

Water Supply Availability Committee

| Friday, August 18th, 2023 | | | | |
|---------------------------|----------|---------------|--|------------------------------------|
| Start Time | End Time | Duration, min | Description | |
| 9:00 | 9:15 | 15 | Welcome & Introductions | Jeff Marti, Ecology |
| 9:15 | 9:30 | 15 | Mountain Conditions | Scott Pattee, NRCS |
| 9:30 | 9:45 | 15 | Regional Climate Setting/ ENSO | Karin Bumbaco & Nick Bond, OWSC |
| 9:45 | 9:55 | 10 | Streamflow and Groundwater | Jeff Marti, Ecology |
| 9:55 | 10:10 | 15 | Water Supply Forecasts | Amy Burke, NWRFC |
| 10:10 | 10:25 | 15 | Yakima Project | Chris Lynch, BOR |
| 10:25 | 11:00 | 35 | Open Discussion: What impacts are people hearing about in the declaration areas and elsewhere? | All |

Drought Declaration



Drought declared on July 24, 2023

Watersheds

Impacts/Hardship Summary

Nooksack

- At least three public water systems' wells are not functioning.
- Irrigators with water rights junior to instream flow rule are curtailed.

Upper Skagit Lower Skagit

- Irrigators with water rights junior to instream flow rule are curtailed.
- Skagit Drainage and Irrigation District Consortium petitioned for a drought declaration (representing 12,800 acres of farmland).
- Loss of high value crops without emergency transfer from Skagit PUD.

Dungeness

- Jamestown S'Klallam Tribe notified Ecology about likely fish passage barriers on the Dungeness River if flow drops below 140 cubic feet per second, predicted to occur in mid August.

Lyre-Hoko Sol Duc-Hoh

- Clallam County PUD's Island View Water System is trucking water to all 34 customers.
- The Makah Tribe moved fish from their hatchery to a Quilcene hatchery. The Tribe is using part of their freshwater supply fighting brushfires.

| Watersheds | Impacts/Hardship Summary |
|--|---|
| Methow | <ul style="list-style-type: none"> Irrigators with water rights junior to instream flow rule are curtailed. |
| Okanogan | <ul style="list-style-type: none"> Irrigators with water rights junior to instream flow rule are curtailed. |
| Upper Yakima Naches Lower Yakima | <ul style="list-style-type: none"> Bureau of Reclamation has pro-rated junior districts (e.g., Roza, Kittitas Reclamation District, Wapato Irrigation Project) to 72 percent of normal. Some mid-season fallowing has already occurred. Some cherry trees are not being watered post-harvest. Concerns about crop stress and reduced crop yields. Significant concern for late-season water availability. 157 rights held by junior districts are currently under curtailment. |
| Walla Walla | <ul style="list-style-type: none"> The Walla Walla River is completely dry in some places. Irrigators were curtailed beginning June 7. Watermaster reported there is “no water left to transfer.” Focusing on junior right holders to get <u>some</u> water when senior right holders stop taking water. Crop loss has been reported by the State Conservation Commission. |

Statewide Temperature May – July Top Ten Warmest 1895-2023

| Washington May-July Average Temperature | | |
|---|-------|---------|
| Units: Degrees Fahrenheit | | |
| Base Period: 1901-2000 | | |
| Date | Value | Anomaly |
| 201507 | 63.4 | 5.5 |
| 195807 | 63.1 | 5.2 |
| 202107 | 62.3 | 4.4 |
| 202307 | 62.2 | 4.3 |
| 199207 | 61.2 | 3.3 |
| 201807 | 61.1 | 3.2 |
| 201407 | 60.4 | 2.5 |
| 194007 | 60.3 | 2.4 |
| 199807 | 60.2 | 2.3 |
| 198507 | 60.1 | 2.2 |

Statewide Precipitation May - July Top Ten Driest 1895-2023

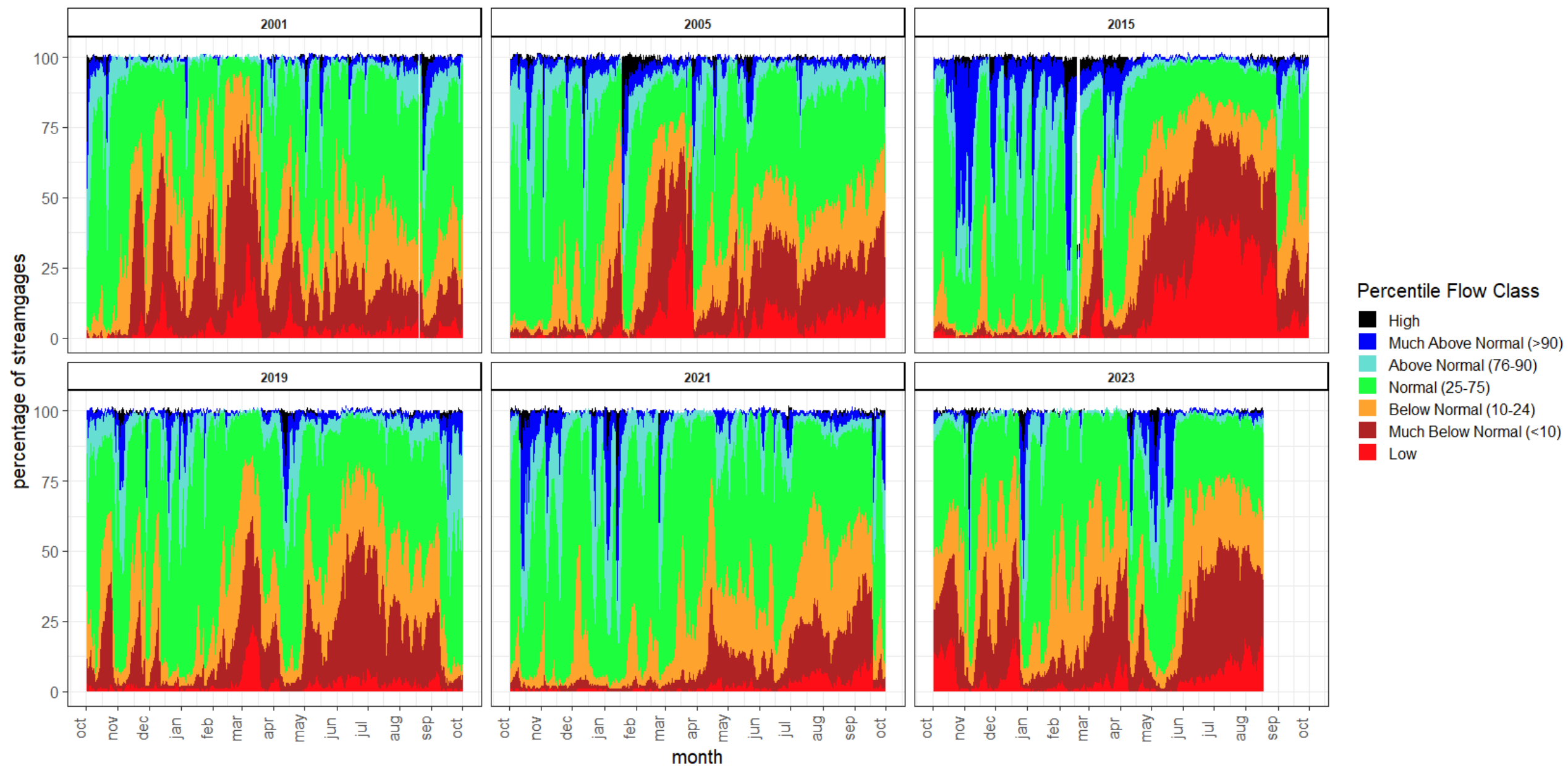
| Washington May-July Precipitation | | |
|-----------------------------------|-------|---------|
| Units: Inches | | |
| Base Period: 1901-2000 | | |
| Date | Value | Anomaly |
| 192207 | 1.81 | -3.22 |
| 192407 | 2.05 | -2.98 |
| 200307 | 2.14 | -2.89 |
| 201507 | 2.4 | -2.63 |
| 193807 | 2.44 | -2.59 |
| 202307 | 2.56 | -2.47 |
| 201807 | 2.61 | -2.42 |
| 202107 | 2.7 | -2.33 |
| 197007 | 2.84 | -2.19 |
| 192807 | 3.03 | -2 |

Consecutive Weeks in “Severe Drought” status (US Drought Monitor)

| FIPS | StartDate | EndDate | ConsecutiveWeeks | State | County | |
|-------|-----------|-----------|------------------|-------|---------------------|--|
| 53003 | 7/27/2023 | 8/17/2023 | 4 | WA | Asotin County | |
| 53005 | 8/3/2023 | 8/17/2023 | 3 | WA | Benton County | |
| 53007 | 7/13/2023 | 8/17/2023 | 6 | WA | Chelan County | |
| 53013 | 7/27/2023 | 8/17/2023 | 4 | WA | Columbia County | |
| 53021 | 8/3/2023 | 8/17/2023 | 3 | WA | Franklin County | |
| 53023 | 7/27/2023 | 8/17/2023 | 4 | WA | Garfield County | |
| 53033 | 7/13/2023 | 8/17/2023 | 6 | WA | King County | |
| 53037 | 7/13/2023 | 8/17/2023 | 6 | WA | Kittitas County | |
| 53051 | 7/13/2023 | 8/17/2023 | 6 | WA | Pend Oreille County | |
| 53055 | 7/13/2023 | 8/17/2023 | 6 | WA | San Juan County | |
| 53057 | 7/13/2023 | 8/17/2023 | 6 | WA | Skagit County | |
| 53059 | 7/6/2023 | 8/17/2023 | 7 | WA | Skamania County | |
| 53061 | 7/13/2023 | 8/17/2023 | 6 | WA | Snohomish County | |
| 53065 | 7/13/2023 | 8/17/2023 | 6 | WA | Stevens County | |
| 53071 | 7/27/2023 | 8/17/2023 | 4 | WA | Walla Walla County | |
| 53073 | 7/13/2023 | 8/17/2023 | 6 | WA | Whatcom County | |
| 53075 | 7/27/2023 | 8/17/2023 | 4 | WA | Whitman County | |

8 consecutive weeks at D2, or 1 week at D3 or worse will trigger USDA disaster declaration

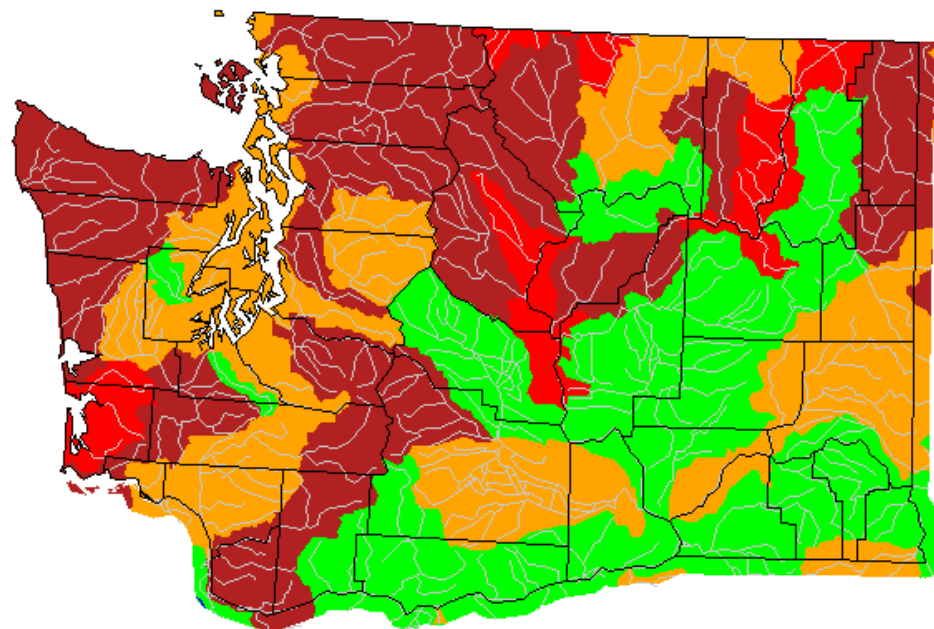
Time series plot of daily streamflow compared to historical streamflow for the day of the water year (Washington)



data: USGS WaterWatch

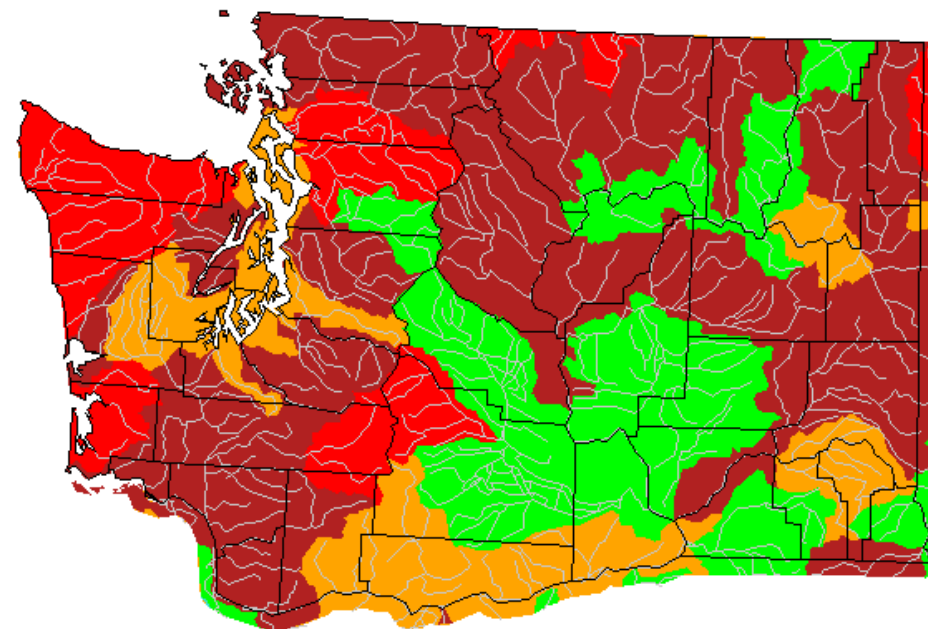
28 Day Average Streamflow This year vs 2015

Tuesday, August 15, 2023



USGS

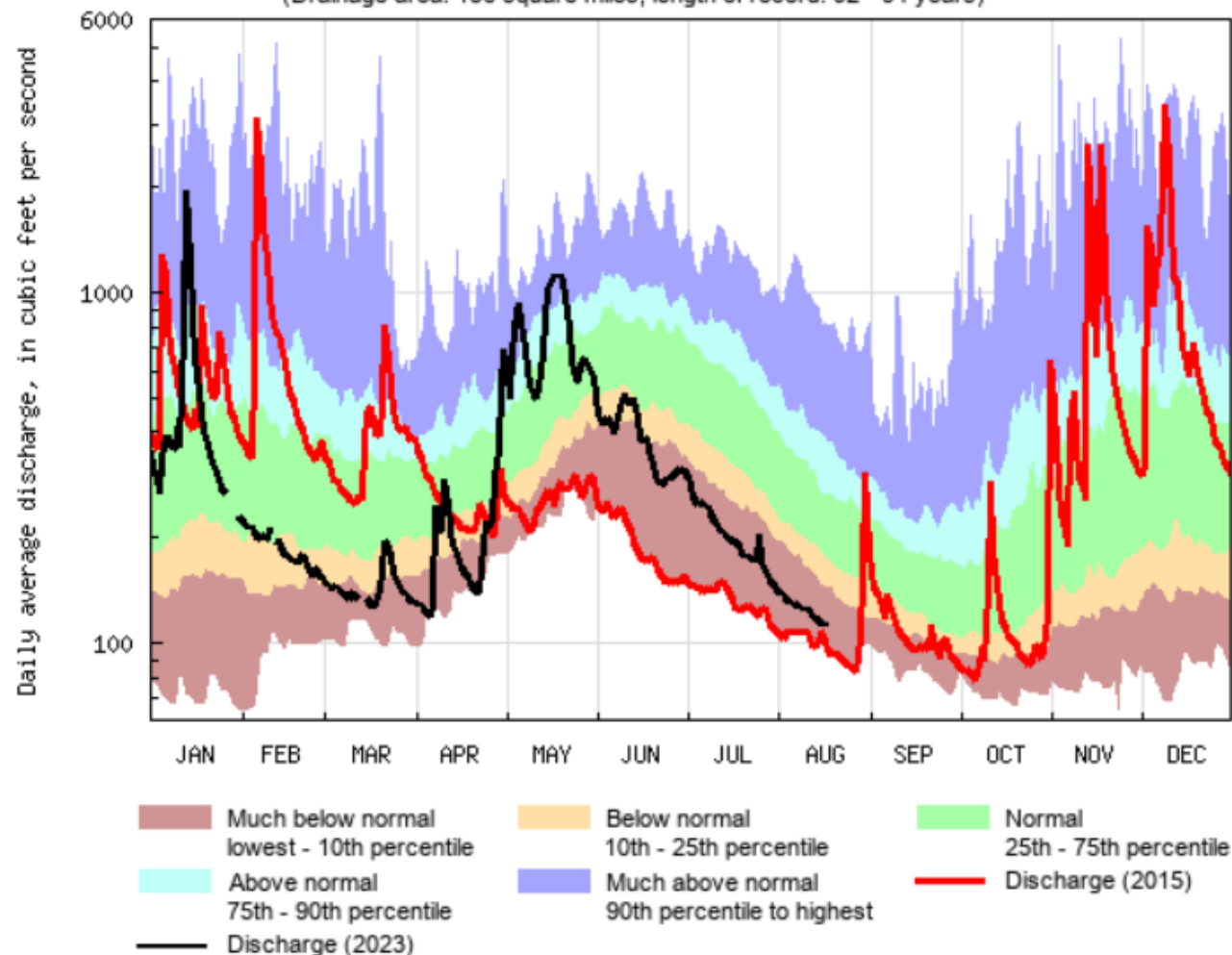
Saturday, August 15, 2015



USGS

| 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 | | |

USGS 12048000 DUNGENESS RIVER NEAR SEQUIM, WA
(Drainage area: 156 square miles, length of record: 92 - 94 years)

