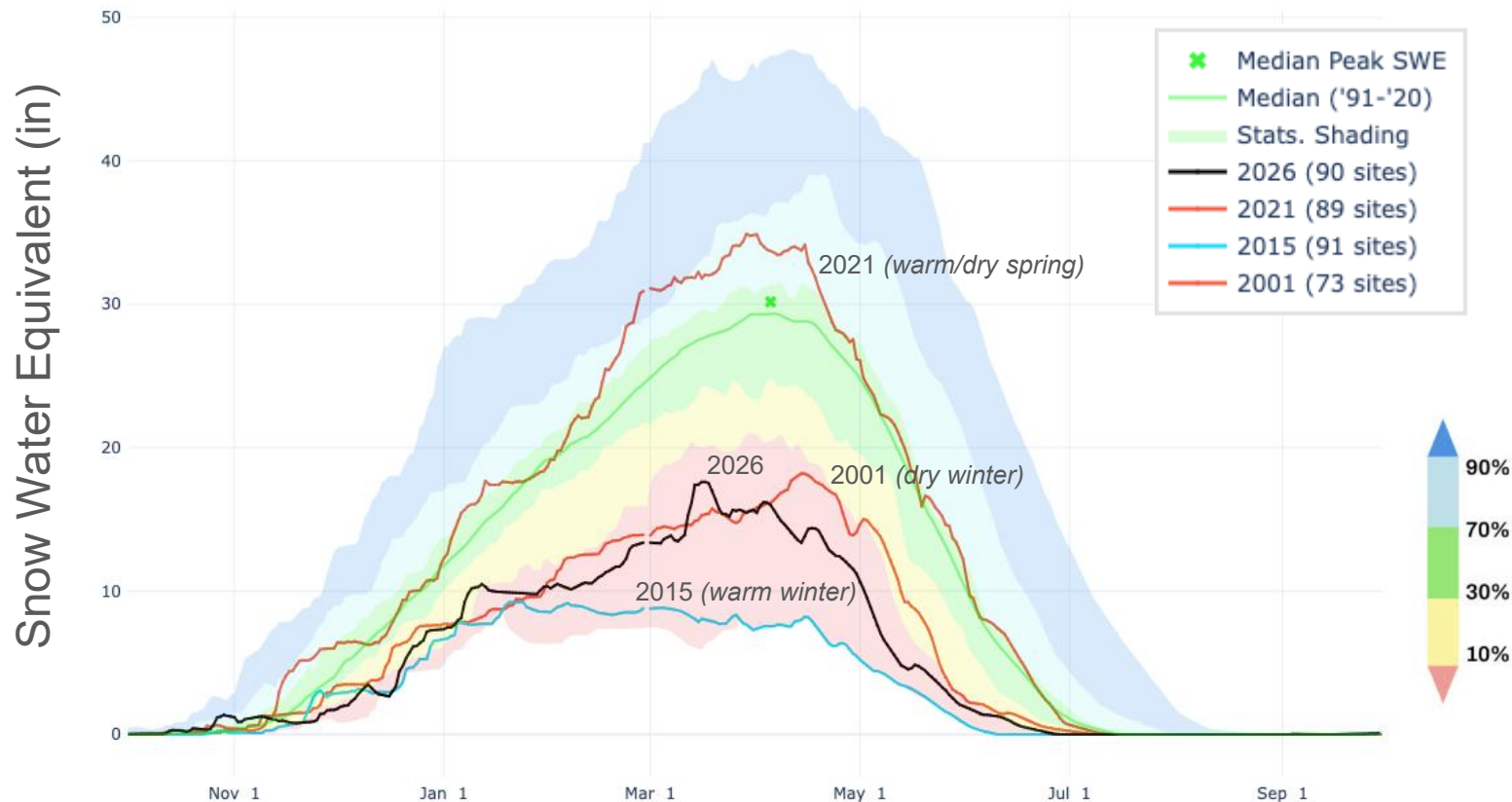
— State Boundaries

 **NRCS** Natural Resources
Conservation Service

Created 4-10-2026, 02:42 PM PDT

Source: <https://nwcc-apps.sc.egov.usda.gov/imap/>

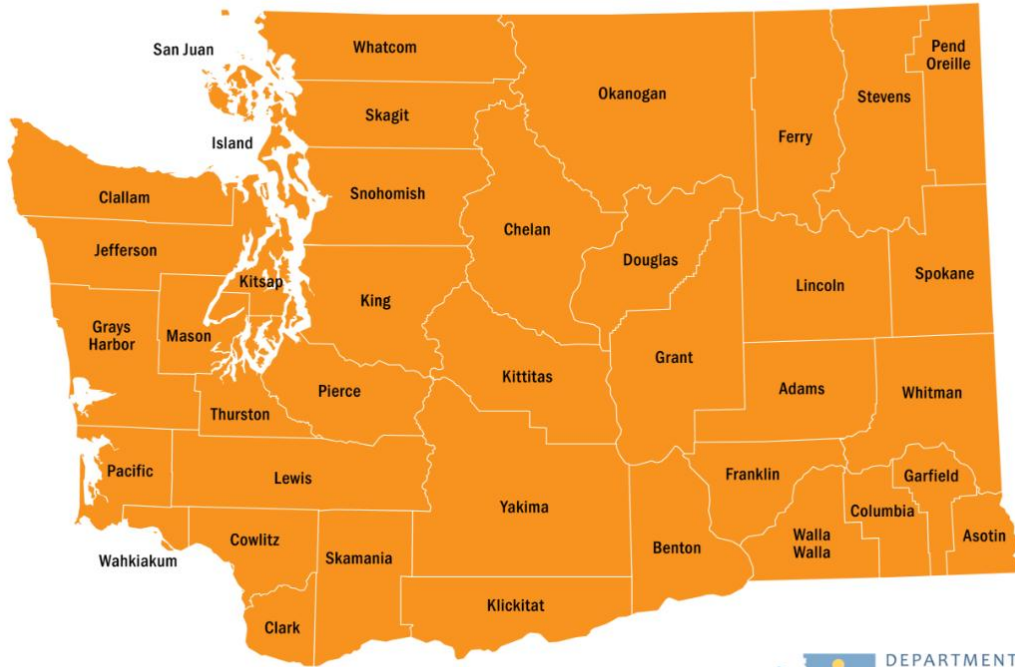
Washington Average Snowpack



Washington State Declared Drought April 8



Washington Drought Declaration 2026



 Drought Declaration

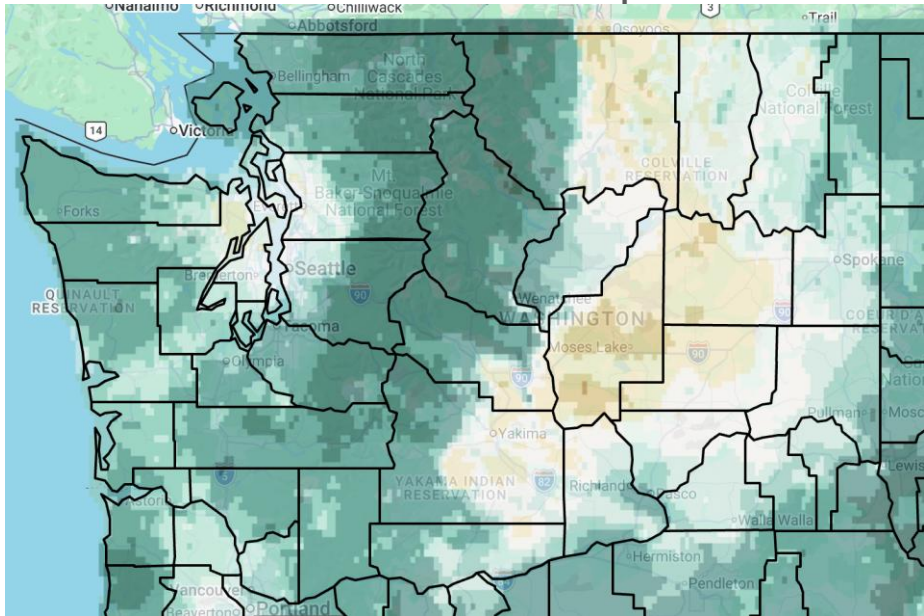


- Water supply less than 75% of normal
- Undue hardship expected for people, farms, and fish

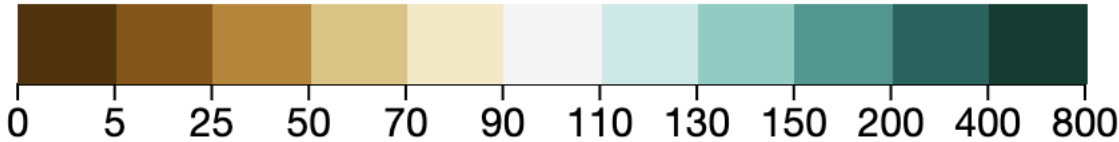
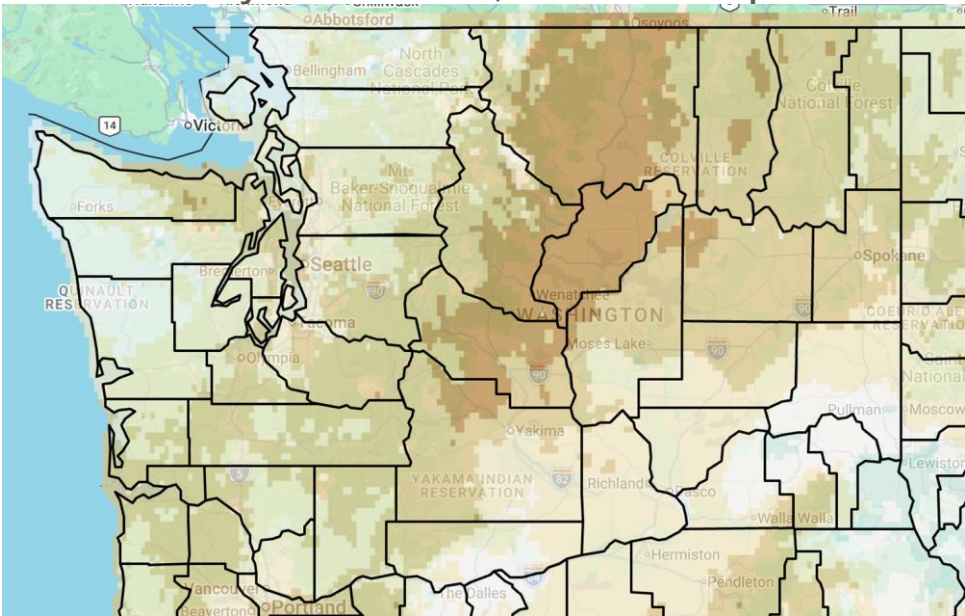
Wetter conditions shifted to drier conditions



December 2025 Precipitation



January 1-March 8, 2026 Precipitation



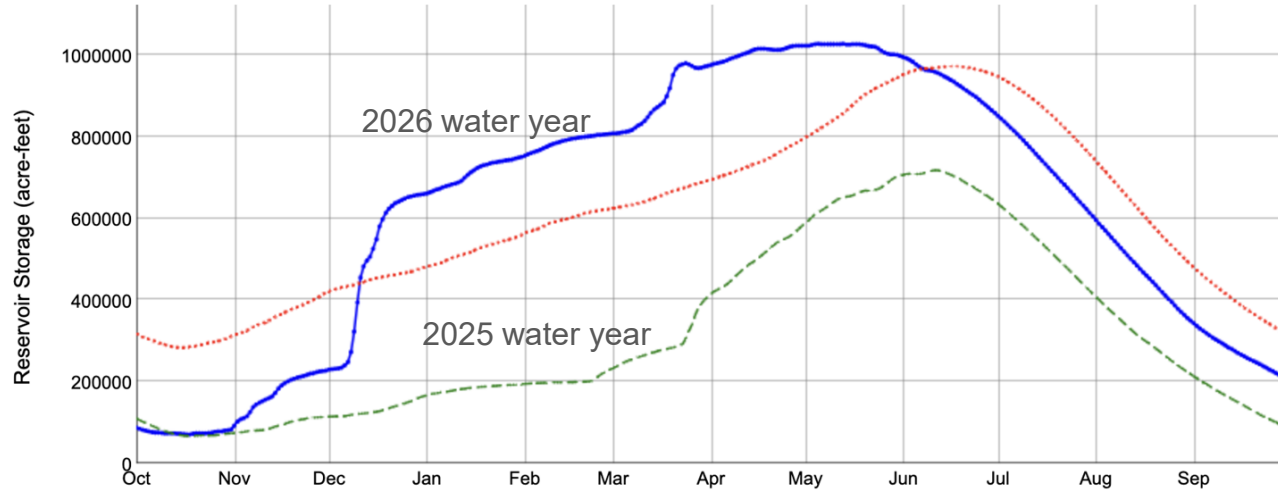
Precipitation Percent of Average (%)