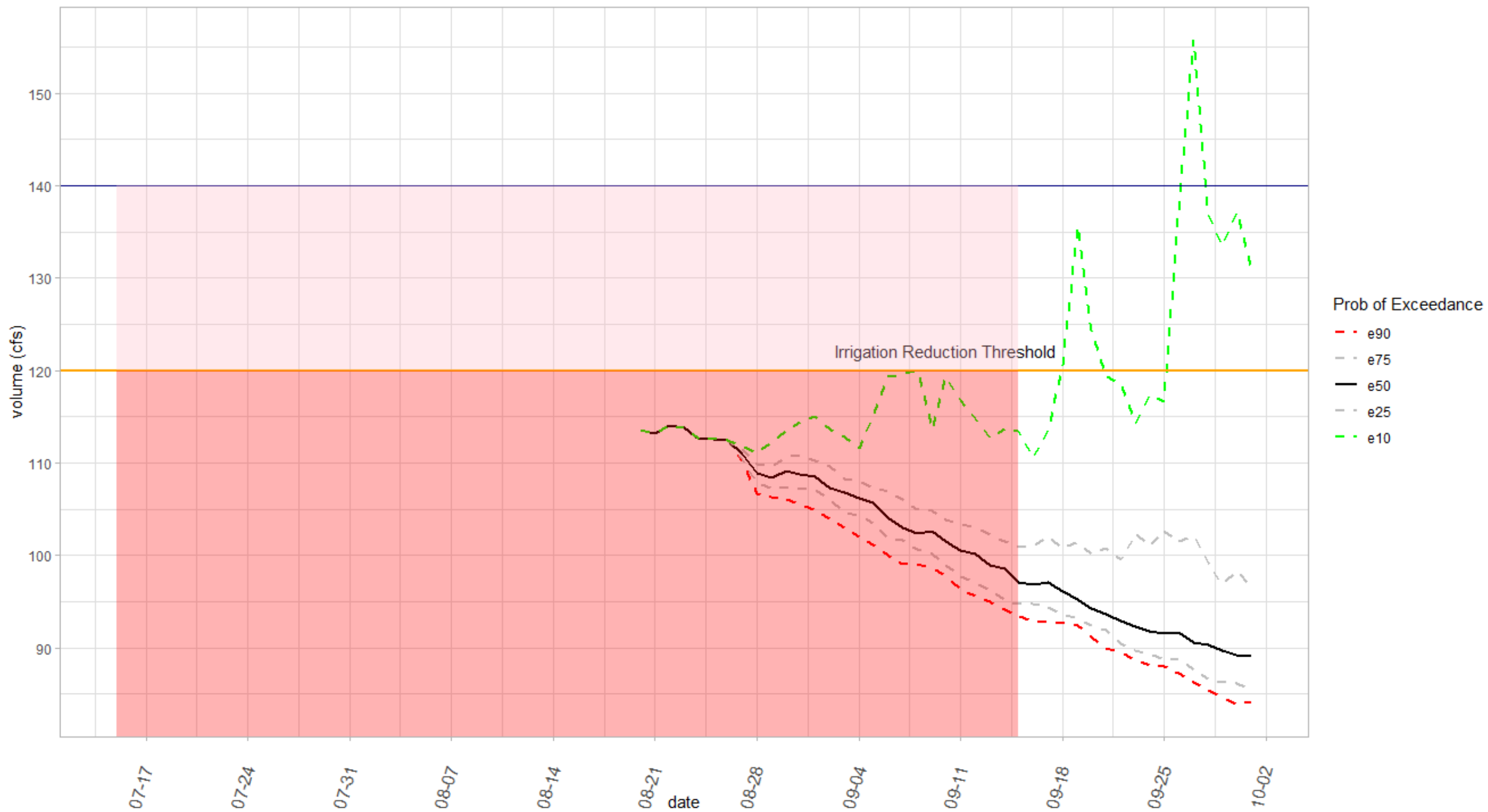


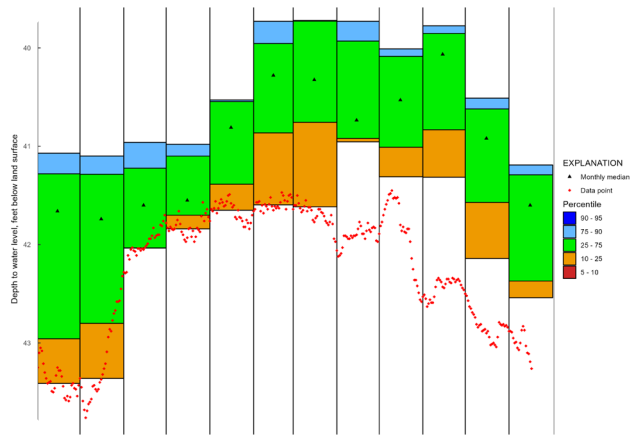
USGS WaterWatch

Last updated: 2023-08-18

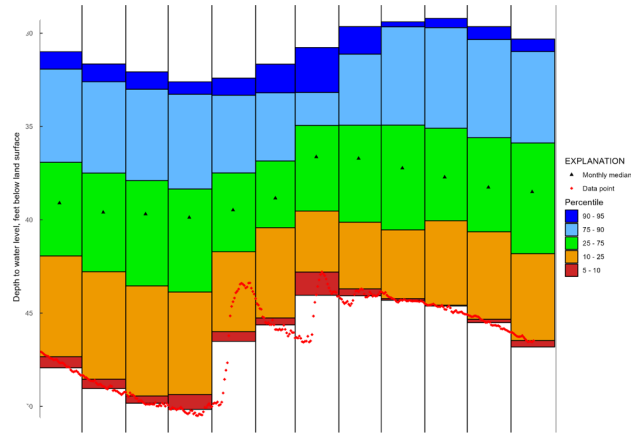
| Explanation - Percentile classes | | | | | |
|----------------------------------|--------------|--------|--------------|---------------------------|------|
| lowest-10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile - highest | Flow |
| Much below normal | Below normal | Normal | Above normal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

ensemble forecast for DUNGENESS NEAR SEQUIM

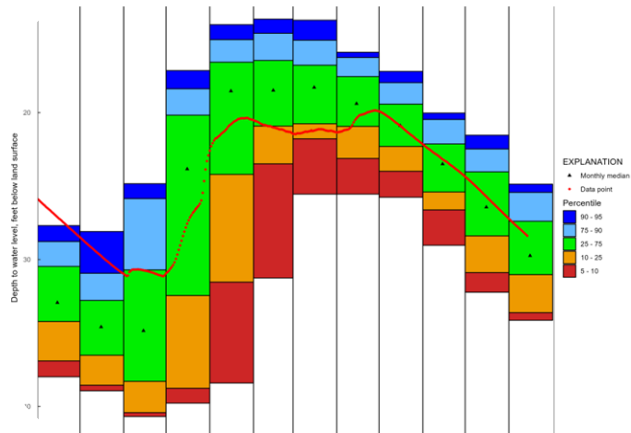




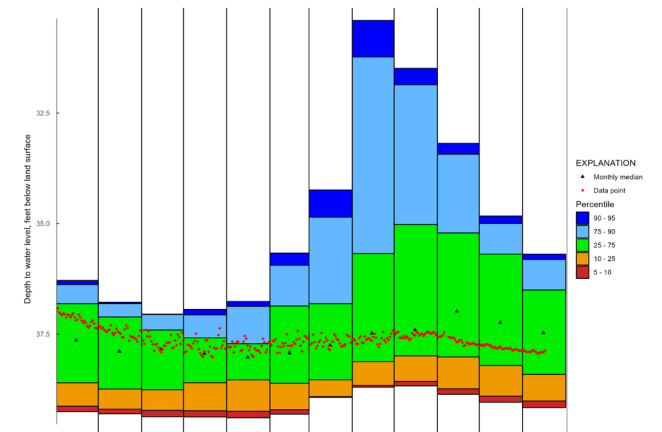
Clallam County nr Dungeness
River, Puget Sound Aquifer –
Quaternary Alluvium, 289 feet,
480546123100901



Lincoln County nr Davenport,
Wanapum Basalt, 117 feet,
473442118162201



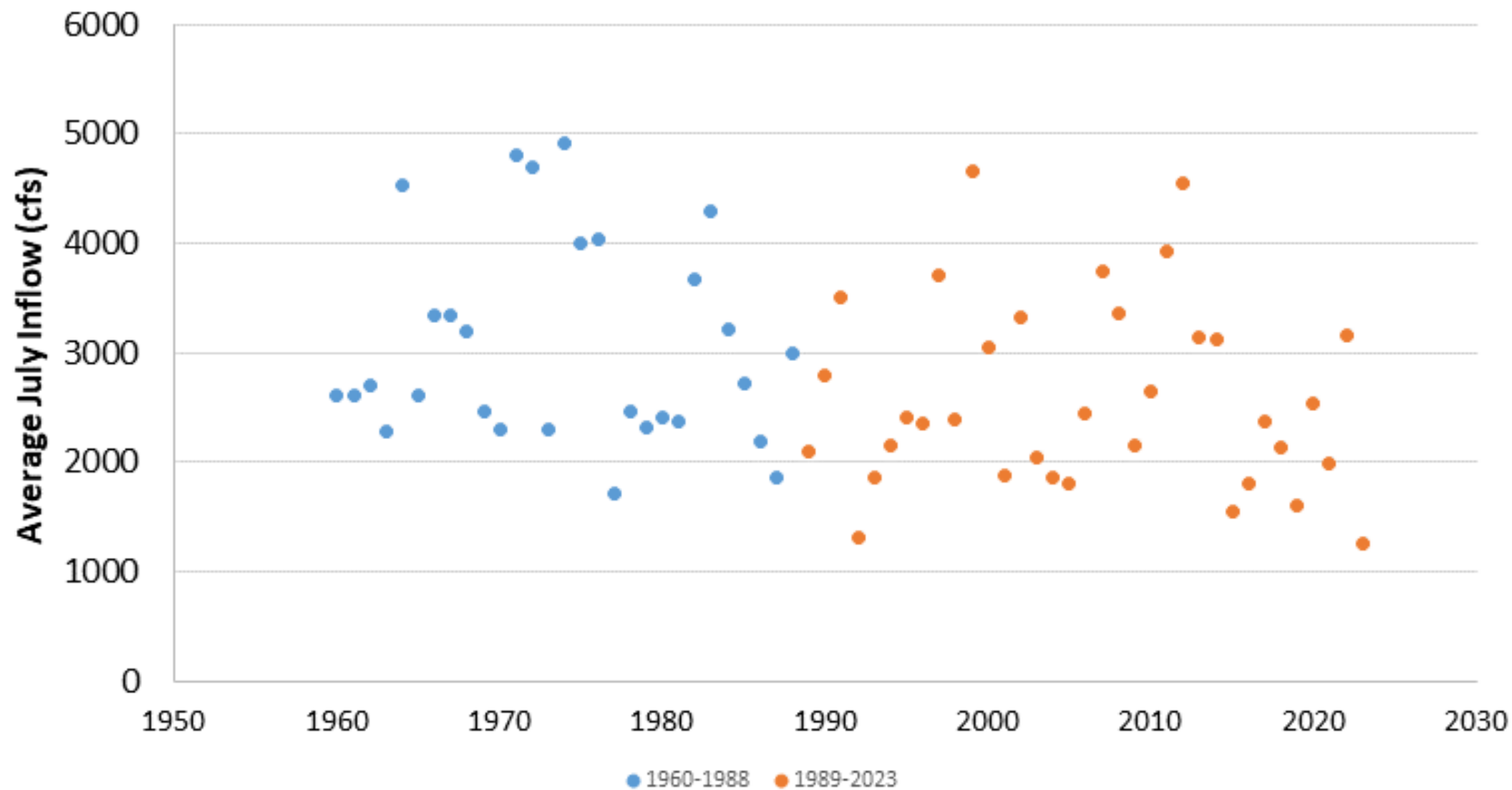
Thurston County, Scatter Creek,
Sand and Gravel Aquifer, 82 feet
465033122570202



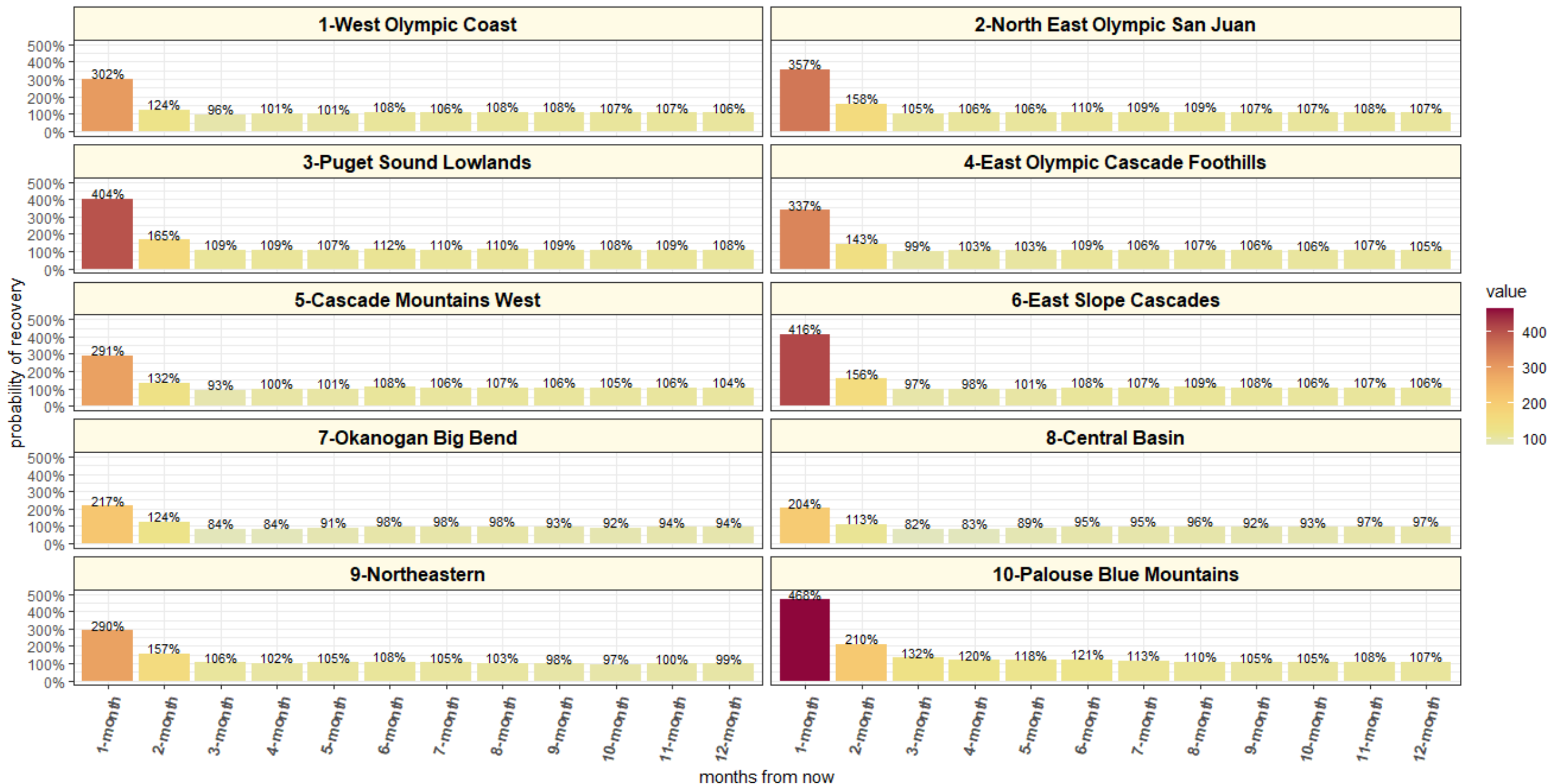
Columbia County nr Waitsburg,
Grand Ronde Basalt, 172 ft
461935118081501

Stop here.