Yakima Basin Reservoirs



Water Year Graph

— Current Year
-- Previous Year
... Average



PROVISIONAL DATA - Subject to change

USBR April-Sept water supply forecasts for prorable water users:

Apr: 52%

May: 52%

Jun: 52%

Jul: 56%

Aug: 58%

Sep: 60%

Multiple Years of Drought Declarations

Washington Drought Declaration Areas



2023



Washington Drought Declaration and Advisory

2025



Washington Drought Declaration

2024



Washington Drought Declaration 2026

2026

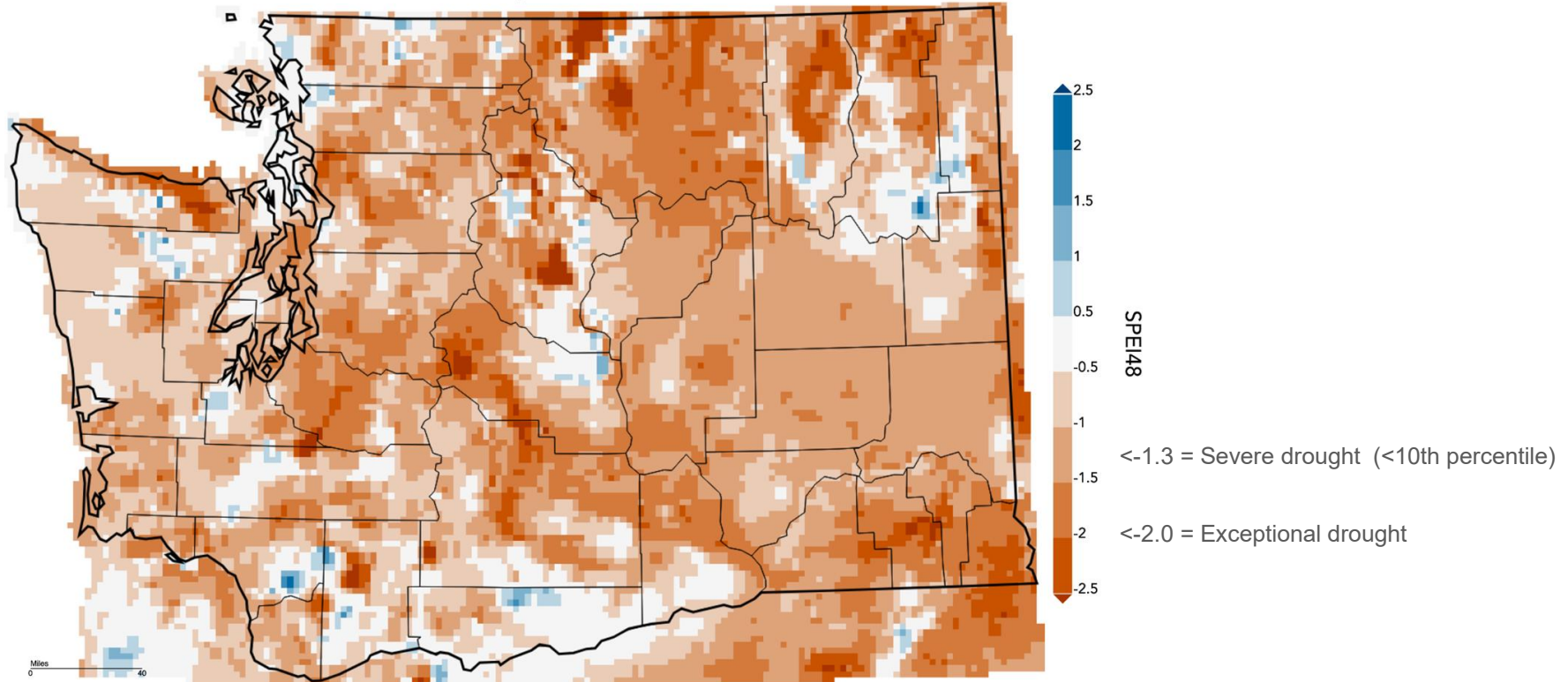


Multiple Years of Drought



Standardized Precipitation and Evapotranspiration Index

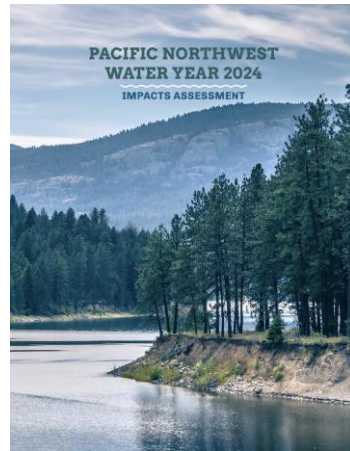
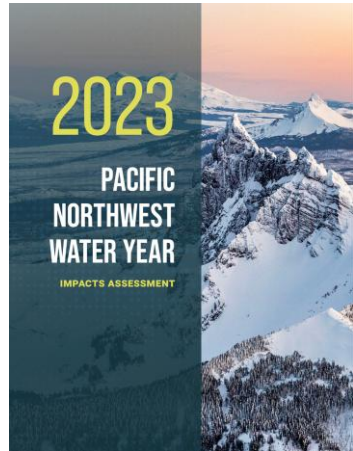
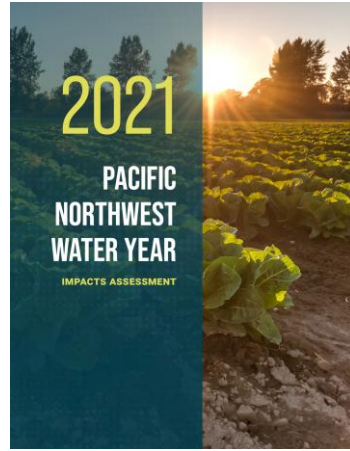
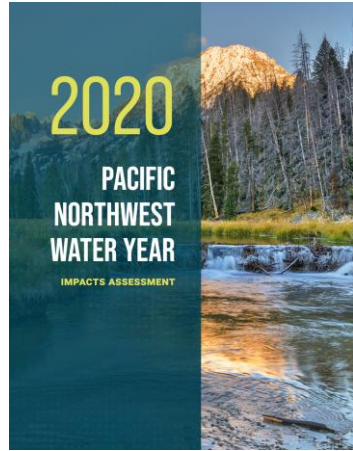
Washington - 48 Month SPEI
September 2026



**How can you help
us understand
drought?**

PNW Water Year Meetings, Impacts Survey, and Assessments

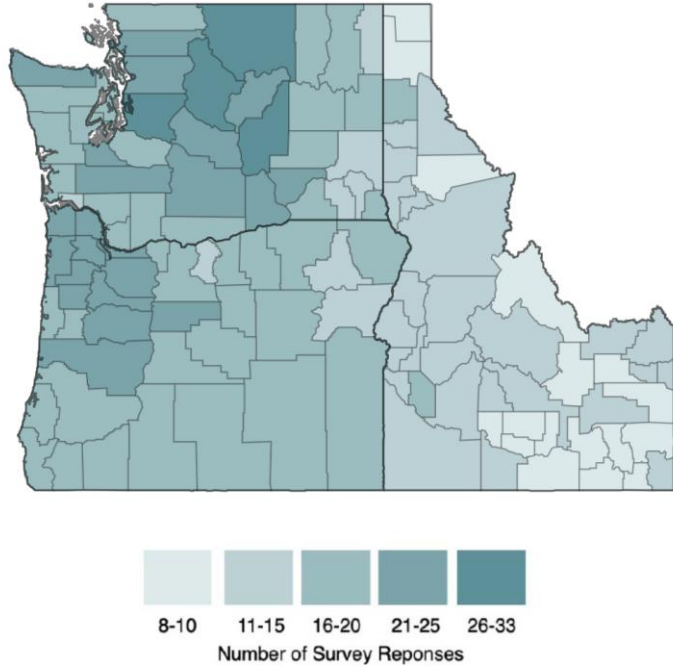
PNW Water Year Impacts Assessment Since 2020



Purpose: To document water year conditions, sector-specific impacts, and responses so that we can be better prepared for future change.

Source: <https://ciq.uw.edu/projects/annual-assessment-of-water-year-impacts-in-the-pacific-northwest/>

Response by County

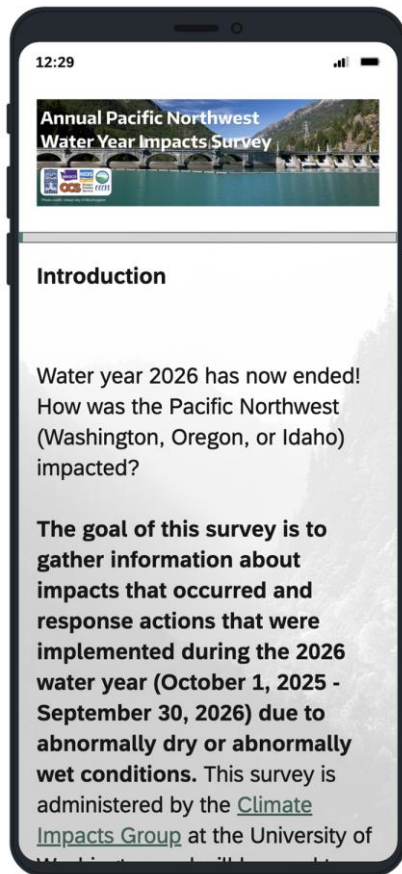


- 291 reports of “dry” and 33 reports of “wet”
- Yakima Basin proratables: 40% of water allotment Apr-Sept
- Senior water right curtailment in Yakima Basin Oct 6-31, 2025
- Reduced hydropower production (86% of normal) for utility in eastern WA, northern ID, and western MT

Figure 18: The number of survey respondents working within each county of the PNW. Those who indicated that their work is statewide were included in each county in that state.

(Water Year 2025: October 2024-September 2025)

PNW Water Year Impacts Survey 2026



Impacts from abnormally dry or abnormally wet conditions to:

- Agriculture
- Drinking water
- Forestry
- Fish and Wildlife
- Hydropower
- Recreation
- Stormwater
- Public Health - *new this year*

**Take the PNW Water Year
2026 Impacts Survey**



(Water Year 2026: October 2025-

Oregon-Washington Water Year 2026 Recap and 2027 Outlook Meeting

November 2-3, 2026

**Register for the OR-WA Water
Year 2026 Meeting**

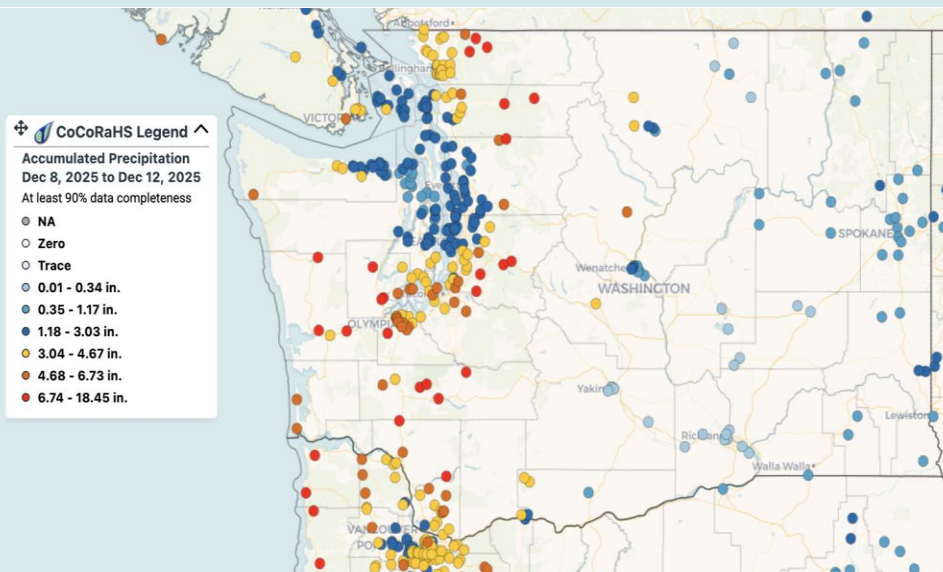


Photo credit: University of Washington

**Join
CoCoRaHS!**

- Observers measure daily precipitation in their very own backyard using a simple gauge
- Become part of the largest neighborhood-scale rain observation network in Washington
- Some observers have been observing long enough to make it into longer-term climate records!

CoCoRaHS Observations: Dec 2025 Floods

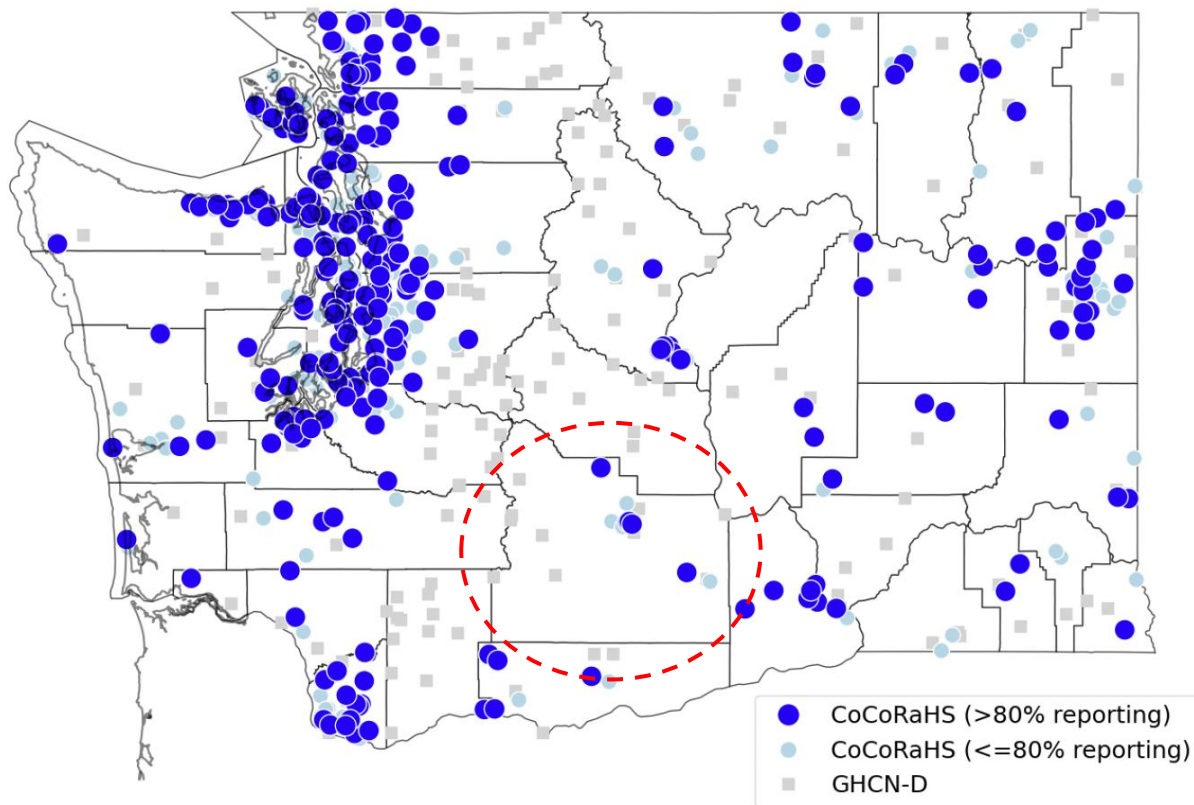


Become a CoCoRaHS Observer!



<https://www.cocorahs.org/>

Join over 650 observers statewide!



Invite a friend or relative
in a data-sparse region to
join!

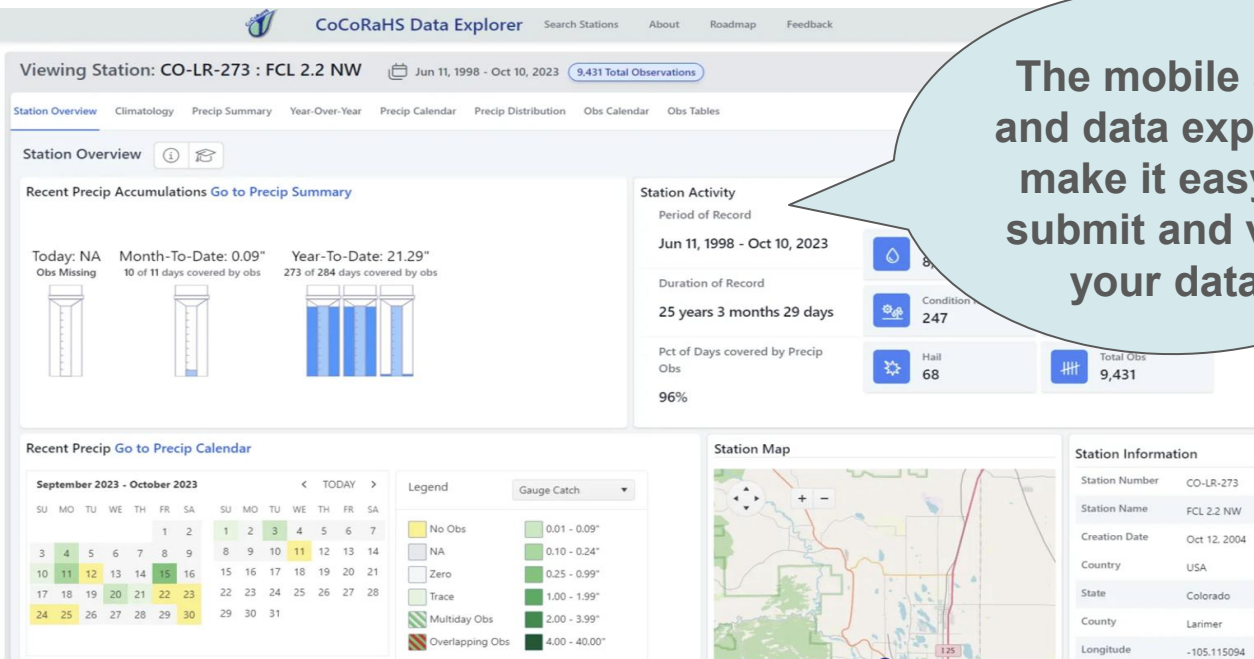
Become a CoCoRaHS Observer!



<https://www.cocorahs.org/>

“I think of CoCoRaHS like the nerves under a person’s skin. Dozens of nerves are useful, but THOUSANDS of nerves give you so much better feedback.”

- Laurie Pitman, Kitsap County [Learn more about Laurie’s story](#)



Become a CoCoRaHS Observer!



<https://www.cocorahs.org/>

The Future of Drought in Washington

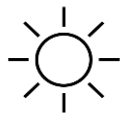
Projected Changes

Statewide Average Temperature Trends (1895-2023)

Annual Trend: **+2.0°F**



Winter: ↑ +2.9°F



Summer: ↑ +2.4°F



Fall: ↑ +1.6°F



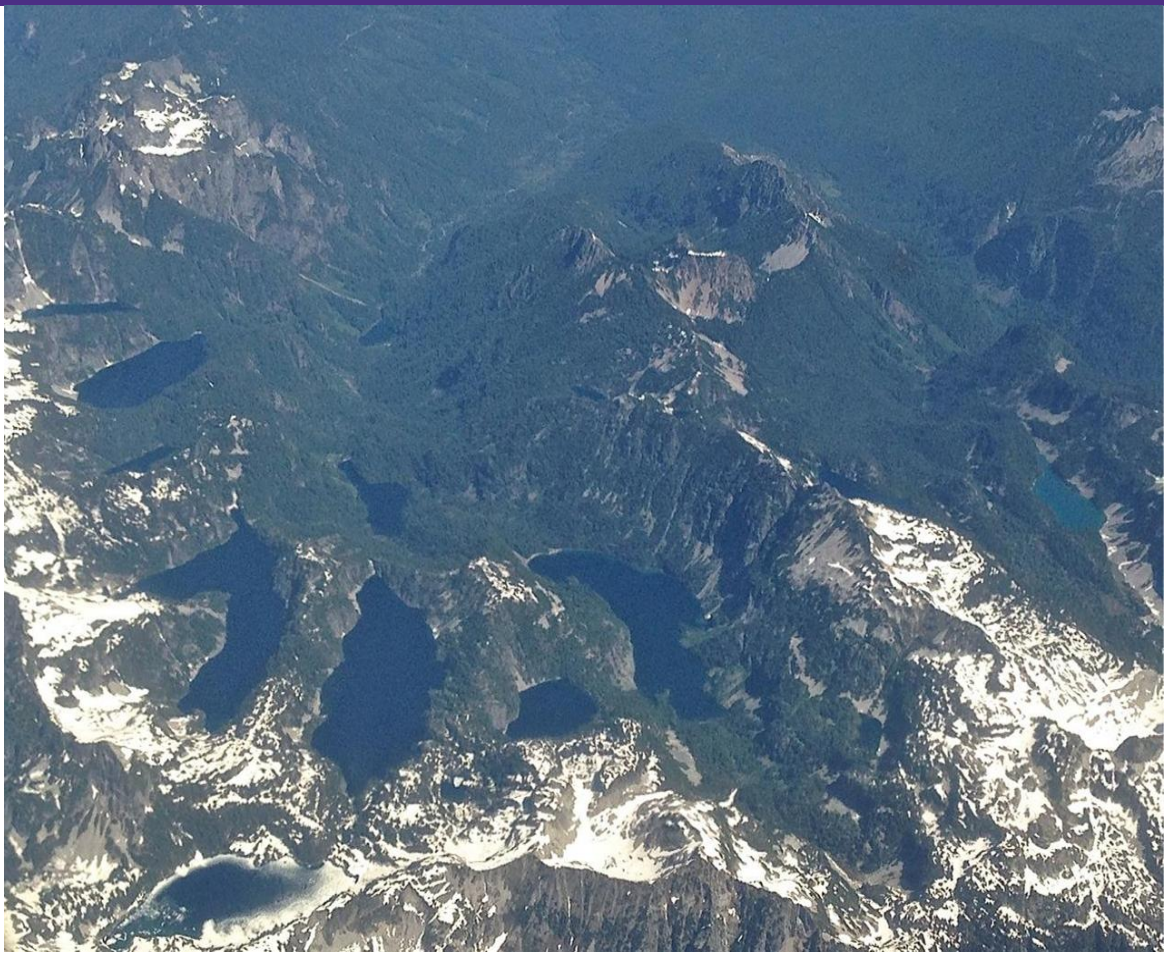
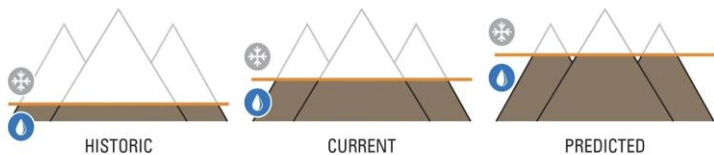
Spring: ↑ +1.2°F

Declining Snowpack

Our primary mechanism for storing water – snow – is sensitive to warming.