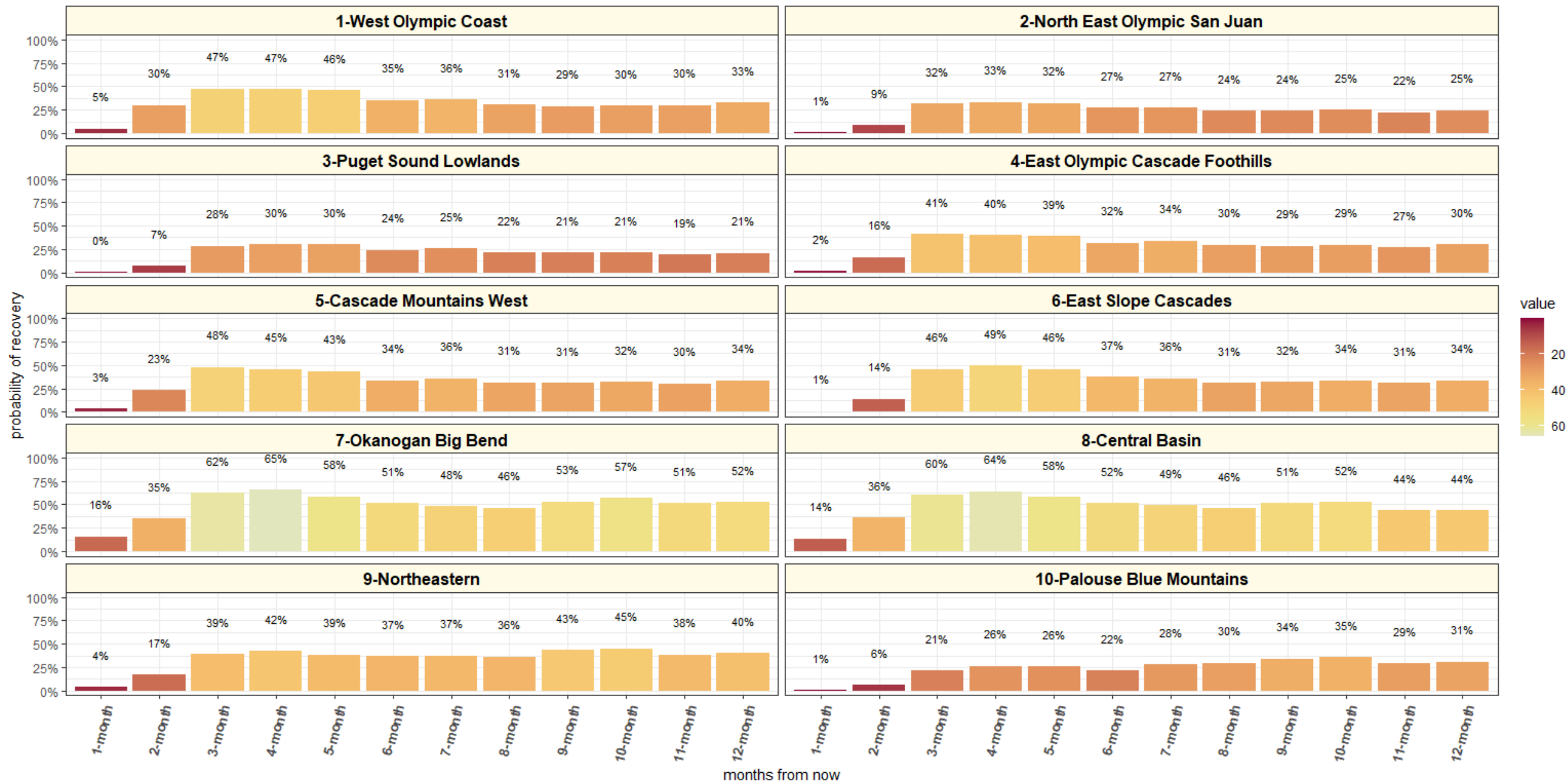
July Average Inflows to Baker Lake



Percent precipitation required to end drought | 2023-08-17



Probability of recovery from drought | 2023-08-17



Data: NOAA Drought Termination Tool

Assumes climatological conditions for the remainder of the month.

Monthly timesteps are not interdependent.

A drought is considered to be ameliorated when the PHDI is raised to -2.0, and ended when above -0.5.



Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

 Search



CONSERVATION BASICS

GETTING ASSISTANCE

PROGRAMS & INITIATIVES

RESOURCES

NEWS & EVENTS

CONTACT

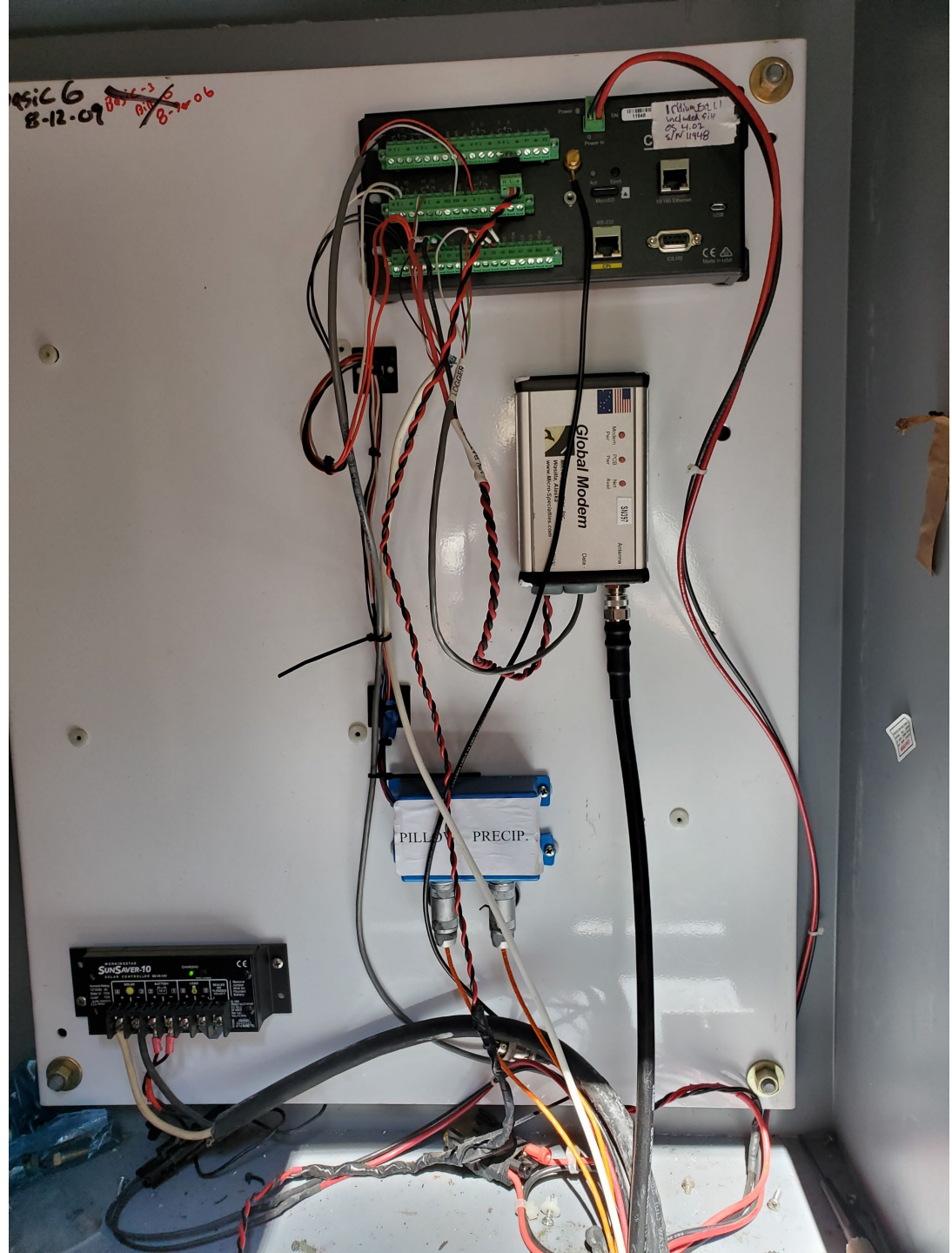
Washington Snow Survey & Water Supply Program

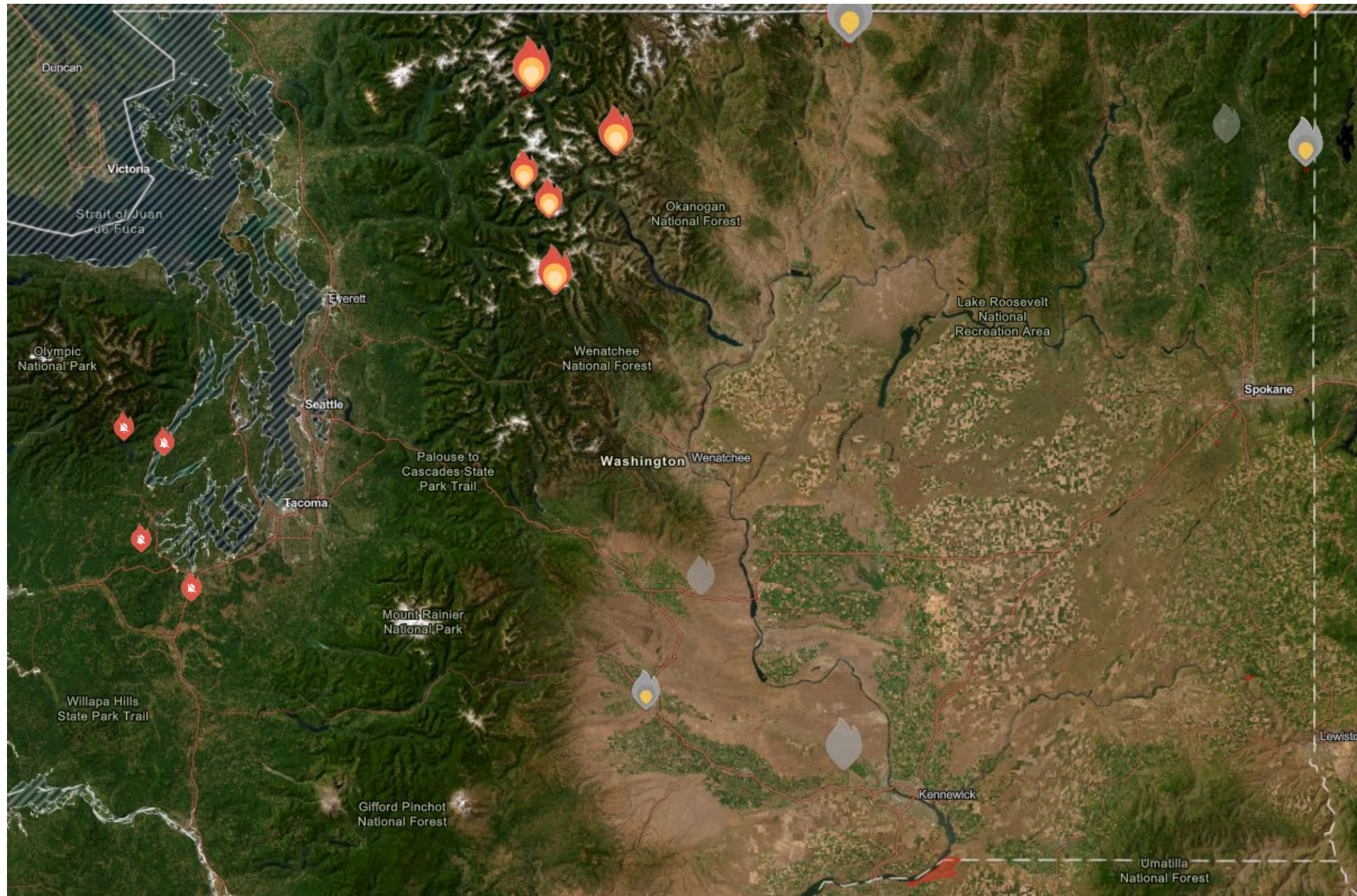
WSAC August 2023

[Home](#) > [Conservation Basics](#) > [Conservation By State](#) > [Washington](#) > [Washington Snow Survey & Water Supply Program](#)

The NRCS Snow Survey Program provides mountain snowpack data and streamflow forecasts for the western United States. Applications of snow survey products include water supply management, flood control, climate modeling, recreation, and







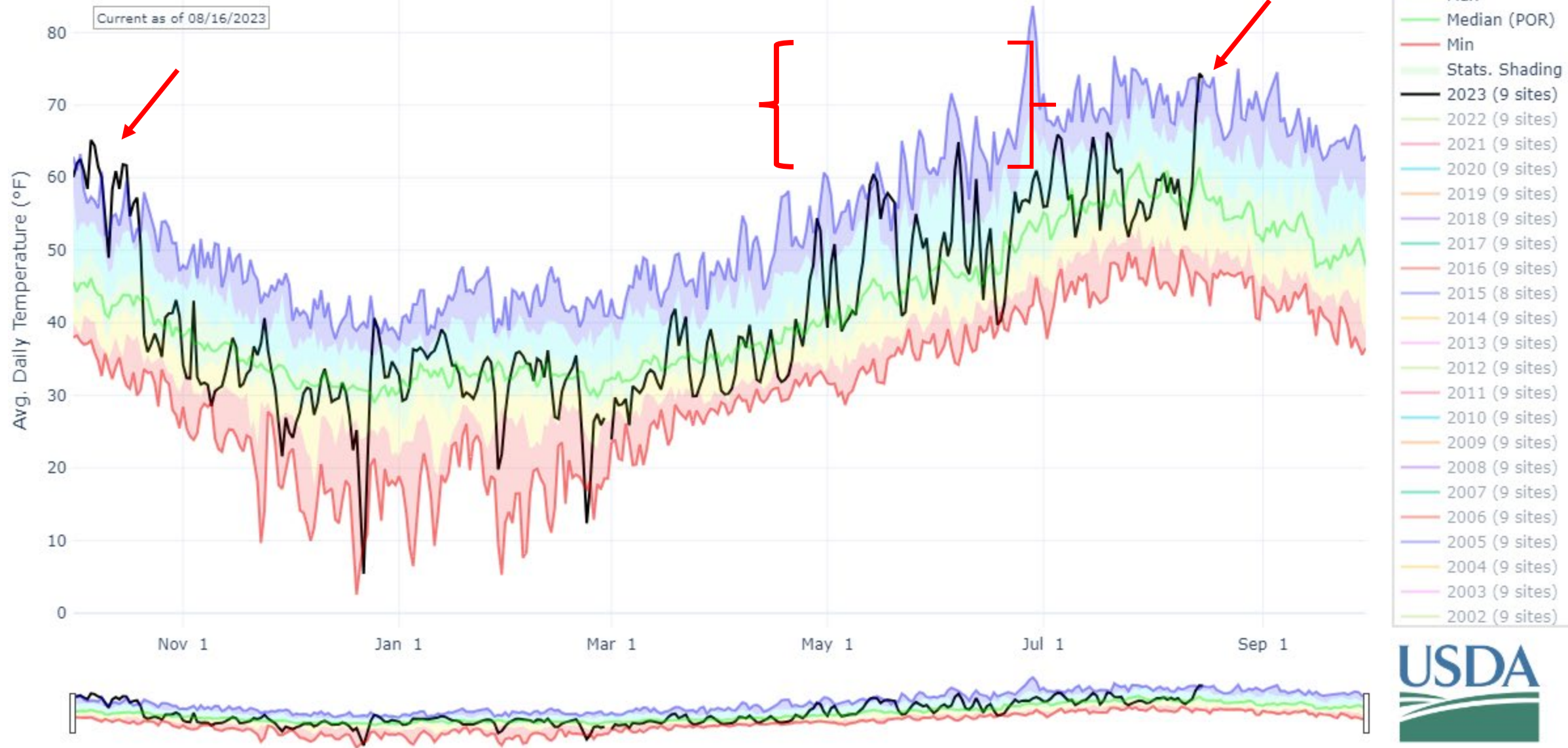


DAILY AVERAGE TEMPERATURE IN CENTRAL PUGET SOUND

Reset Range

Link to data: CSV / JSON

Station List

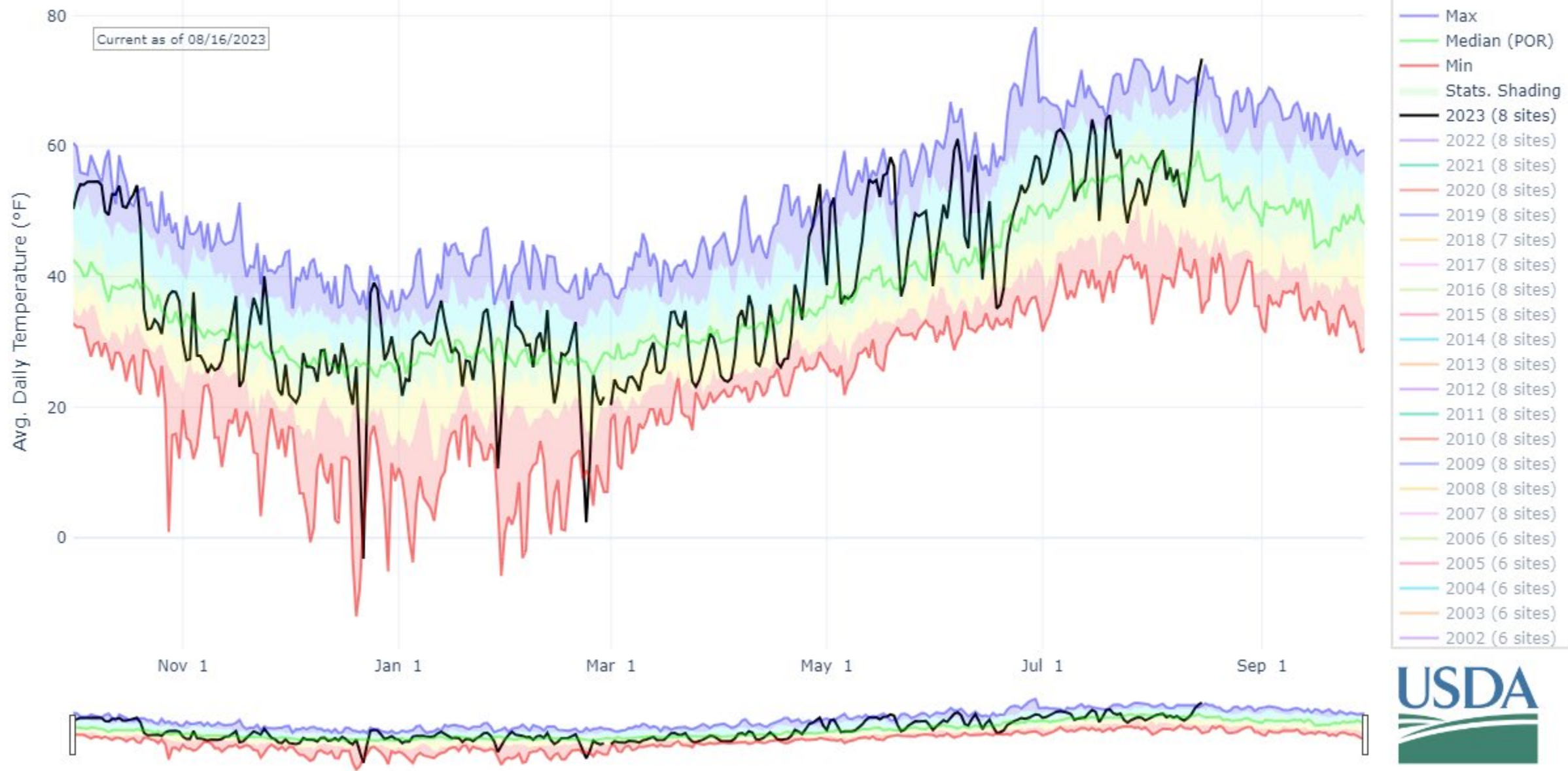


DAILY AVERAGE TEMPERATURE IN NACHES

Reset Range

[Link to data: CSV / JSON](#)