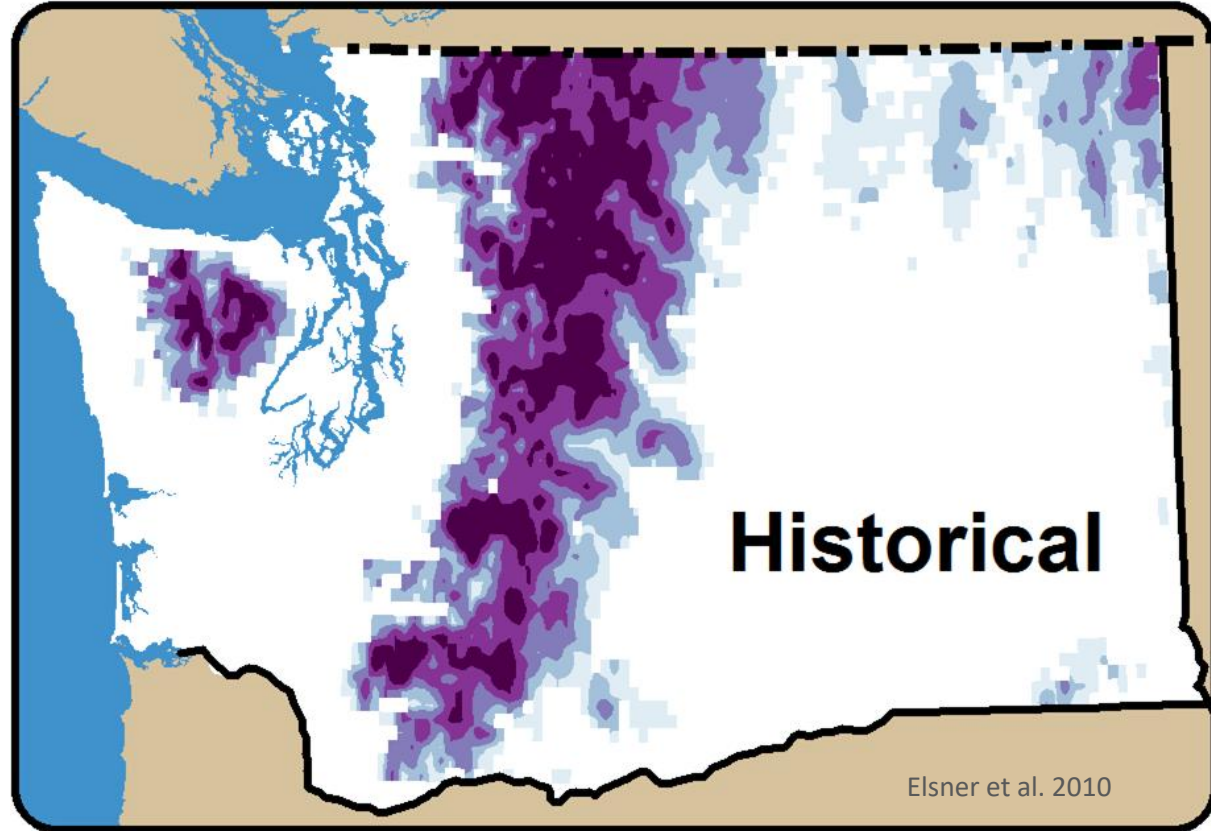
Projected change for 2080s:
-55% (range: -83 to -17%)

*(Hamlet et al. 2013:
moderate A1B scenario,
rel. to 1980s)*



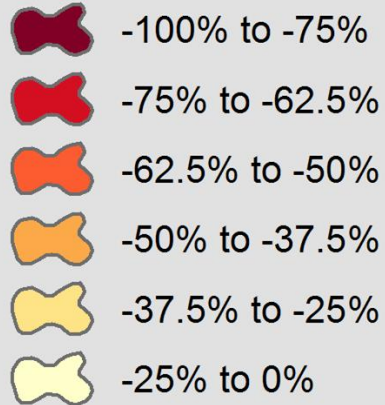
April 1 Snow Water Equivalent Historical

Historical

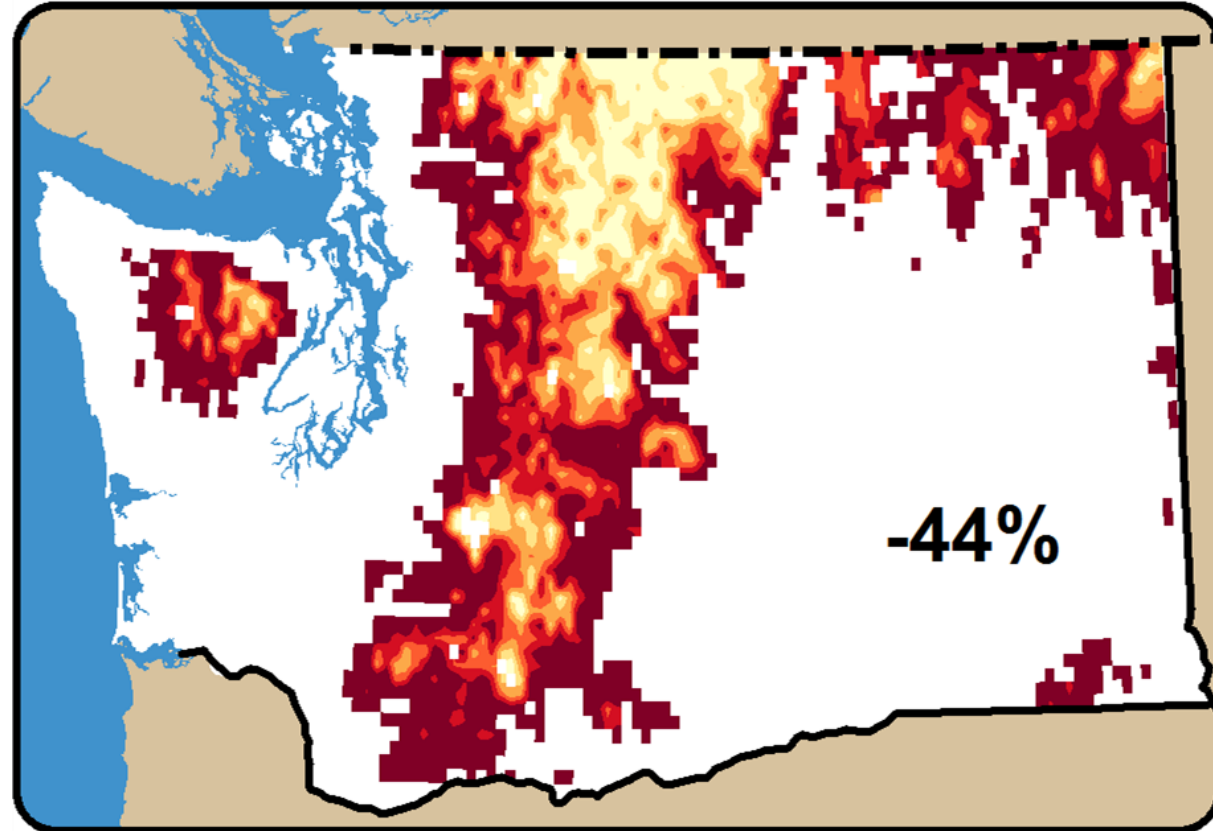


April 1 Snow Water Equivalent 2040s

Change



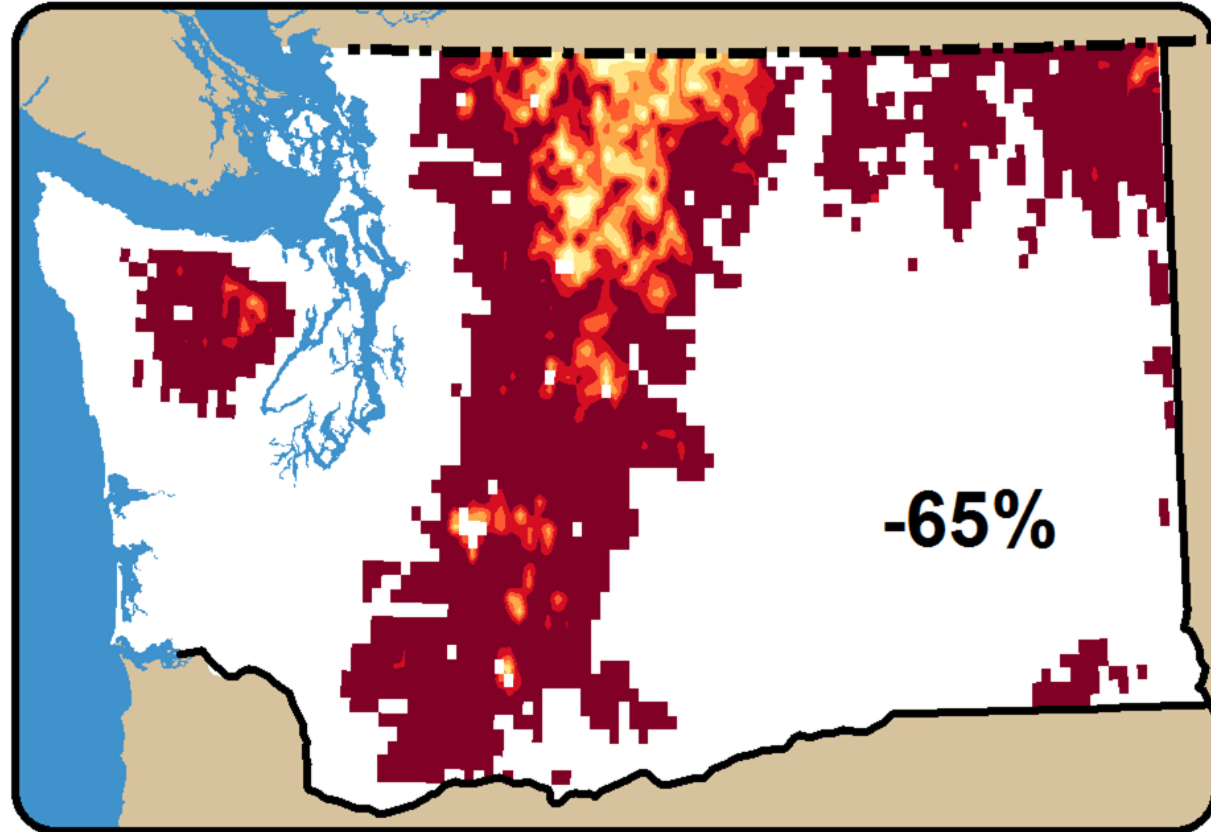
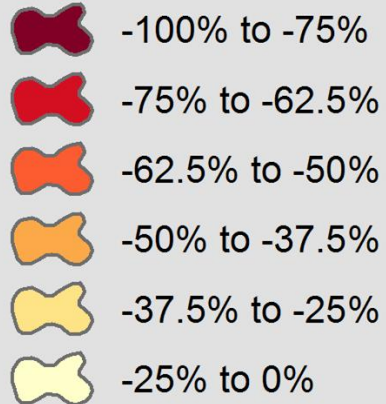
2040s



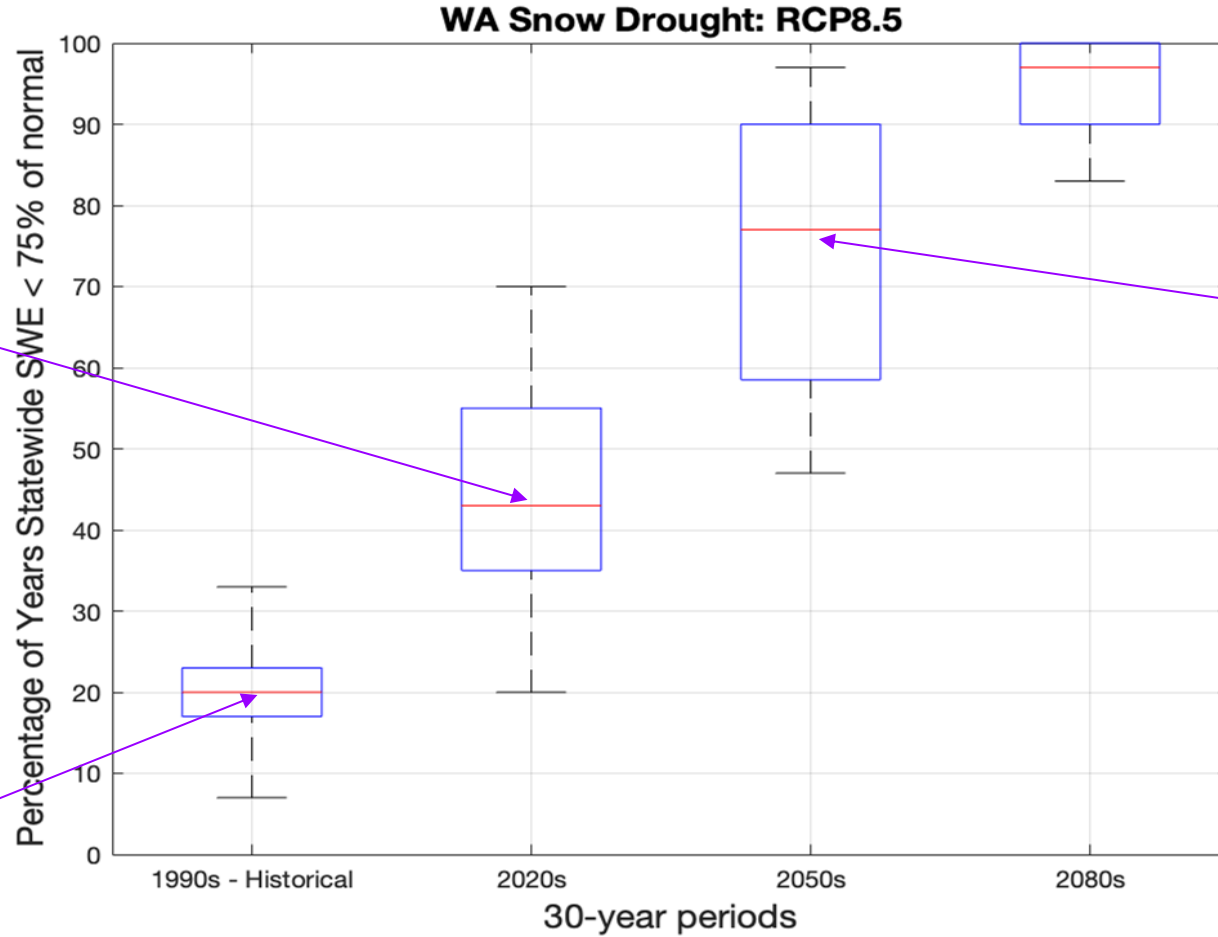
April 1 Snow Water Equivalent 2080s

2080s

Change



Increased Likelihood of “snow drought”

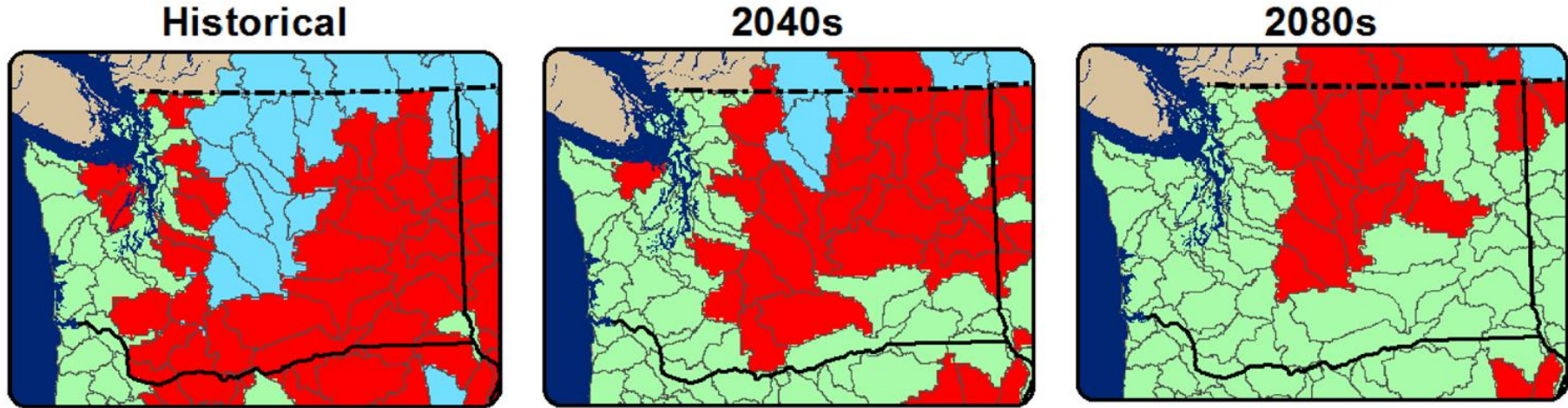


2020s:
40% frequency
4 yrs/decade

Historical:
20% frequency
2 yrs/decade

2050s:
75% frequency
7+ yrs/decade

Rain dominant areas will increase, snow dominant areas will decrease

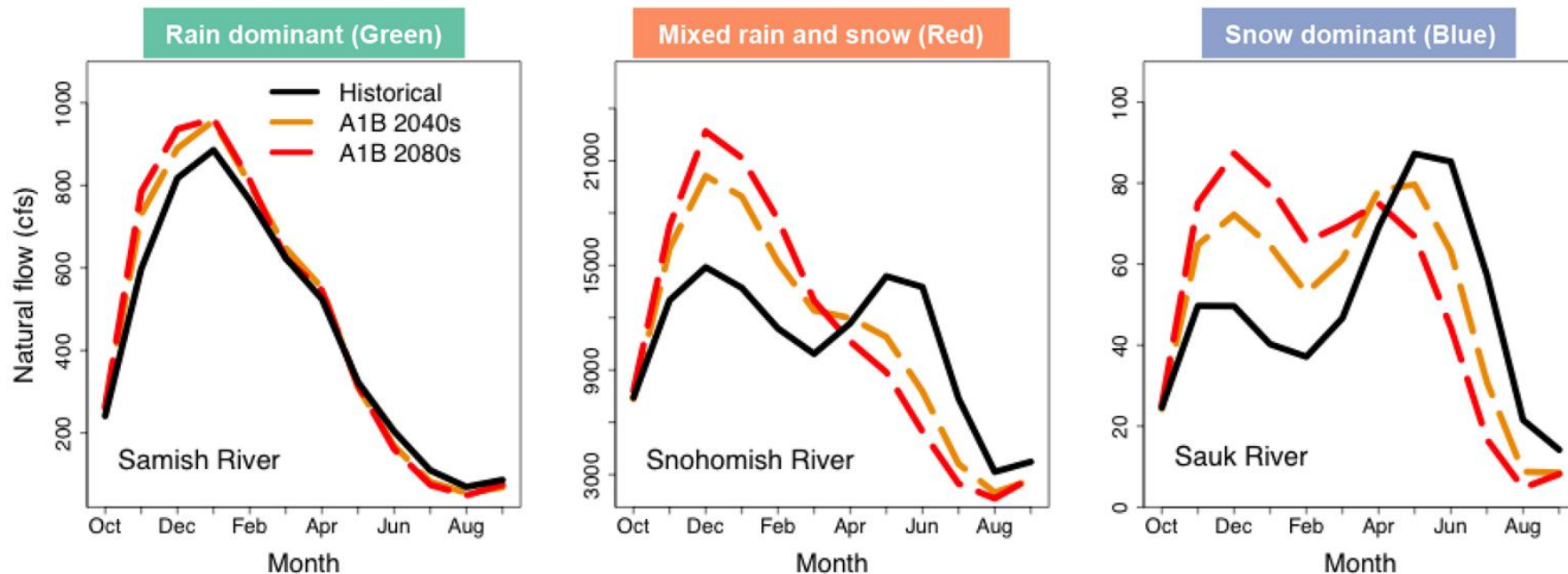


Percentage of Winter Precipitation Captured in Peak Snowpack

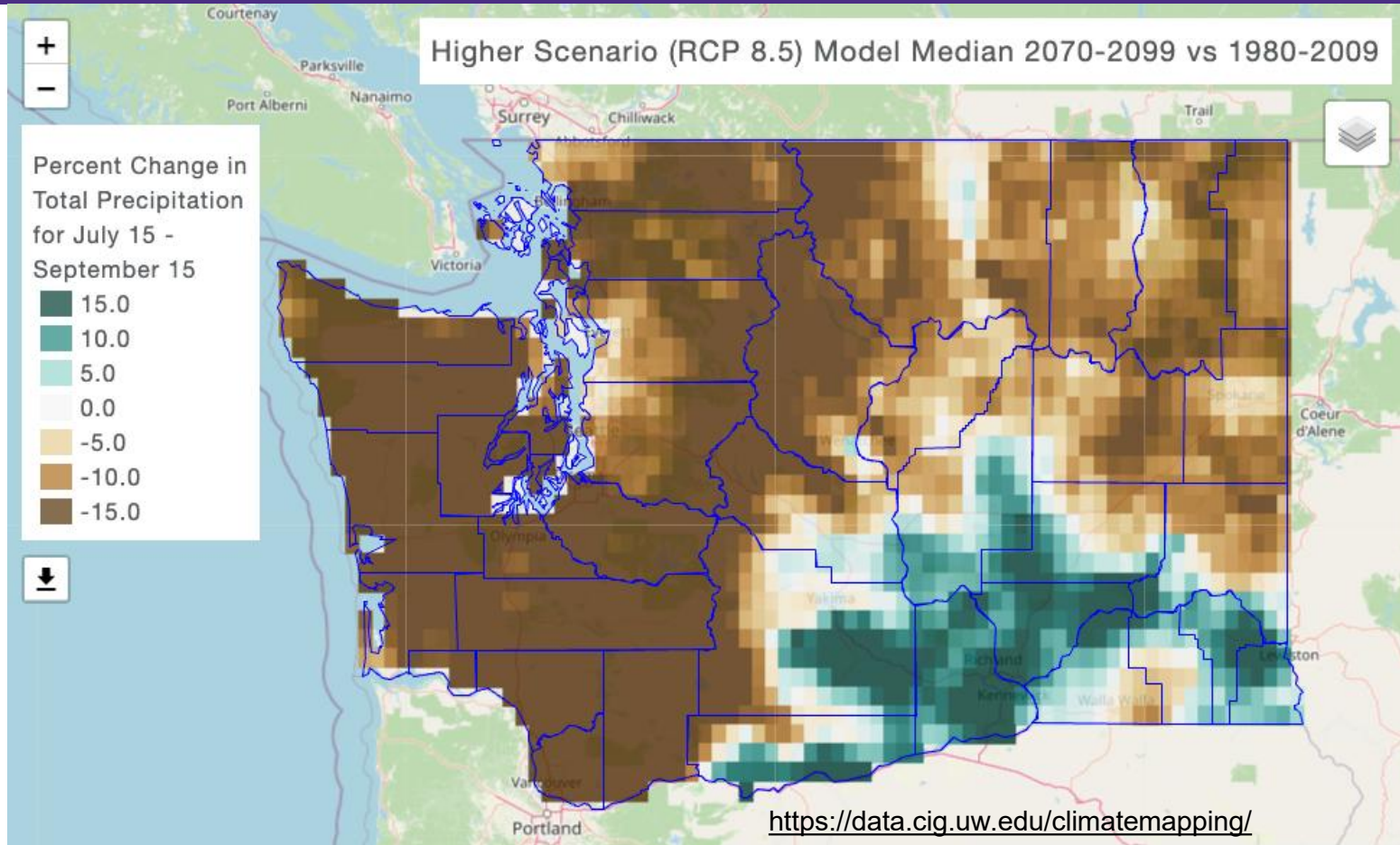
< 10%  Rain dominant 10% - 40%  Mixed rain and snow > 40%  Snow dominant