Station List



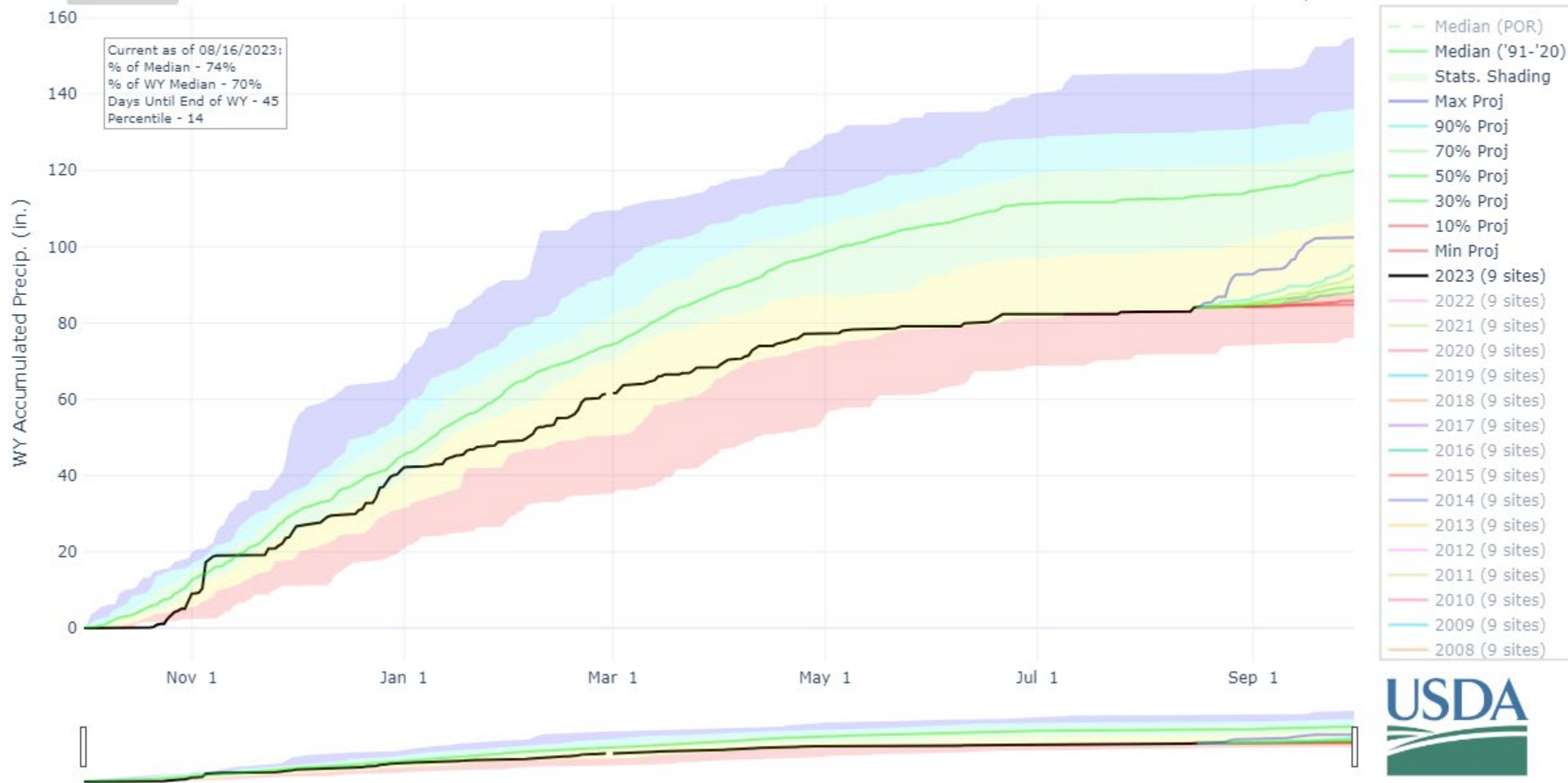
PRECIPITATION PROJECTIONS IN CENTRAL PUGET SOUND

Reset Range

[Link to data: CSV / JSON](#)

Station List

Current as of 08/16/2023:
% of Median - 74%
% of WY Median - 70%
Days Until End of WY - 45
Percentile - 14

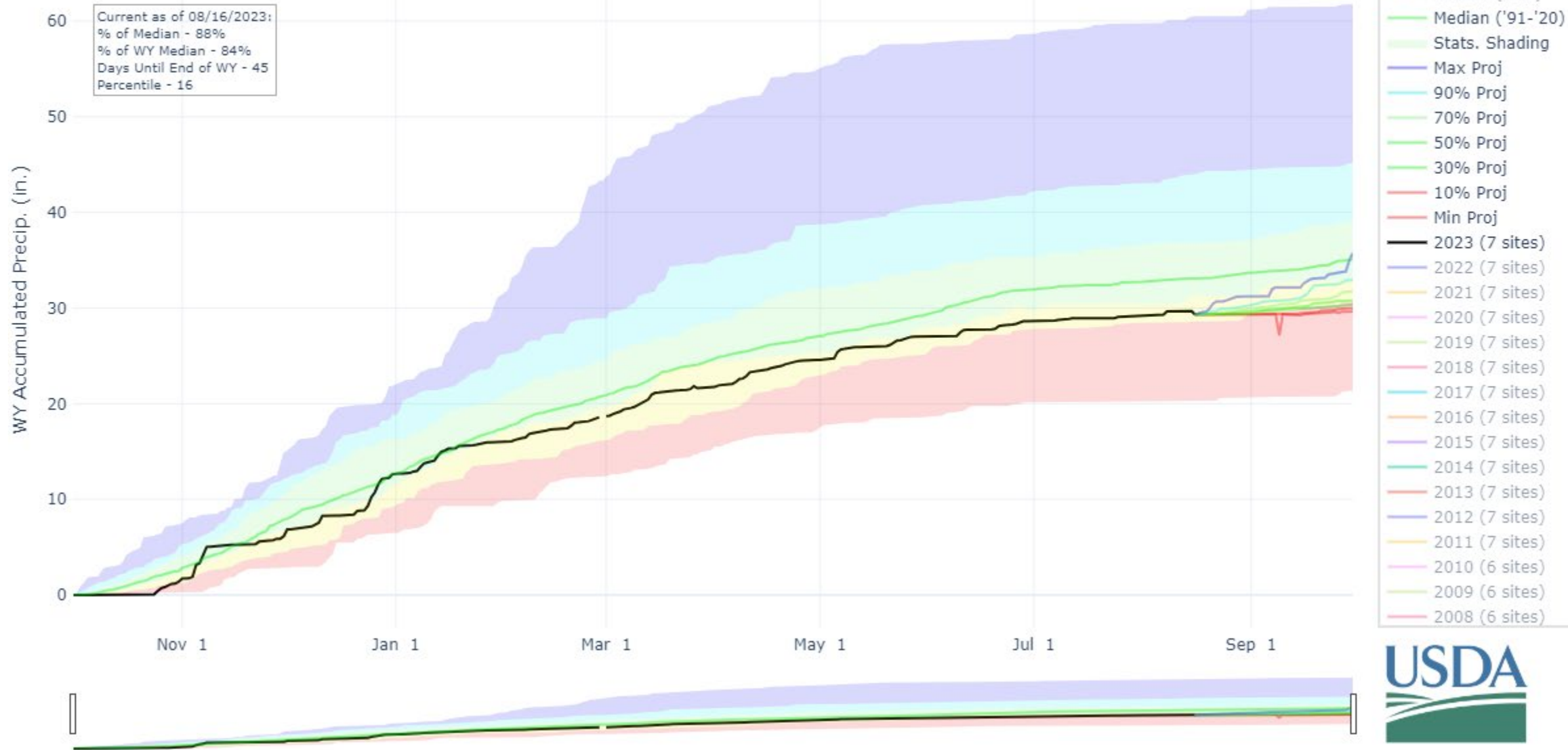


PRECIPITATION PROJECTIONS IN UPPER COLUMBIA

Reset Range

[Link to data: CSV / JSON](#)

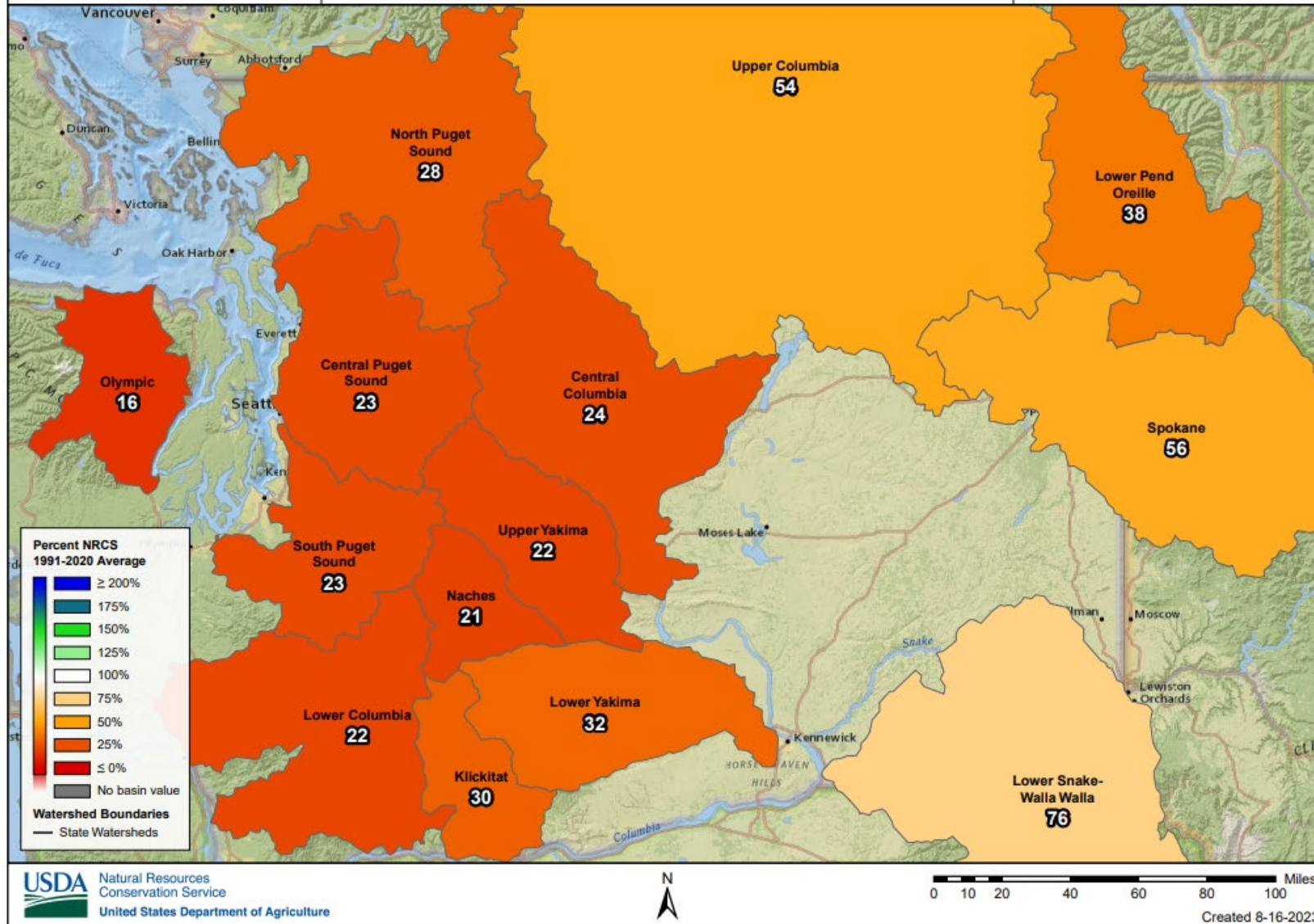
Station List



116 day Precipitation

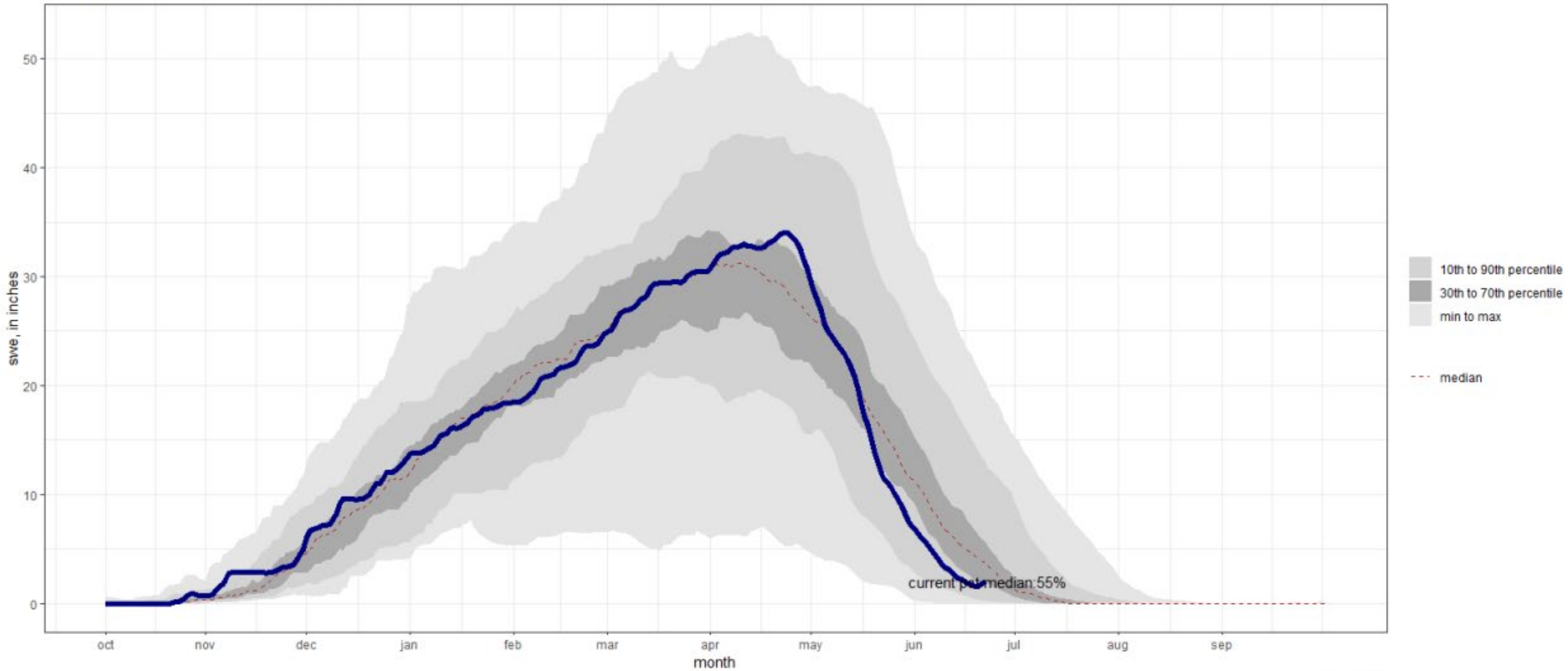
Percent NRCS 1991-2020 Average

July 1, 2022 - October 24, 2022



Washington State SWE (SNOTEL)

POR: 1989-10-01 - 2023-06-22 Created on: 2023-06-22

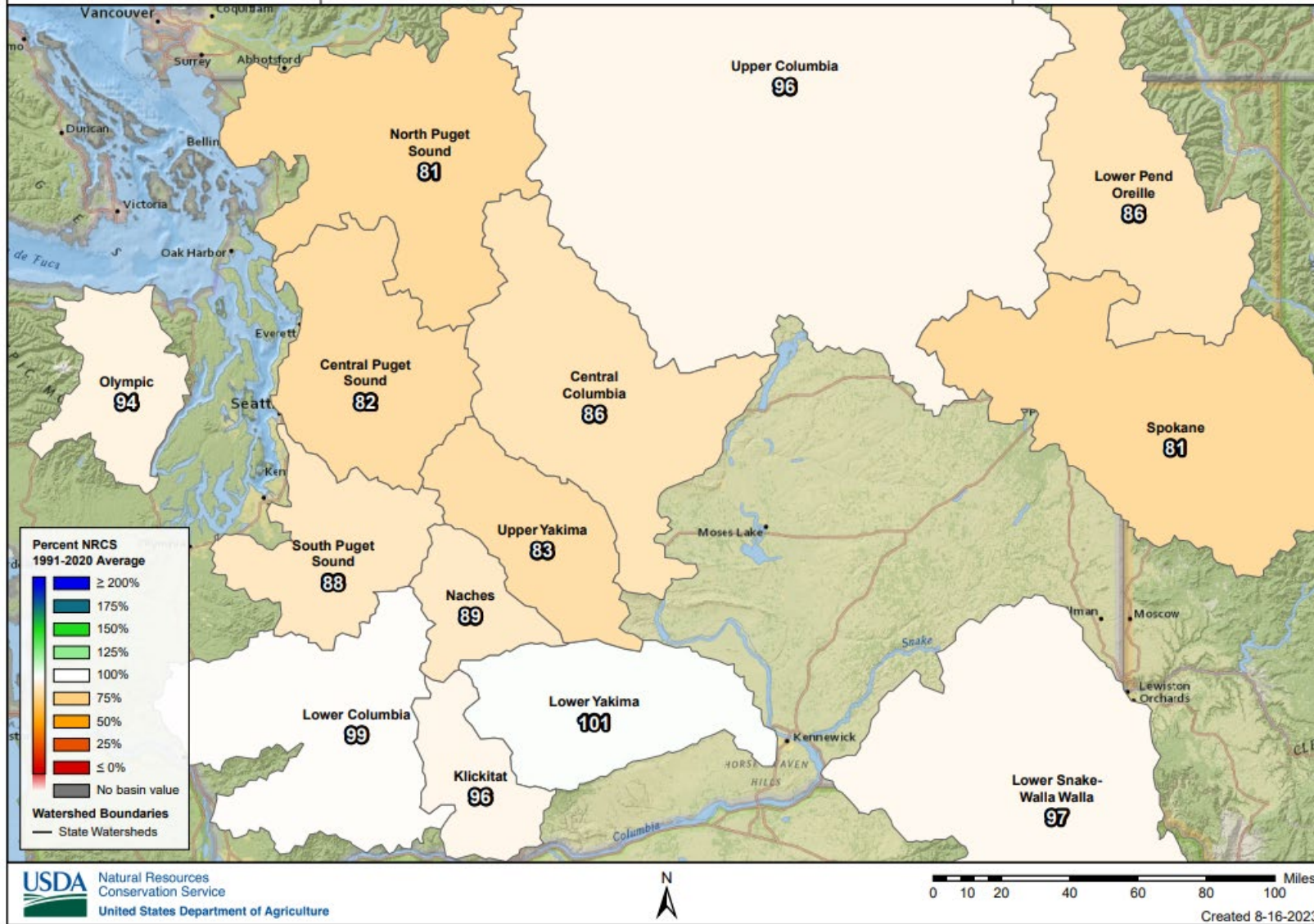


Data: NRCS

6 month Precipitation

Percent NRCS 1991-2020 Average

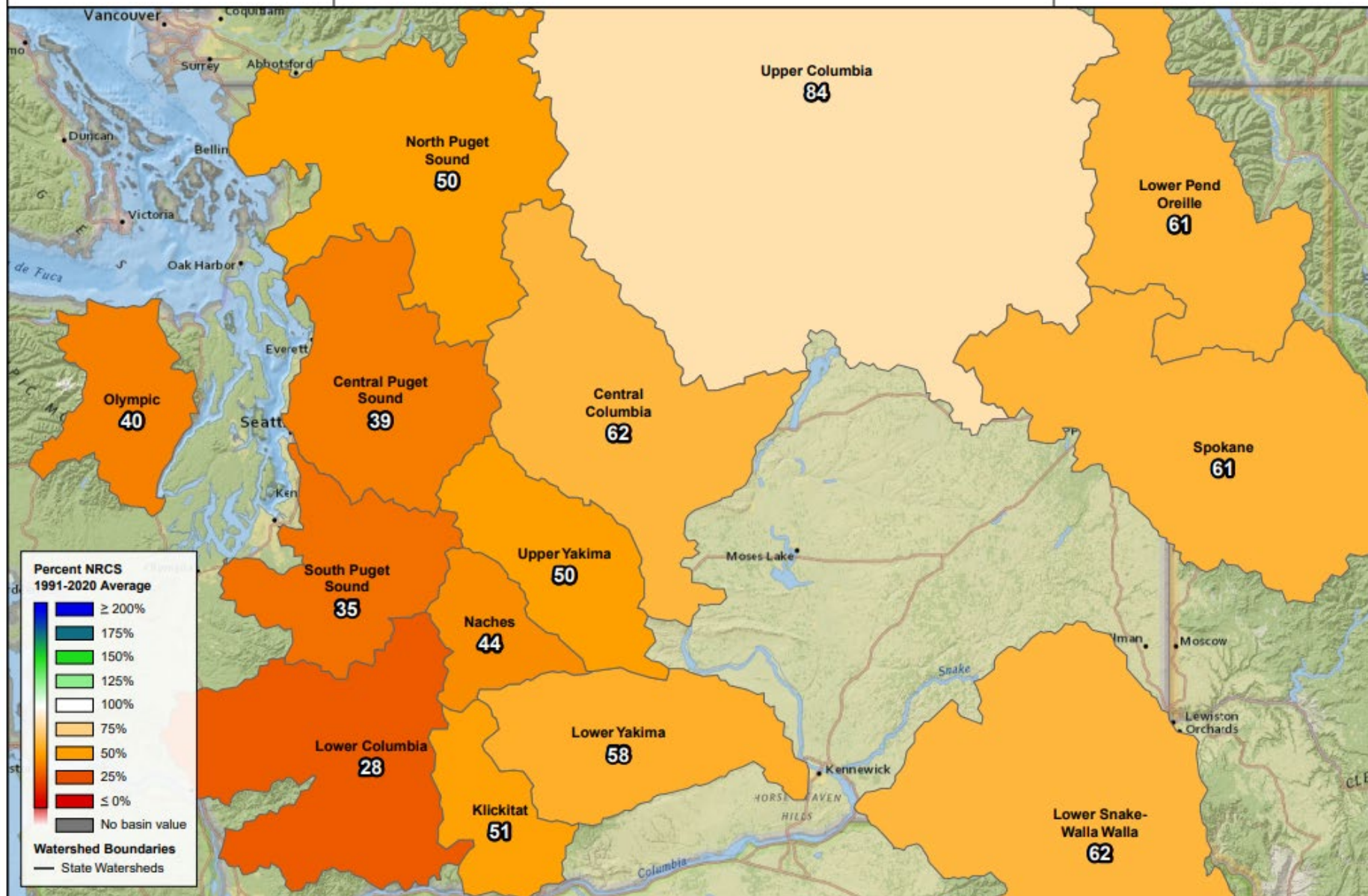
November 1, 2022 - April 30, 2023



107 day Precipitation

Percent NRCS 1991-2020 Average

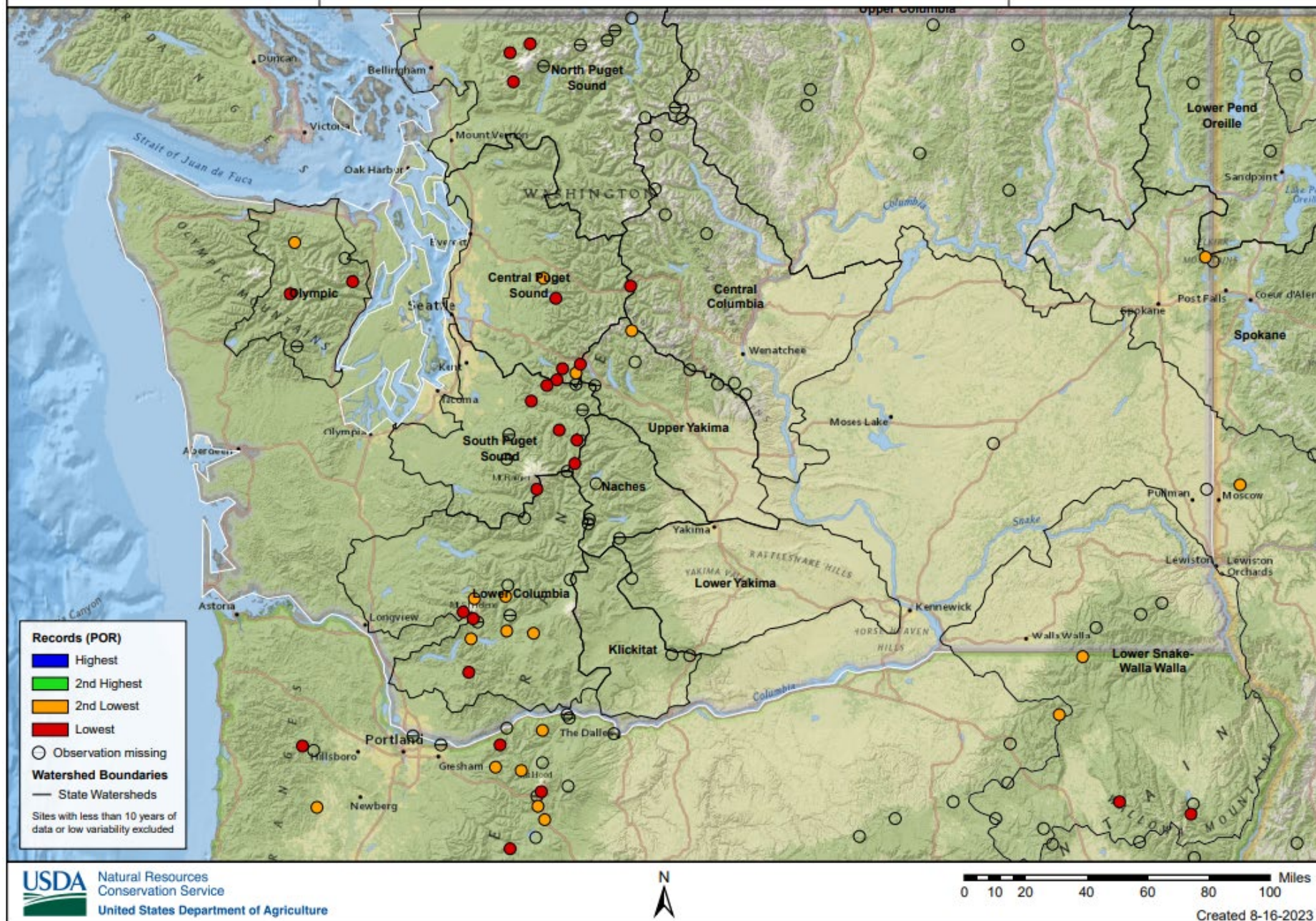
May 1, 2023 - August 15, 2023



107 day Precipitation

Records (POR)

May 1, 2023 - August 15, 2023

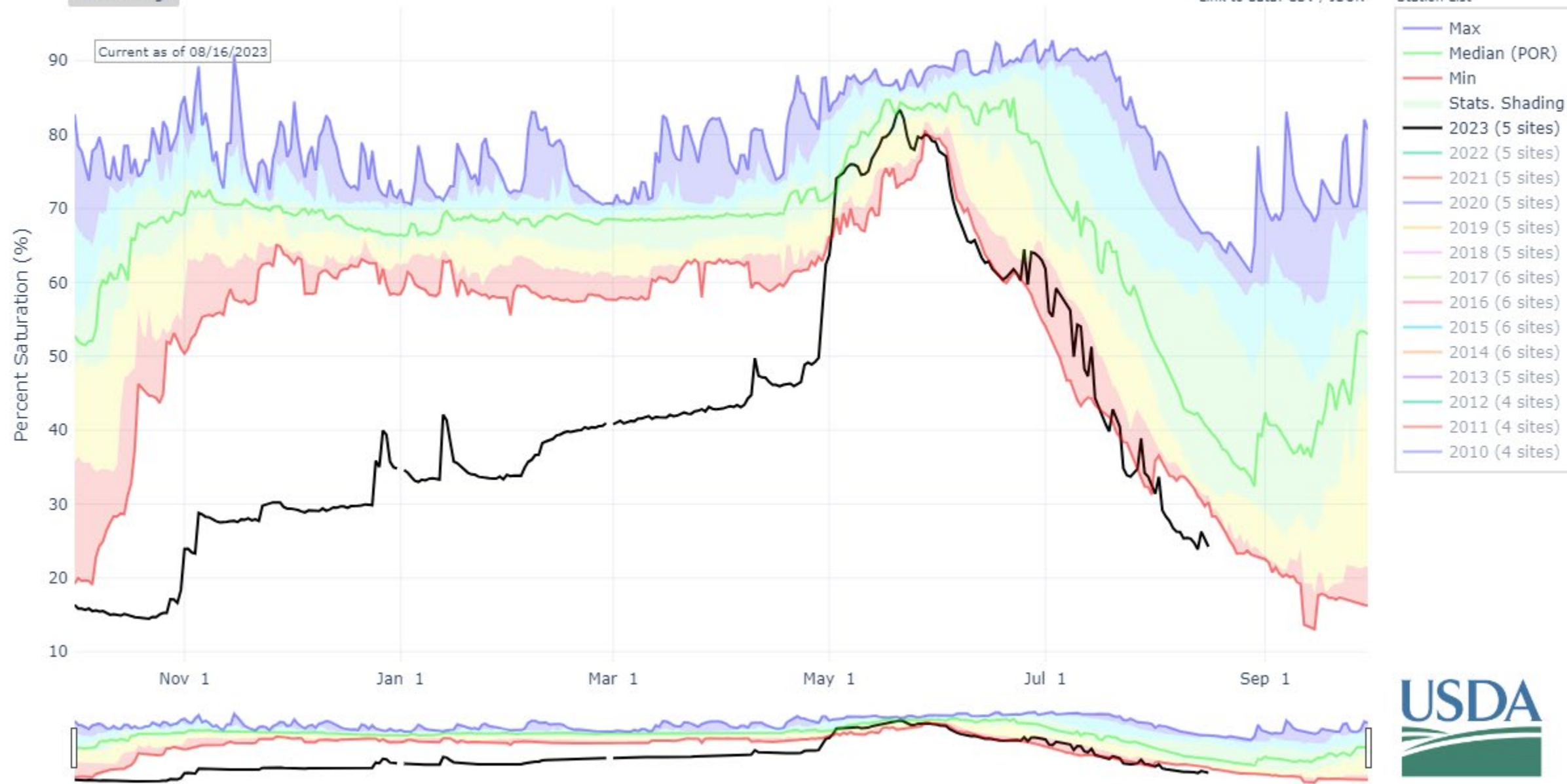


DEPTH AVERAGED SOIL SATURATION IN NORTH PUGET SOUND

Reset Range

[Link to data: CSV / JSON](#)

Station List

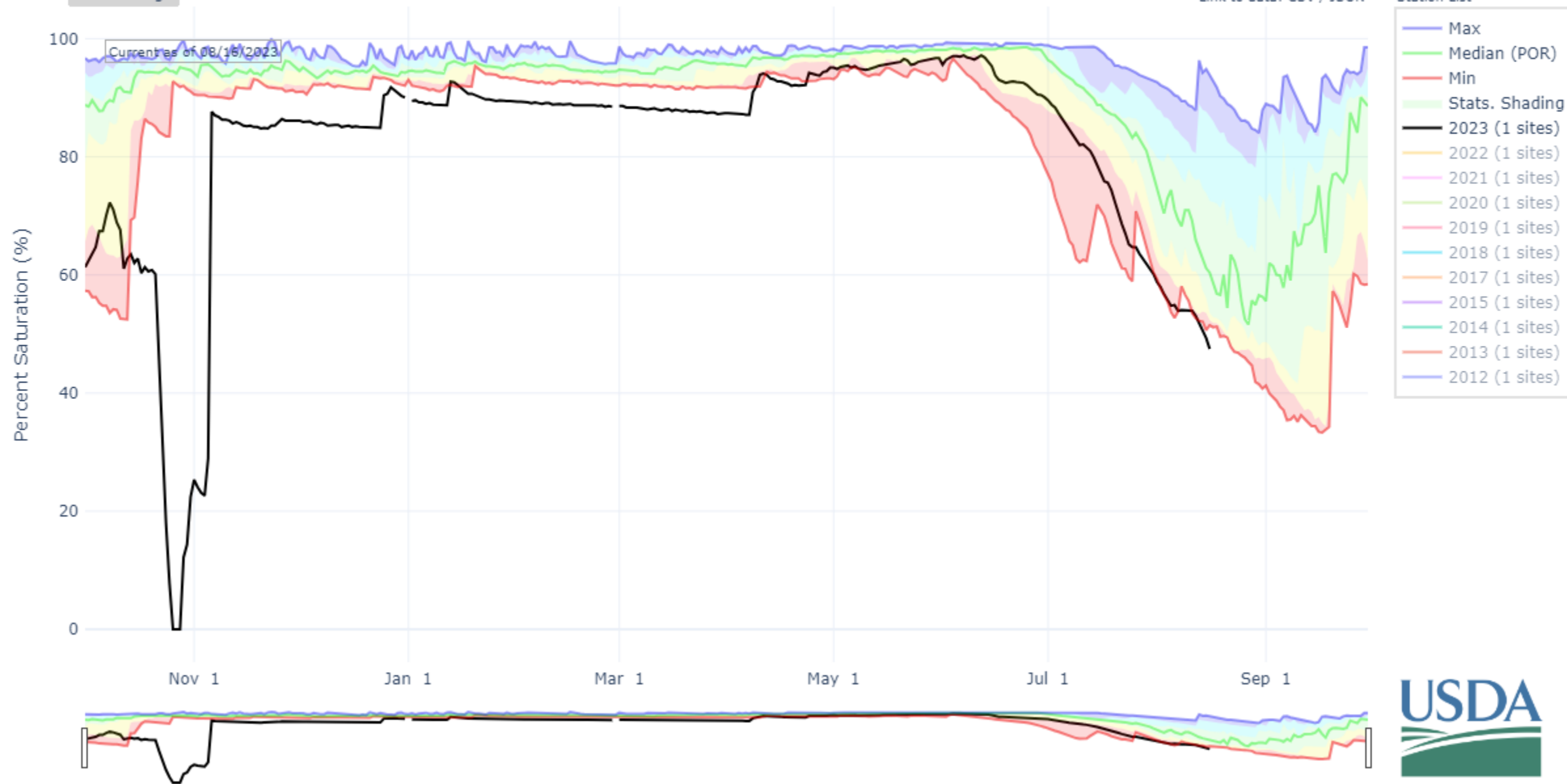


DEPTH AVERAGED SOIL SATURATION IN NACHES

Reset Range

[Link to data: CSV / JSON](#)