Middle GHG scenario (A1B, similar to SSP2-4.5)

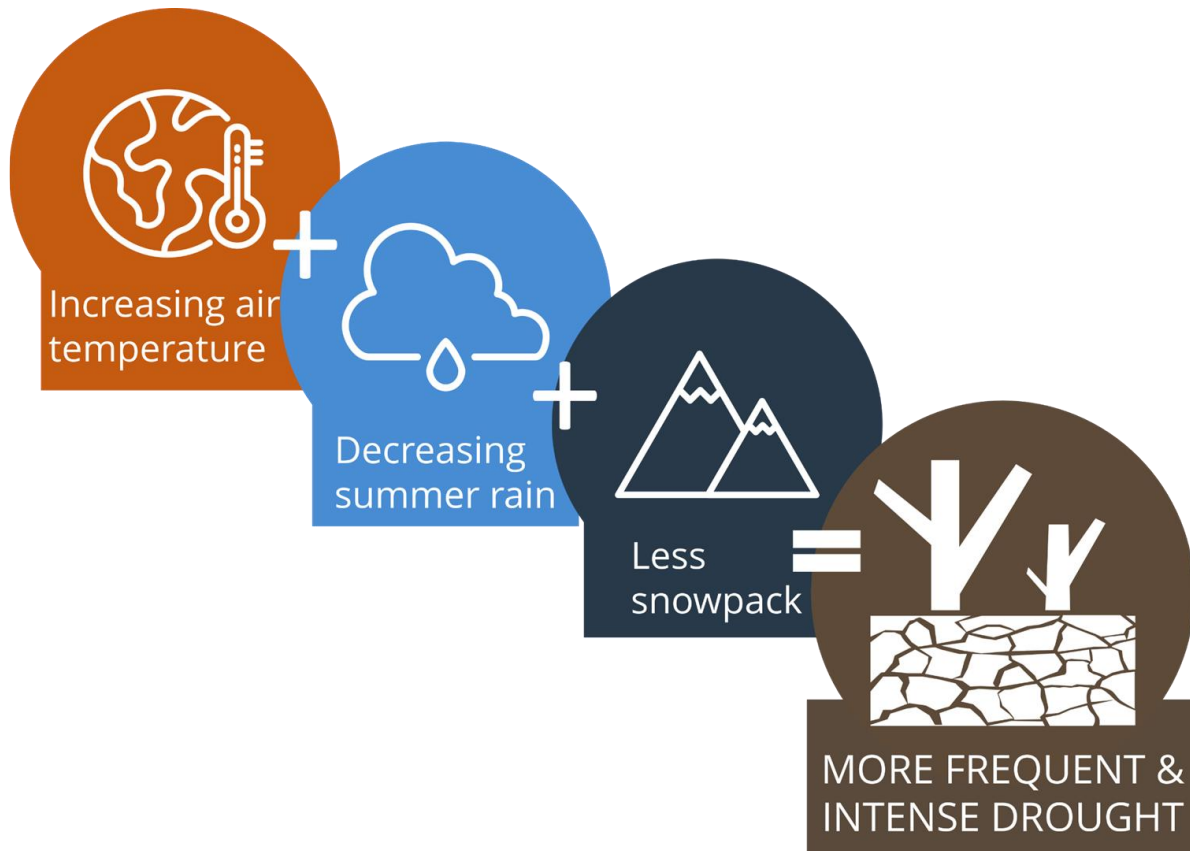
Hydrology is most affected in basins that historically accumulated snow



Declines in summer precipitation



Combining Forces: Climate Drivers of Drought





2nd warmest September-August on record for WA
~4°F warmer than the 20th century average



14th driest April to August in WA

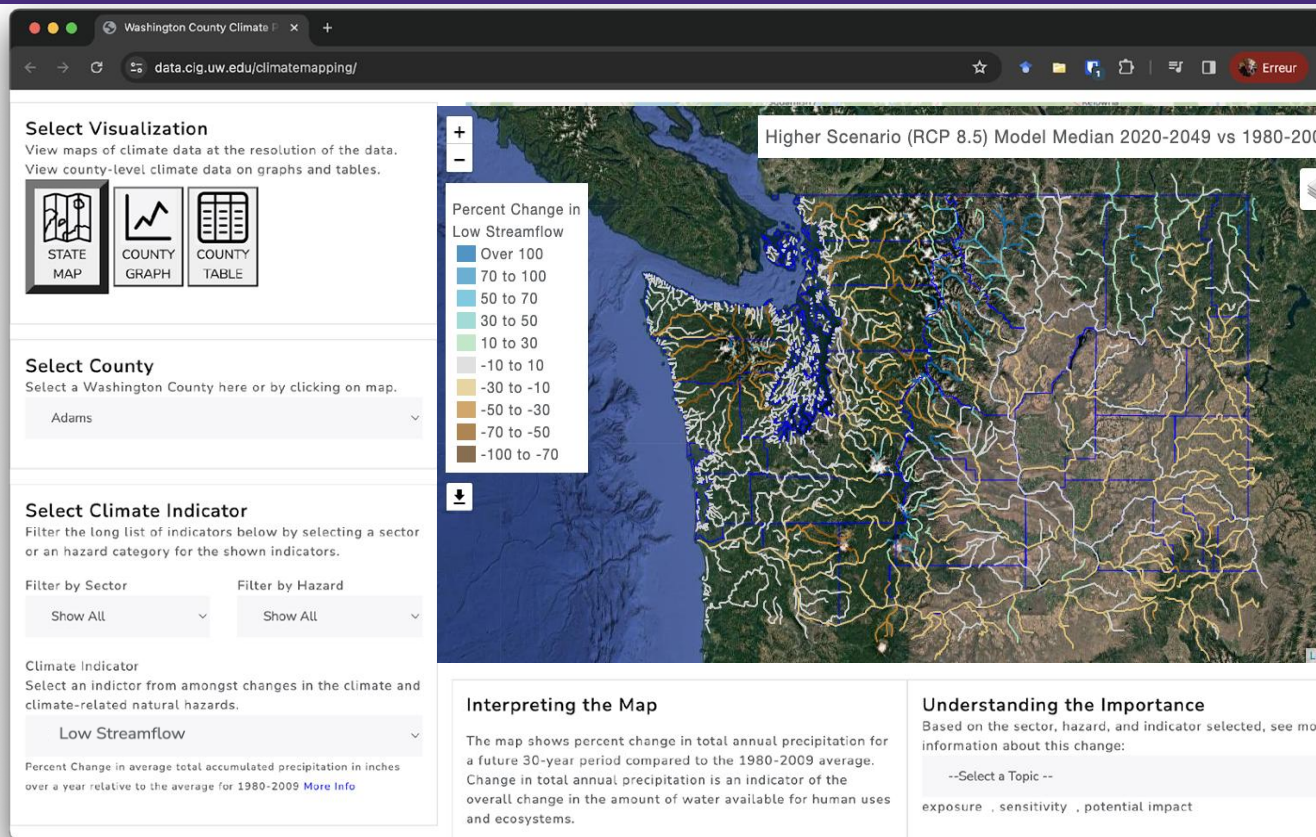


3rd lowest snowpack on record for WA
53% of normal (1991-2020 average)

Climate Mapping for a Resilient Washington Tool



<https://data.cig.uw.edu/climatemapping/>



Climate Mapping for a Resilient Washington Tool Continued

Select Visualization

View maps of climate data at the resolution of the data. View county-level climate data on graphs and tables.



Select whether you want to view a graph, map, or table

Select County

Select a Washington County here or by clicking on map.

King

Select your county of interest

Select Climate Indicator

Filter the long list of indicators below by selecting a sector or an hazard category for the shown indicators.

Filter by Sector ①

Filter by Hazard

Show All

Extreme Heat

Climate Indicator

Select an indicator from amongst changes in the climate and climate-related natural hazards.

Summer Maximum Temperature

Change in the average daily summer (June-August) maximum temperature relative to 1980-2009. [More Info](#)

Select Future Projections

Select greenhouse gas scenarios and future time periods. Note that some scenarios are not available for all variables. [More Info](#)

Select a Future Greenhouse Gas Scenario. ①

Higher Scenario (RCP 8.5)

Select a Future Time Period ①

2020-2049

Filter by Hazard and toggle between the Climate Indicators for each hazard.

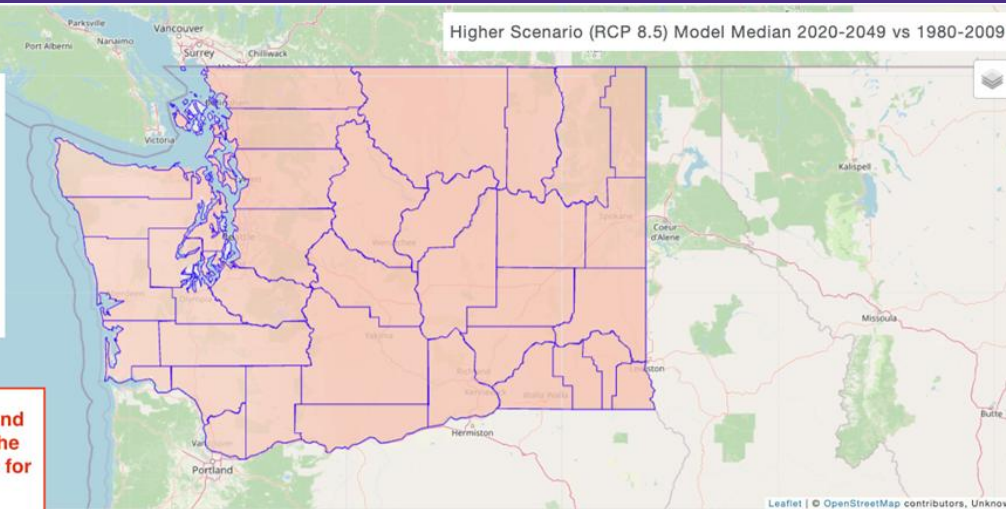
Interpreting the Map

The map shows the change in average summer (June - August) maximum temperature for a future 30-year period compared to 1980-2009. For example, a location with a value of 4.0 means that the average summer maximum temperature is expected to increase by 4.0 degrees Fahrenheit. The change in average summer maximum temperature is an indicator of heat stress for people, ecosystems and infrastructure.

+ MORE INFO

Select between different Greenhouse Gas Scenarios and select different Time Periods

Higher Scenario (RCP 8.5) Model Median 2020-2049 vs 1980-2009



Understanding the Importance

Based on the sector, hazard, and indicator selected, see more information about this change:

--Select a Topic--

exposure ①, sensitivity ①, potential impact ①

Learn about how to interpret your chosen climate indicator and learn more about why each indicator is important.