Station List

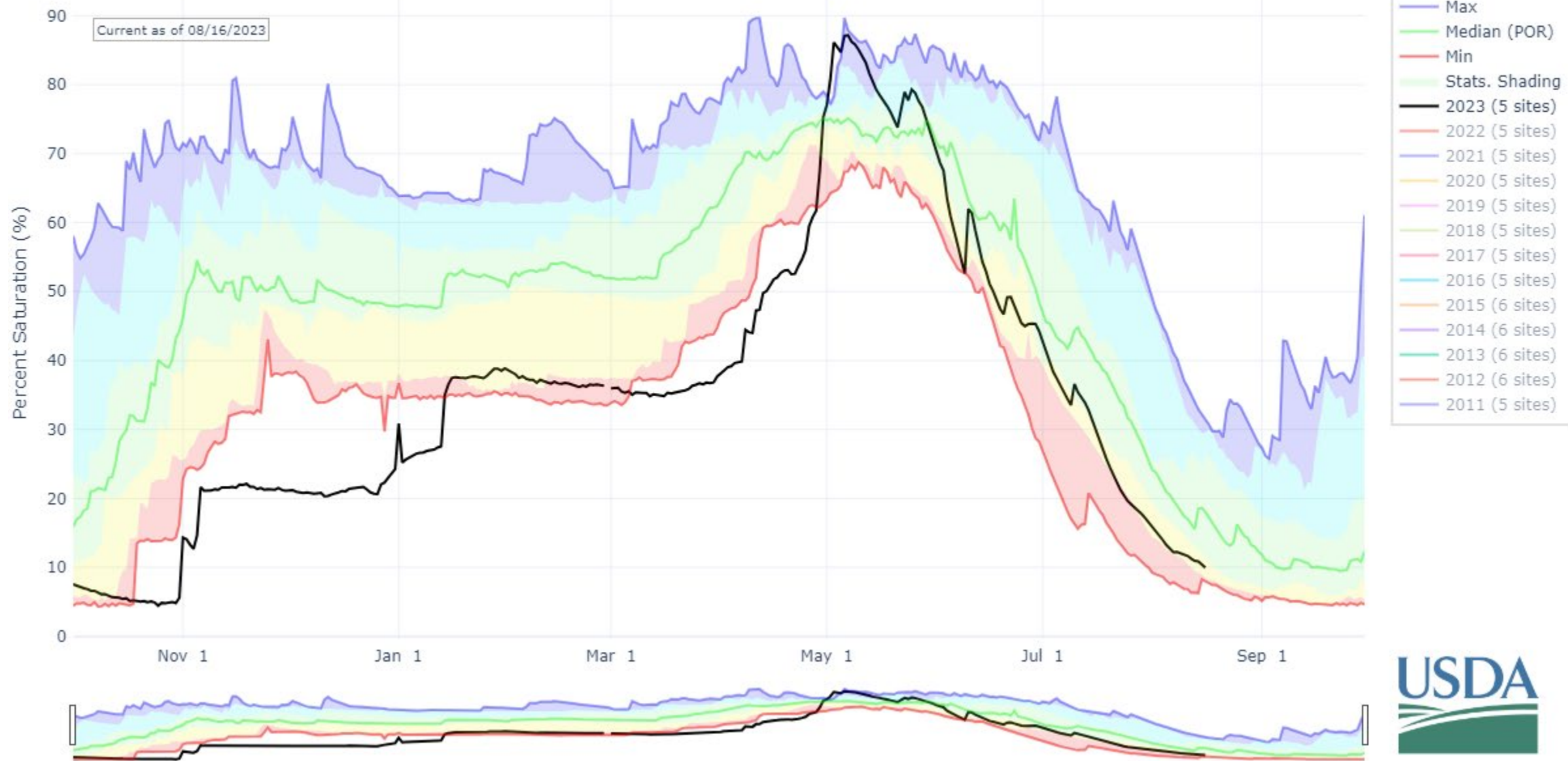


DEPTH AVERAGED SOIL SATURATION IN UPPER COLUMBIA

Reset Range

[Link to data: CSV / JSON](#)

Station List







Questions?



Office of the Washington State Climatologist



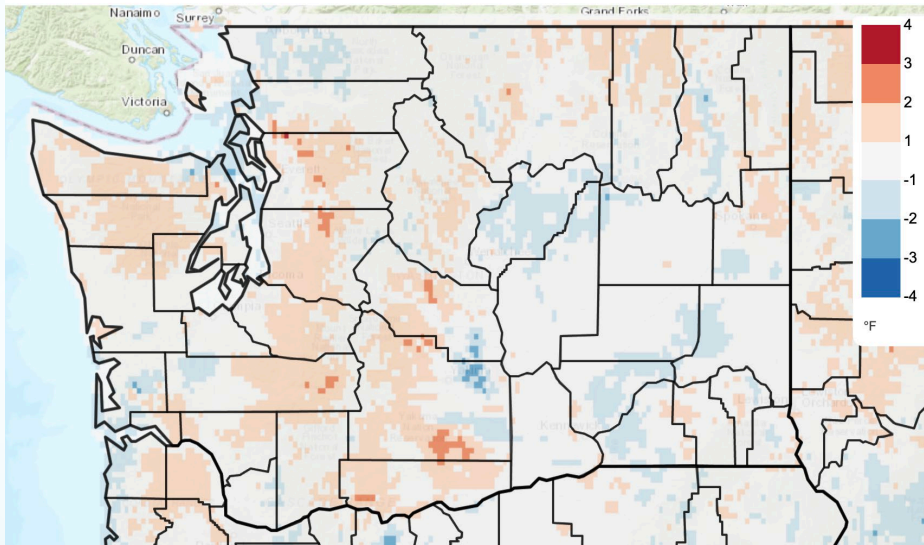
Current Conditions and Seasonal Outlook

Nick Bond & Karin Bumbaco
Office of the Washington State Climatologist
Climate Impacts Group
University of Washington
18 August 2023

Water Year 2023

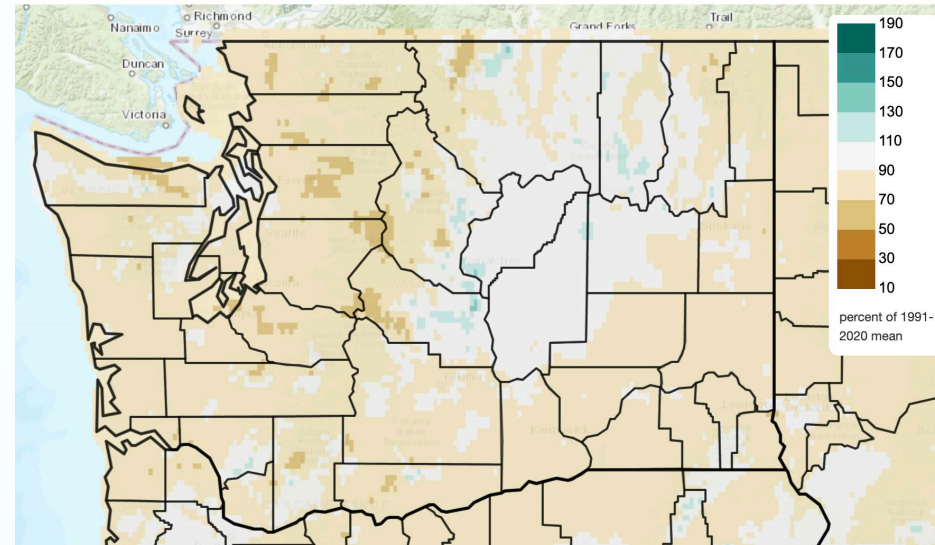
Temperature

Mean Daily Temperature Anomaly, Since Oct 1st
2022/10/01 - 2023/08/14



Precipitation

Total Precipitation Anomaly, Since Oct 1st
2022/10/01 - 2023/08/14



Climate Toolbox

- Averaged statewide, Oct-Jul temperatures were near-normal ($+0.2^{\circ}\text{F}$ above 1991-2020 normal)
- Averaged statewide, Oct-Jul precipitation ranks as the 17th driest ($-7.22''$)*, with 82% of normal

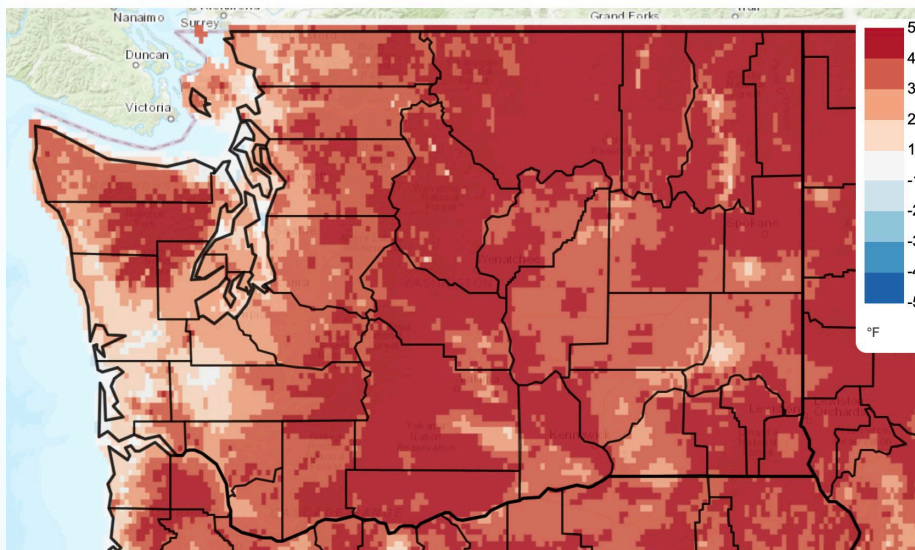
*Records since 1895; 1991-2020 normal

May-July 2023

Temperature

Mean Daily Temperature Anomaly, Last 3 Full Months

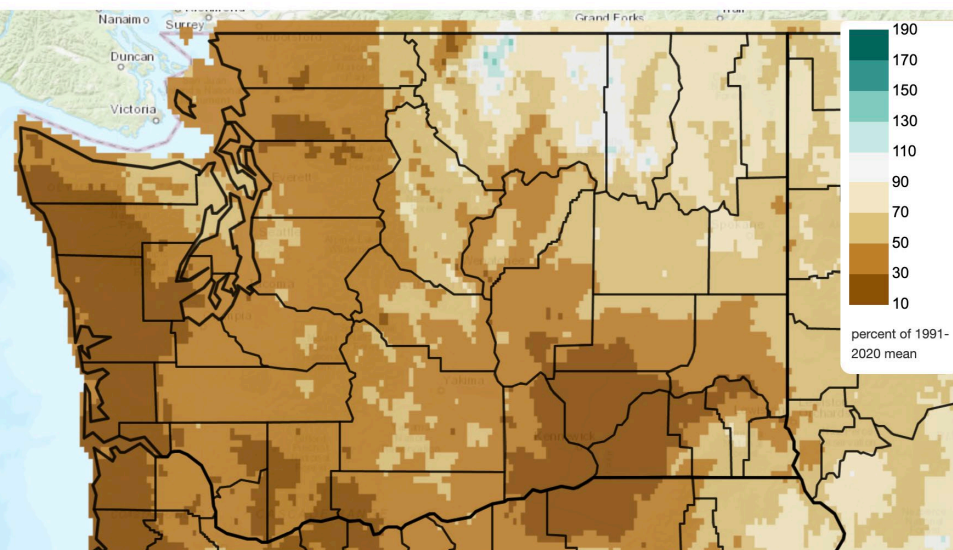
2023/05/01 - 2023/07/31



Precipitation

Total Precipitation Anomaly, Last 3 Full Months

2023/05/01 - 2023/07/31



Climate Toolbox

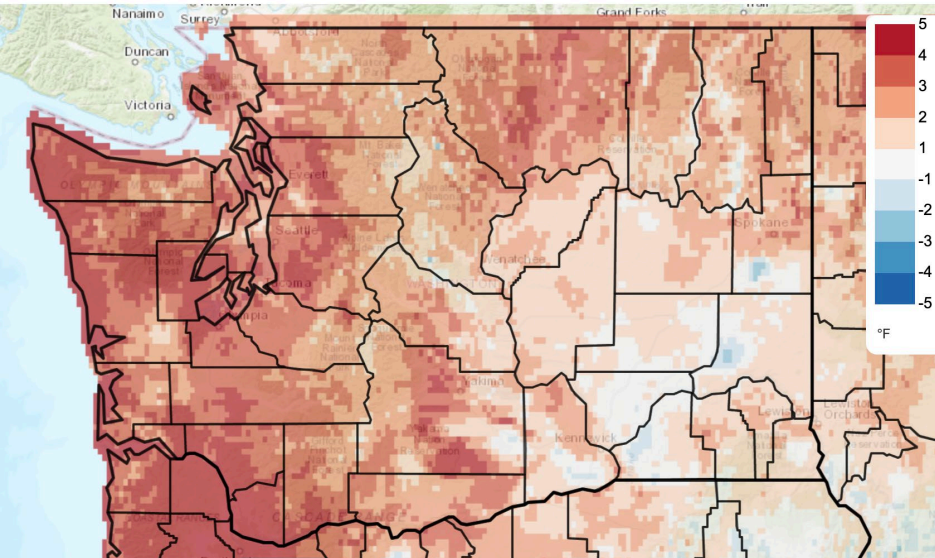
- Averaged statewide, May-July ranks as the 4th warmest on record (+3.3°F)*
- Averaged statewide, May-July was the 6th driest (-2.65") on record, with 49% of normal precipitation*

*Records since 1895; 1991-2020 normal

August 2023 so far...

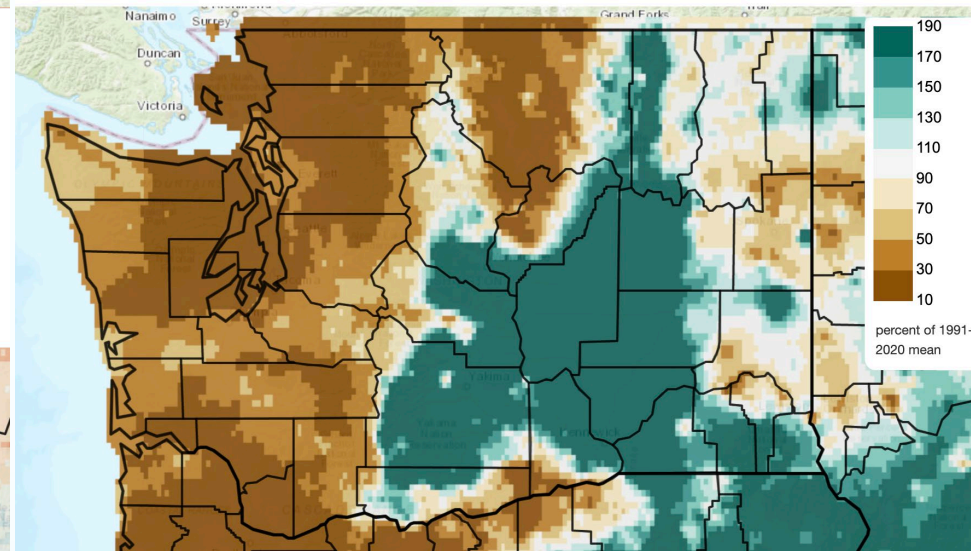
Temperature

Mean Daily Temperature Anomaly, Last 15 Days
2023/07/31 - 2023/08/14



Precipitation

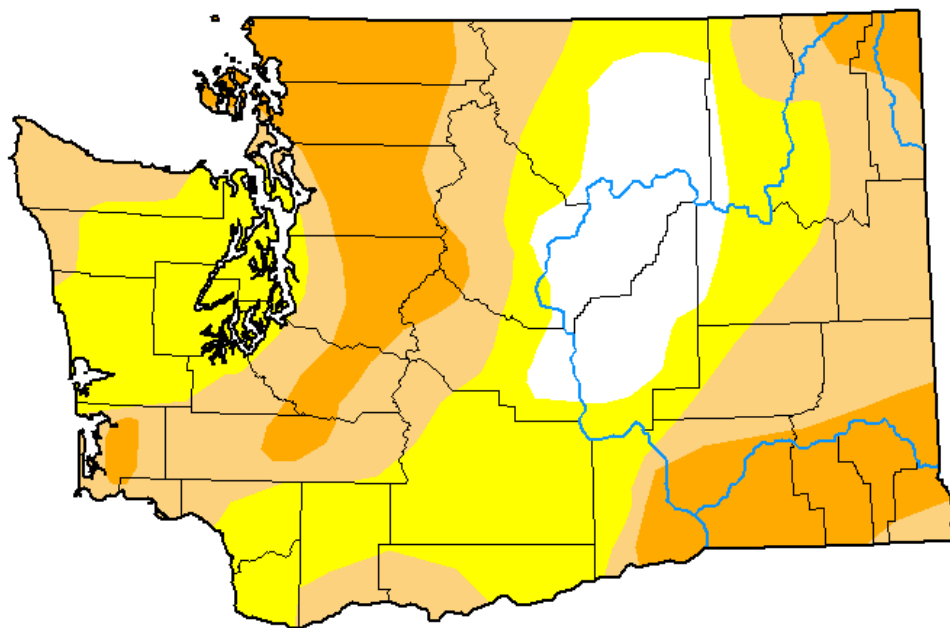
Total Precipitation Anomaly, Last 15 Days
2023/07/31 - 2023/08/14



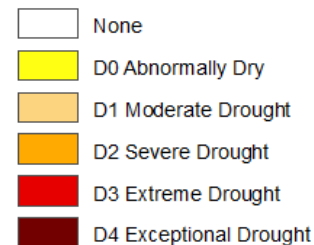
U.S. Drought Monitor

U.S. Drought Monitor Washington

August 15, 2023
(Released Thursday, Aug. 17, 2023)
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>