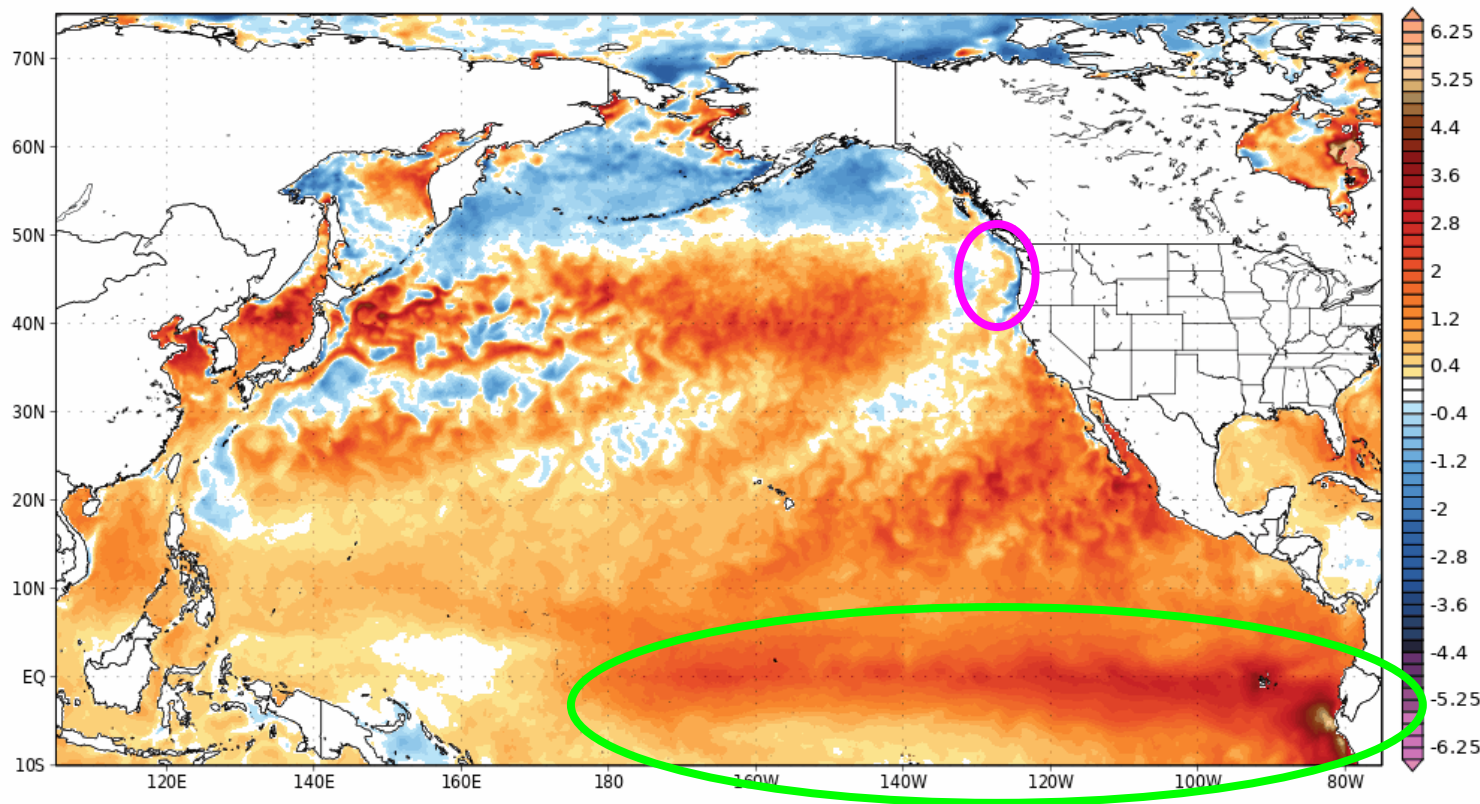
El Niño

Sea-Surface Temperature Anomalies July 2-Sept 29



NOAA Coral Reef Watch Sea Surface Temperature Anomaly [°C]
15 Day Running Mean Ending Jul 02, 2026

1991-2020 Climatology
Alex Boreham | cyclonicwx.com



“Loads the dice” for
warmer and
possibly drier winter
conditions

Source: <https://cyclonicwx.com/sst/>

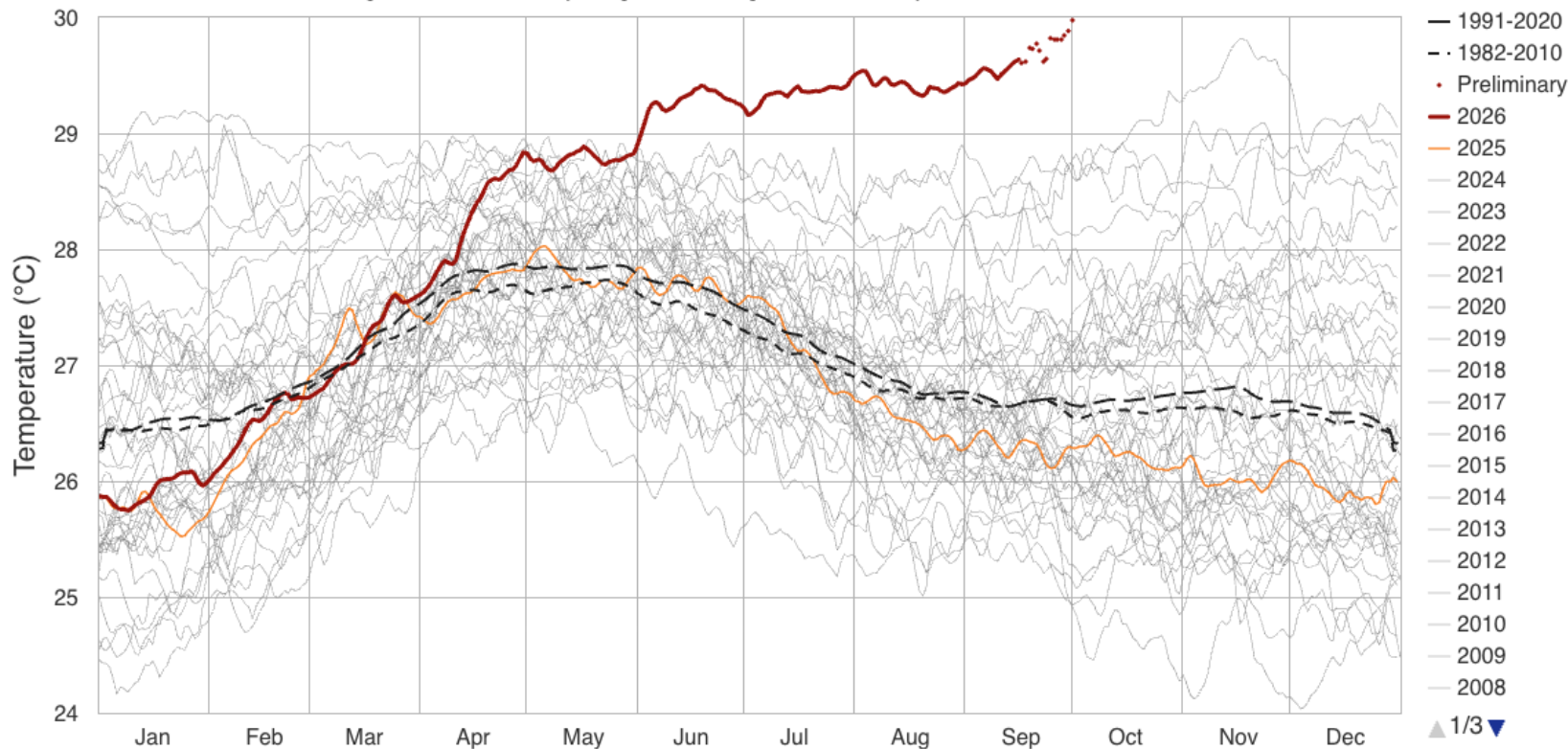
Highly likely to persist as a very strong El Niño



Daily Sea Surface Temperature, Niño 3.4 (5°S–5°N, 120–170°W)

Dataset: NOAA OISST V2.1 | Image Credit: ClimateReanalyzer.org, Climate Change Institute, University of Maine

≡ [Export Chart](#)



Source: [View on Climate Reanalyzer](#)

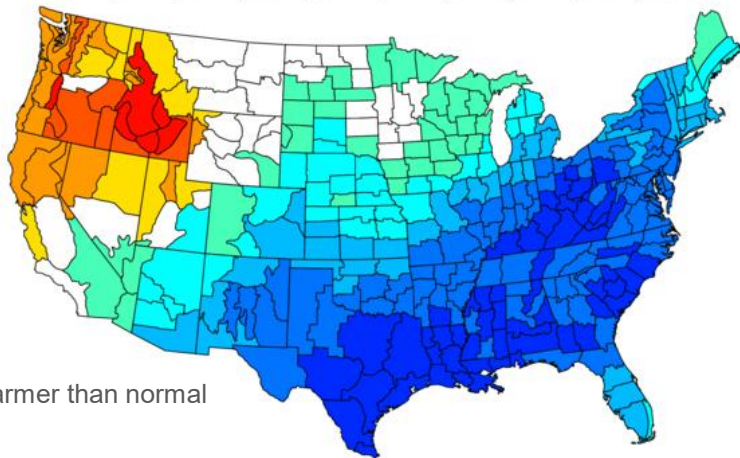
Average El Niño Winter (Nov-Mar) conditions



Temperature

NOAA/NCEI Climate Division Composite Standardized Temperature Anomalies
Versus 1981–2010 Longterm Average

Nov to Mar 1965–66, 1968–69, 1969–70, 1972–73, 1976–77, 1977–78, 1979–80, 1986–87,
1987–88, 1991–92, 1994–95, 2002–03, 2004–05, 2006–07, 2009–10, 2014–15, 2018–19, 2023–24,



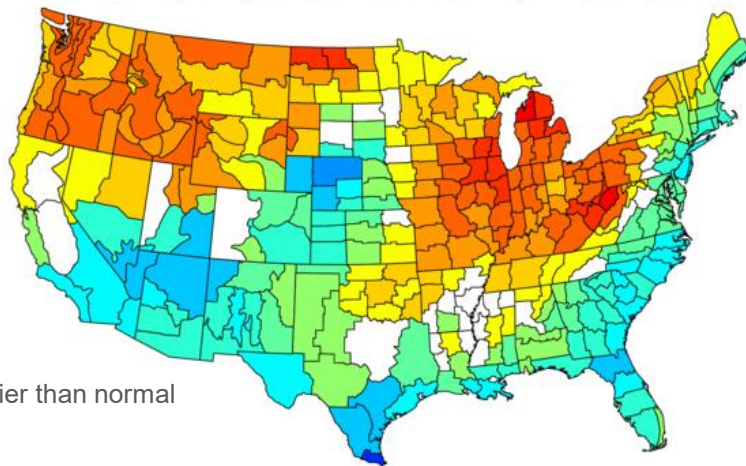
Red = warmer than normal



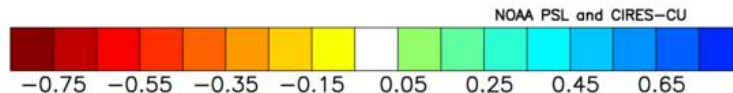
Precipitation

NOAA/NCEI Climate Division Composite Standardized Precipitation Anomalies
Versus 1981–2010 Longterm Average

Nov to Mar 1965–66, 1968–69, 1969–70, 1972–73, 1976–77, 1977–78, 1979–80, 1986–87,
1987–88, 1991–92, 1994–95, 2002–03, 2004–05, 2006–07, 2009–10, 2014–15, 2018–19, 2023–24,



Red = drier than normal



Recent El Niño events (minus three strongest events):

1965/66, 1968/69, 1969/70, 1972/73, 1976/77, 1977/78, 1979/80, 1986/87, 1987/88,
1991/92, 1994/95, 2002/03, 2004/05, 2006/07, 2009/10, 2014/15, 2018/19, 2023/24

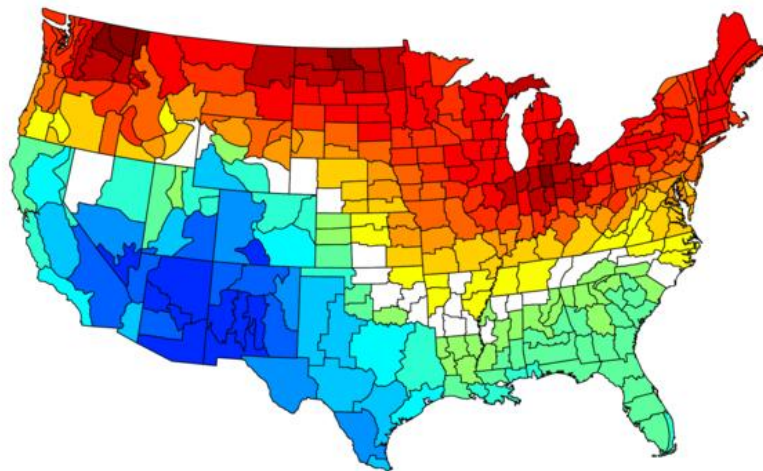
Source: <https://psl.noaa.gov/data/usclimdivs/>

Average El Niño Winter (Nov-Mar) conditions cont.