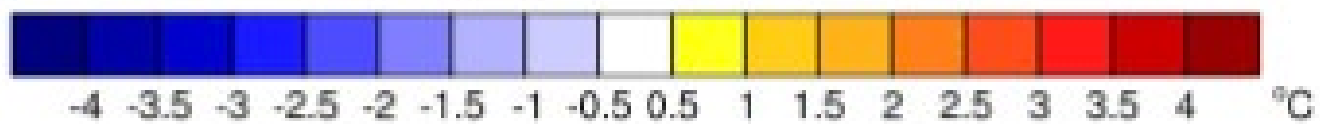
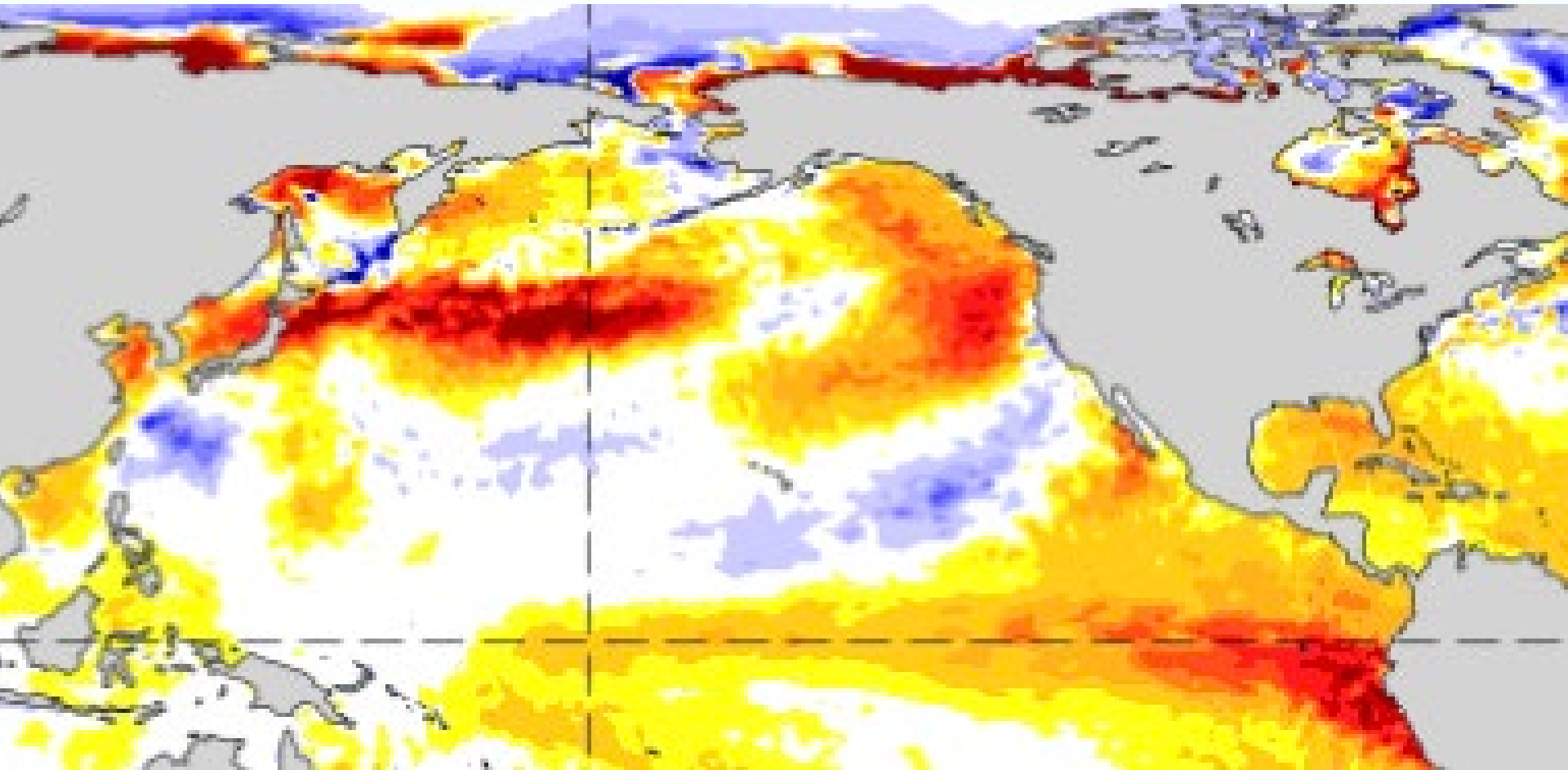
Author:

Lindsay Johnson
National Drought Mitigation Center

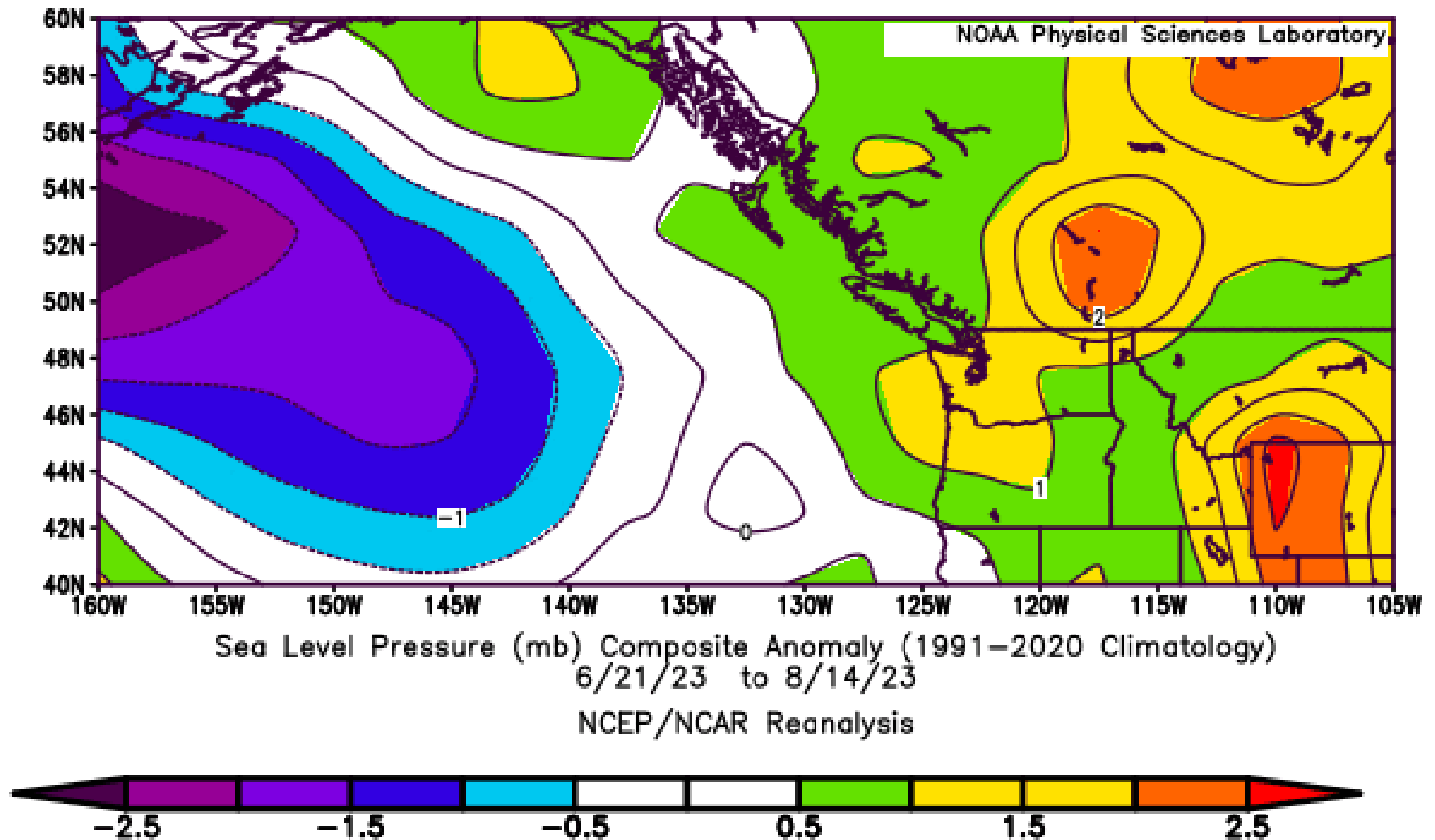


droughtmonitor.unl.edu

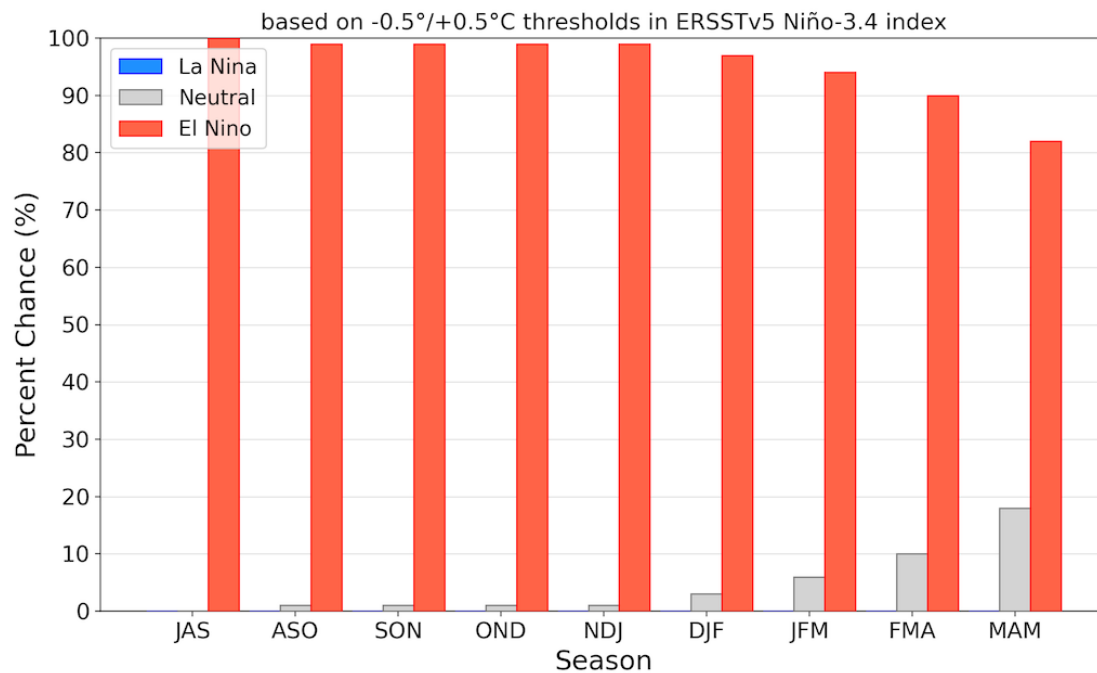
SST Anomalies – 6-12 August 2023



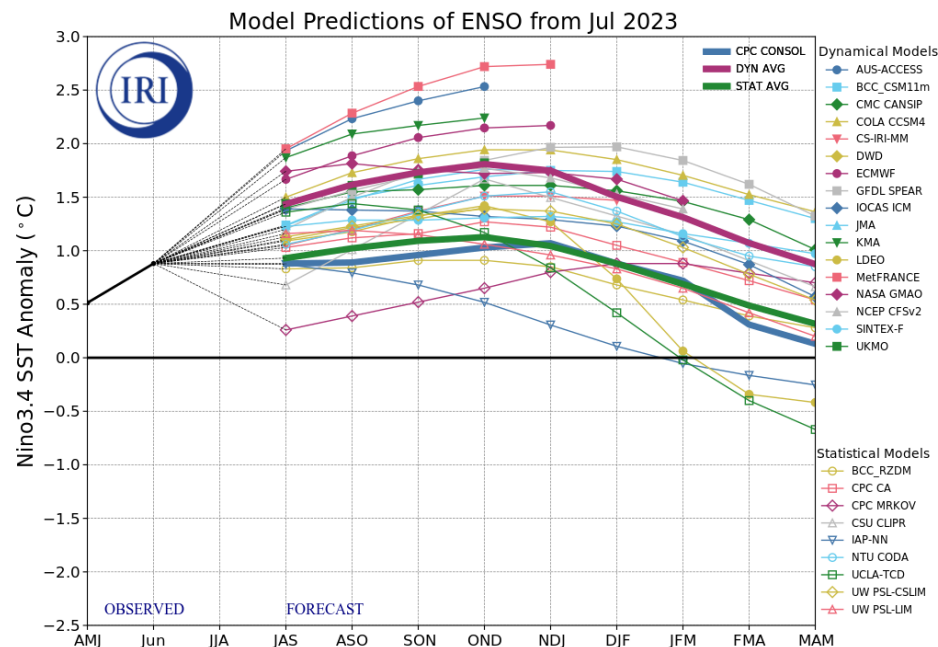
Offshore low pressure anomaly has
meant warm air temperatures and
reduced upwelling for our coastal waters



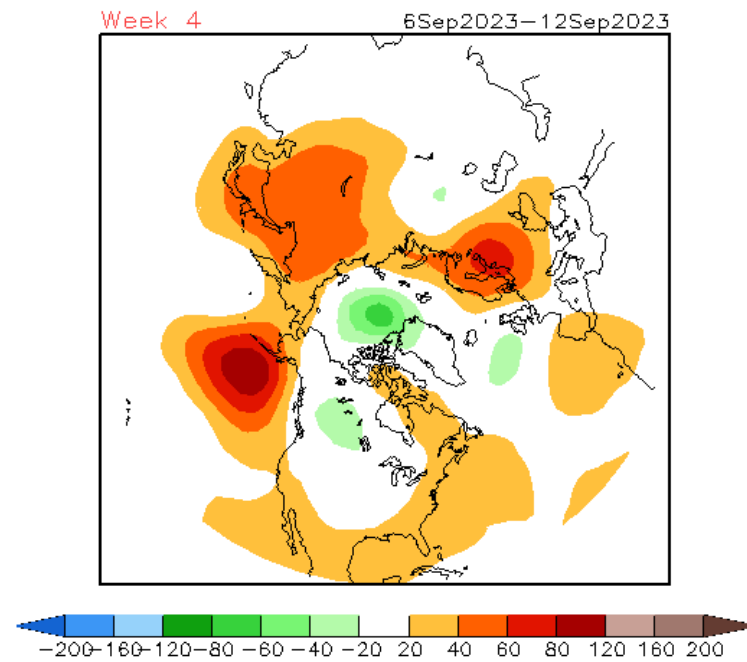
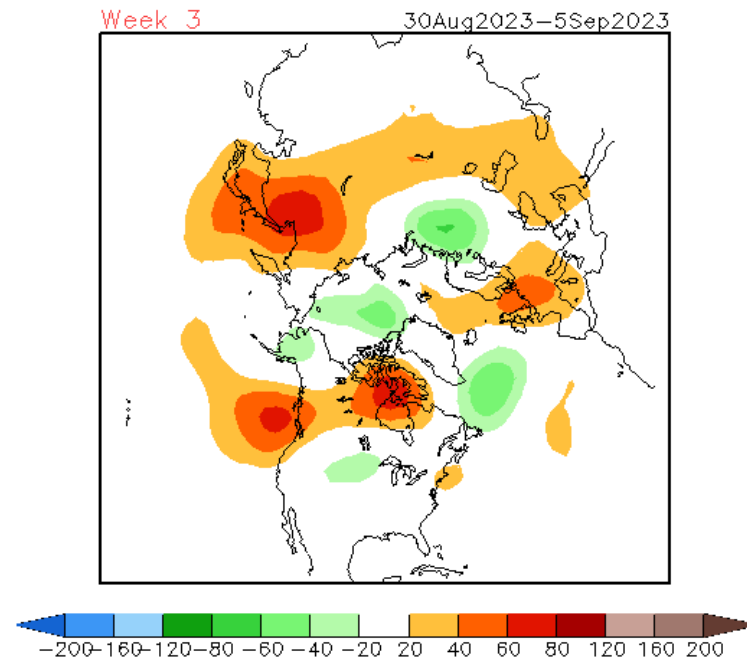
Official NOAA CPC ENSO Probabilities (issued Aug. 2023)



Should we plan for El Niño?