Temperature

NOAA/NCEI Climate Division Composite Standardized Temperature Anomalies
Nov to Mar 1965–66, 1972–73, 1982–83, 1991–92, 1997–98, 2015–16, 1957–58
Versus 1981–2010 Longterm Average

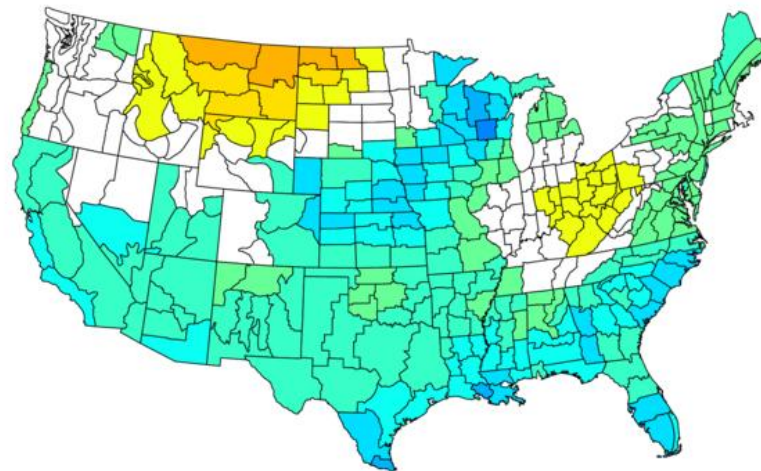


NOAA PSL and CIRES-CU

-0.75 -0.55 -0.35 -0.15 0.05 0.25 0.45 0.65

Precipitation

NOAA/NCEI Climate Division Composite Standardized Precipitation Anomalies
Nov to Mar 1965–66, 1972–73, 1982–83, 1991–92, 1997–98, 2015–16, 1957–58
Versus 1981–2010 Longterm Average



NOAA PSL and CIRES-CU

-2.00 -1.50 -1.00 -0.50 0.00 0.50 1.00 1.50 2.00

Seven “very strong” El Niño events:
1957/58, 1965/66, 1972/73, 1982/83, 1991/92, 1997/98, 2015/16

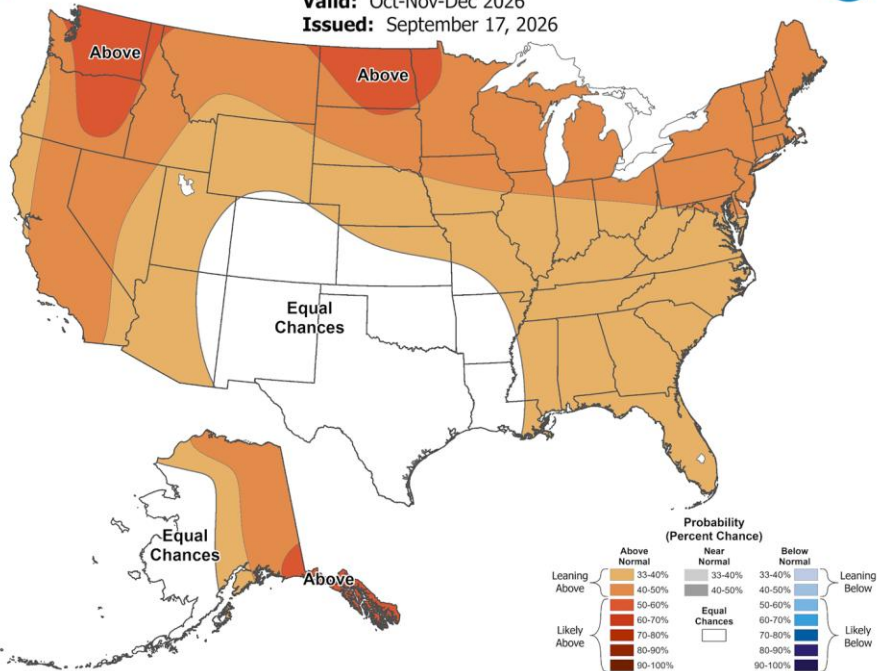
Source: <https://psl.noaa.gov/data/usclimdivs/>

National Multi-Model Ensemble: Oct-Dec



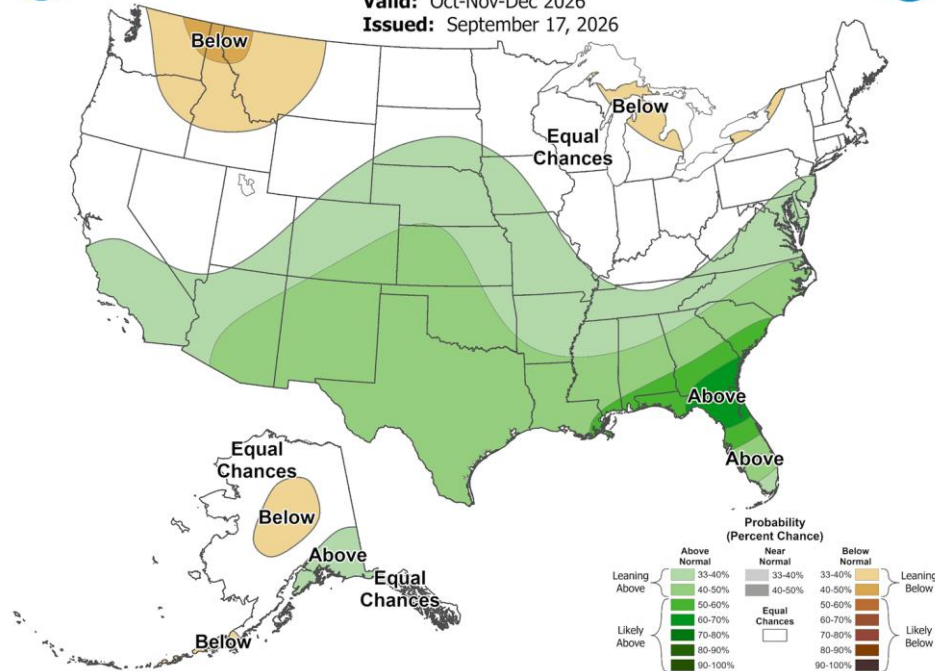
Seasonal Temperature Outlook

Valid: Oct-Nov-Dec 2026
Issued: September 17, 2026



Seasonal Precipitation Outlook

Valid: Oct-Nov-Dec 2026
Issued: September 17, 2026

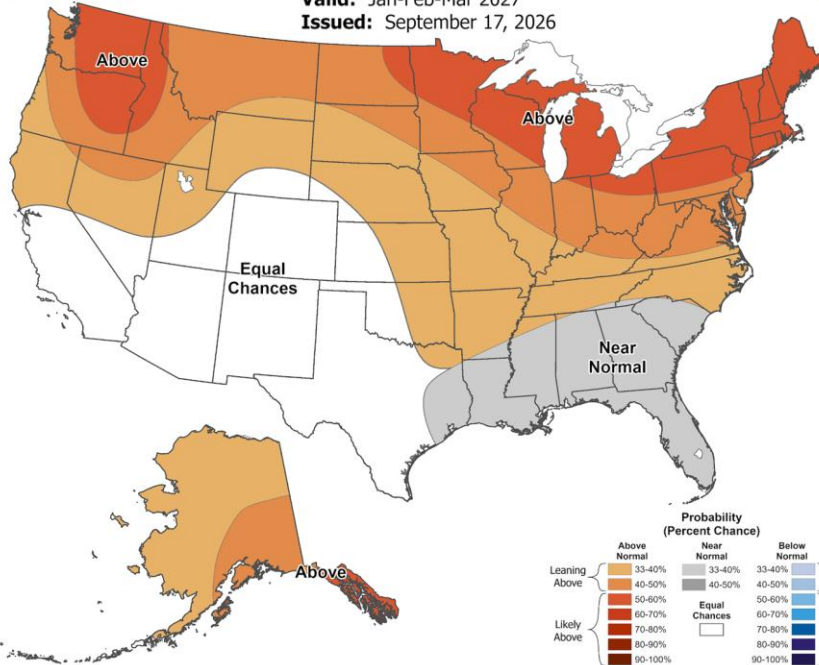


National Multi-Model Ensemble: Jan-Mar



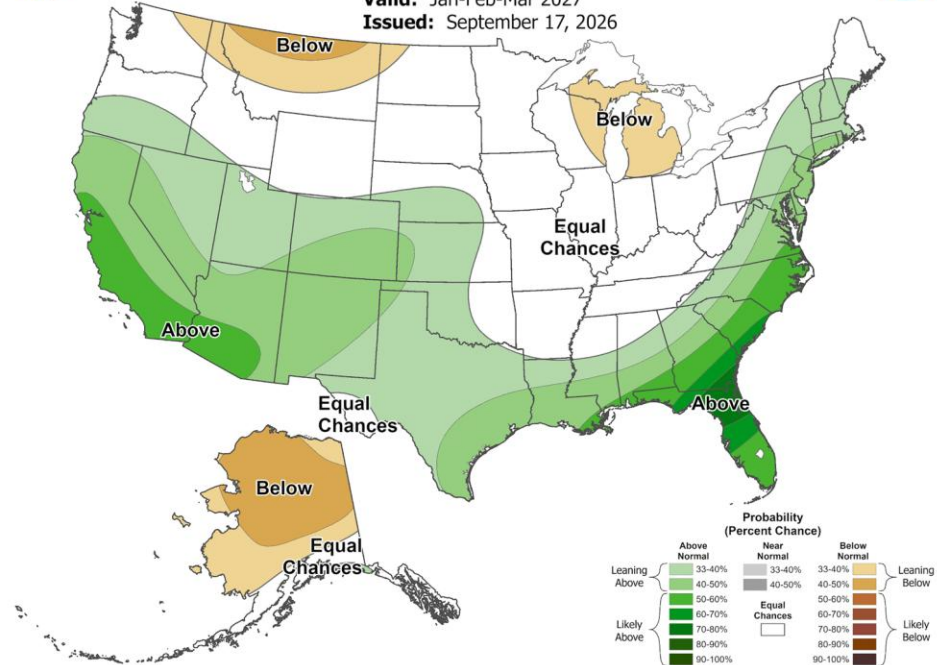
Seasonal Temperature Outlook

Valid: Jan-Feb-Mar 2027
Issued: September 17, 2026



Seasonal Precipitation Outlook

Valid: Jan-Feb-Mar 2027
Issued: September 17, 2026



Key Takeaways



- **There are several ways to make a drought:** dry winter, warm winter, dry/warm spring and summer
- **Warming temperatures are driving snowpack loss** and making droughts worse
- 2026 was a “**warm winter**” **type**, which are the type that **we expect to see more of in the future**
- **El Niño** will stick around this winter, increasing the odds of **warmer than normal temperatures**
 - Late winter precipitation is more uncertain

**Take the PNW Water Year
2026 Impacts Survey**



Become a CoCoRaHS Observer!



Thank you!



Questions?