CFSv2 Weeks 3 & 4 500 hPa Z Anomalies (m)
16 Member Ensemble Mean Forecast from 15Aug2023



3-4 Week Forecasts
from NOAA/CPC's
CFS Model Suggests
Warm and Dry Weather
into September 2023

Climate models projecting a warm, but not extreme, season ahead

C3S multi-system seasonal forecast

ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC

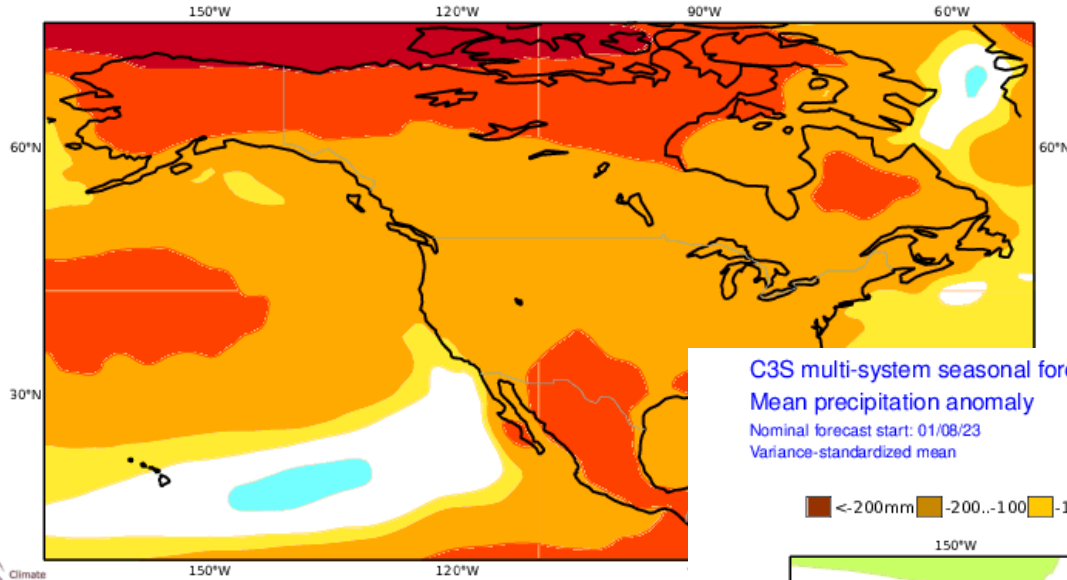
Mean 2m temperature anomaly

SON 2023

Nominal forecast start: 01/08/23

Variance-standardized mean

■ <-2.0°C ■ -2.0..-1.0 ■ -1.0..-0.5 ■ -0.5..-0.2 ■ -0.2..0.2 ■ 0.2..0.5 ■ 0.5..1.0 ■ 1.0..2.0 ■ > 2.0°C



C3S multi-system seasonal forecast

ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC

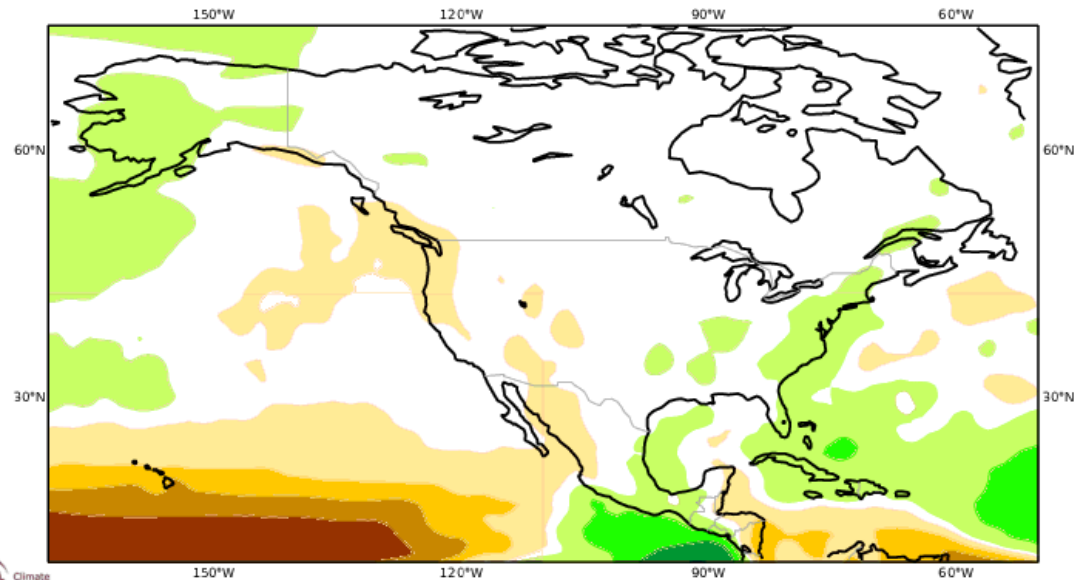
Mean precipitation anomaly

SON 2023

Nominal forecast start: 01/08/23

Variance-standardized mean

■ <-200mm ■ -200..-100 ■ -100..-50 ■ -50..-10 ■ -10..10 ■ 10..50 ■ 50..100 ■ 100..200 ■ > 200mm



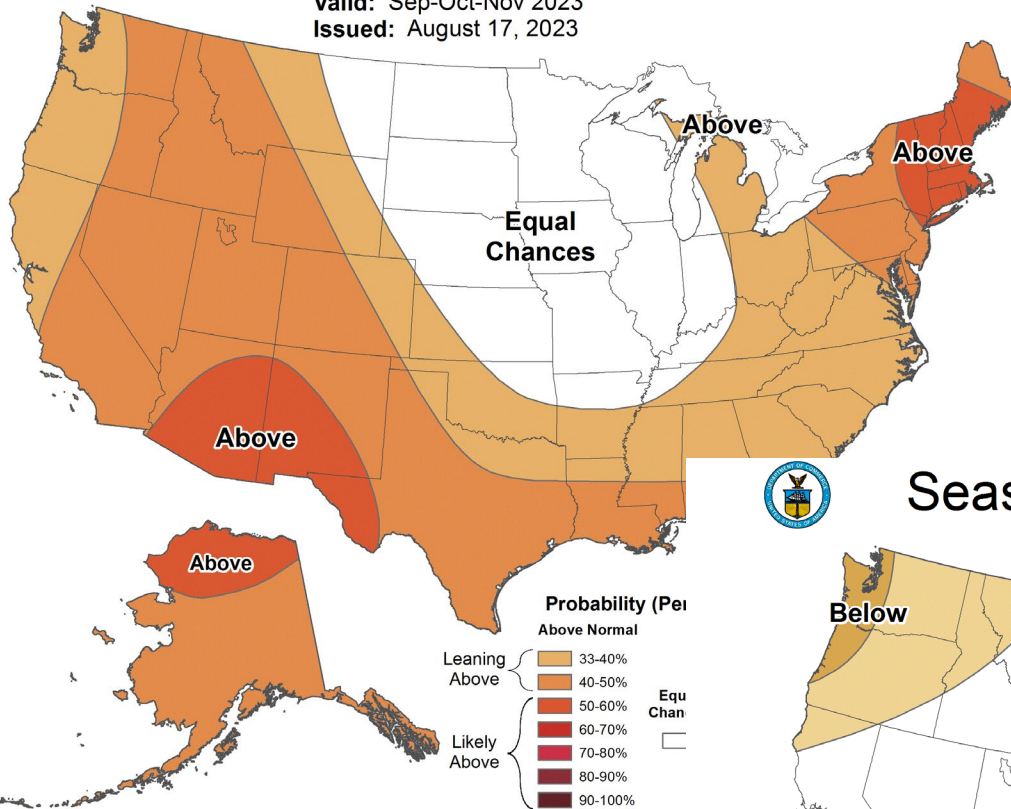


Seasonal Temperature Outlook



Valid: Sep-Oct-Nov 2023

Issued: August 17, 2023



NOAA/CPC Forecasts for Sep-Nov 2023

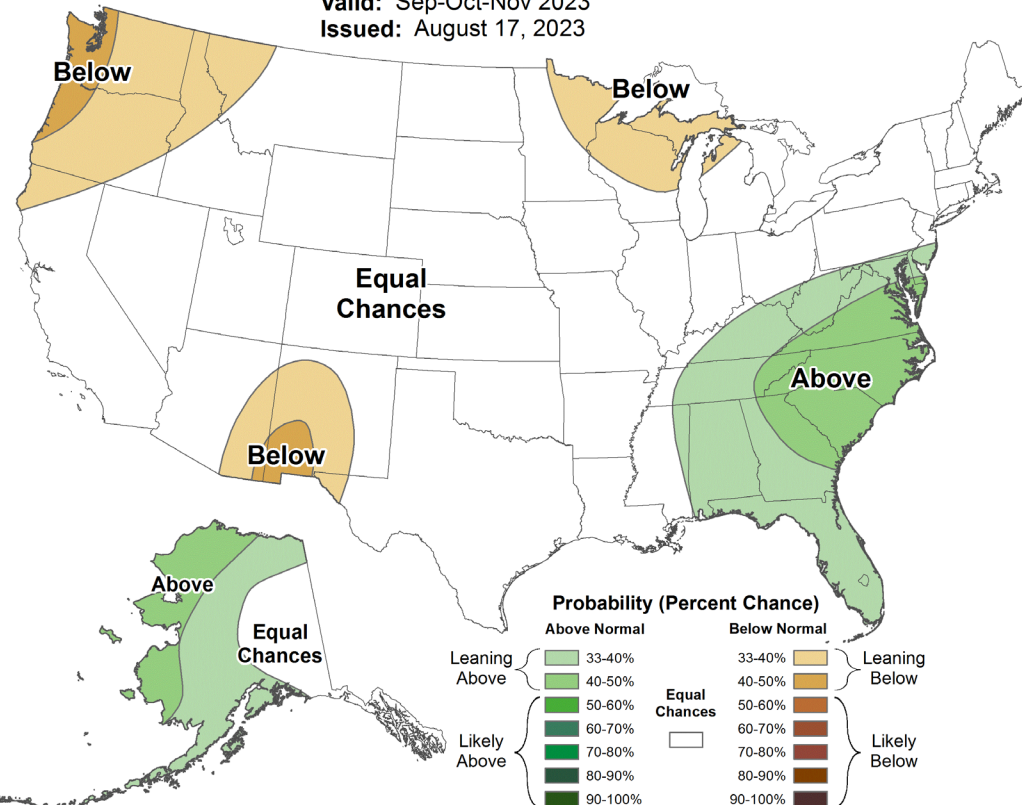


Seasonal Precipitation Outlook



Valid: Sep-Oct-Nov 2023

Issued: August 17, 2023





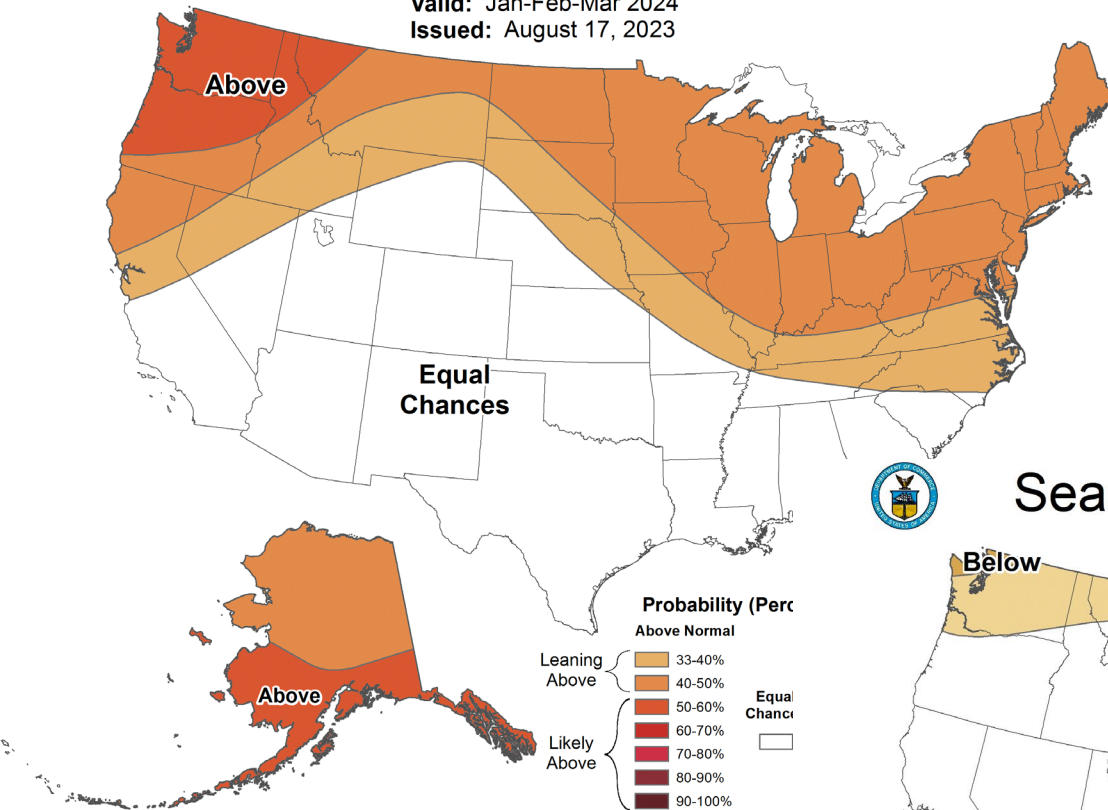
Seasonal Temperature Outlook

Valid: Jan-Feb-Mar 2024

Issued: August 17, 2023



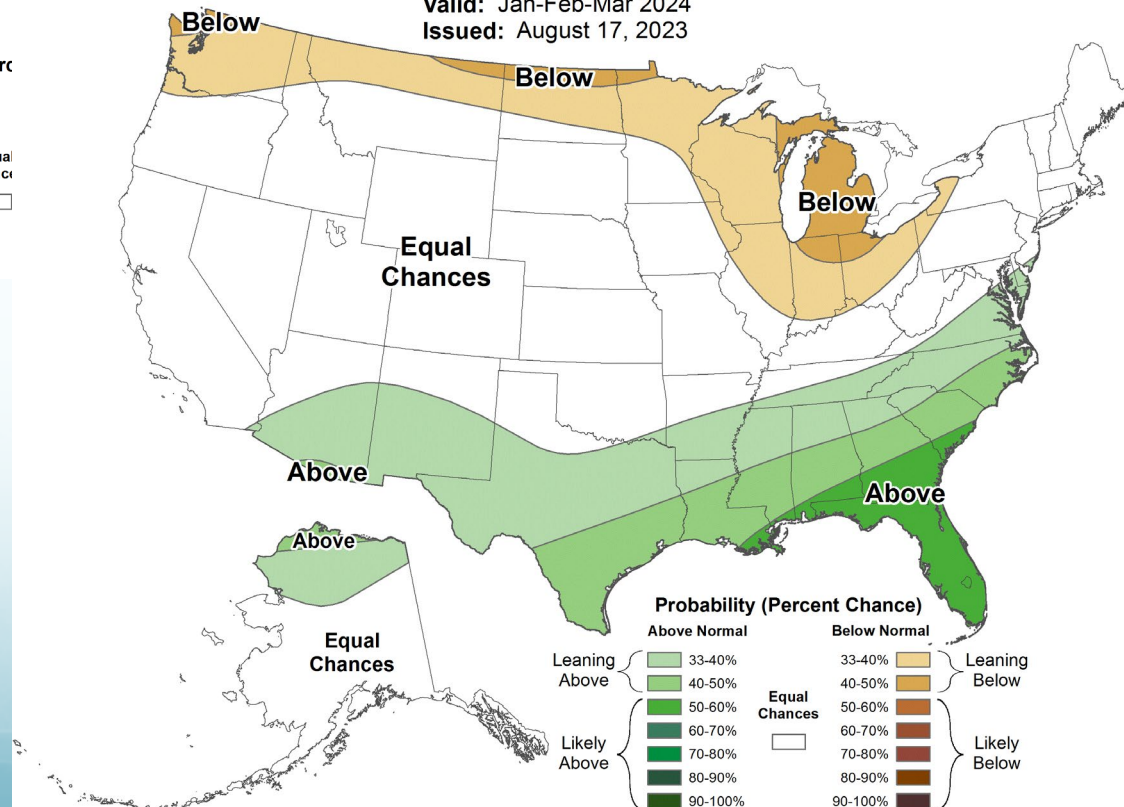
NOAA/CPC
Forecasts for
Jan-Mar 2024



Seasonal Precipitation Outlook

Valid: Jan-Feb-Mar 2024

Issued: August 17, 2023



Summary

- For the water year, average temperatures have been near-normal and precipitation below normal (~80% of normal)
- May-July ranked as the 4th warmest and 6th driest averaged for WA
- August has been warmer than normal so far but with some precipitation in eastern WA
- The remainder of summer into fall is apt be warm and dry, relative to seasonal norms
- El Niño means a good chance for a warmer than normal winter, but precipitation amounts are more uncertain



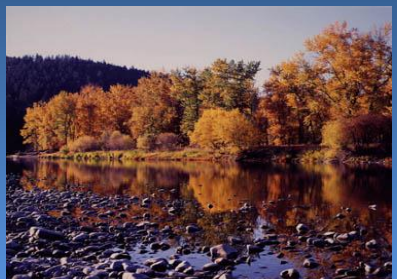
Northwest River Forecast Center



Aug 18, 2023 Washington Water Supply Availability Meeting



Amy Burke
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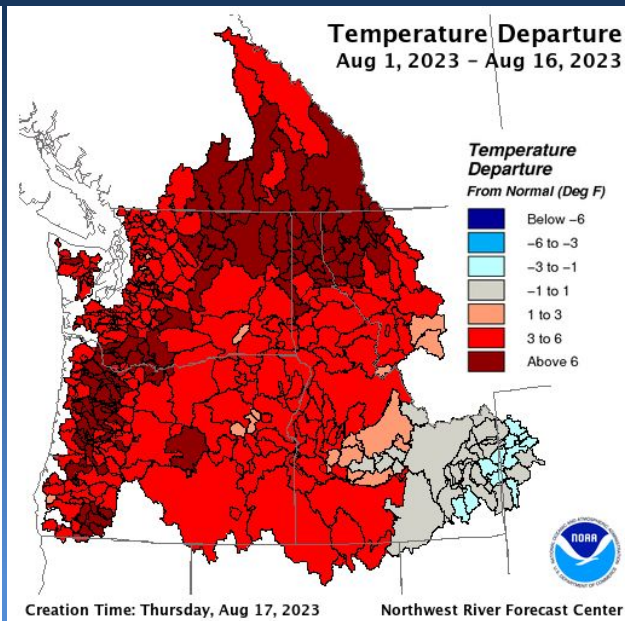
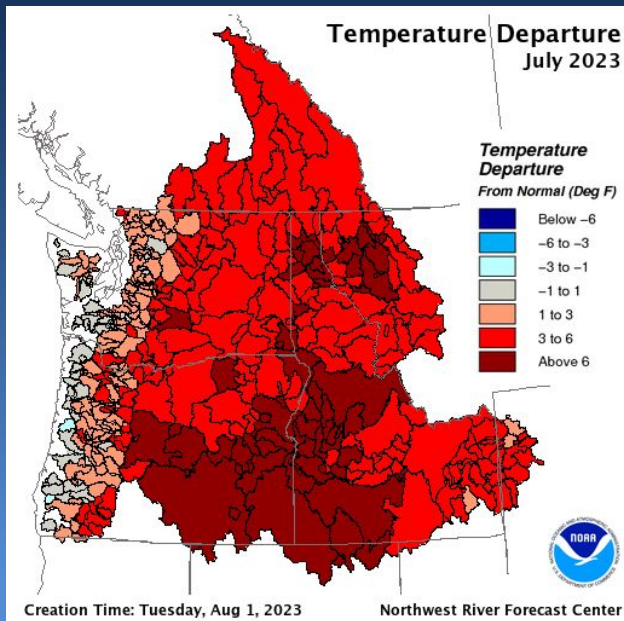
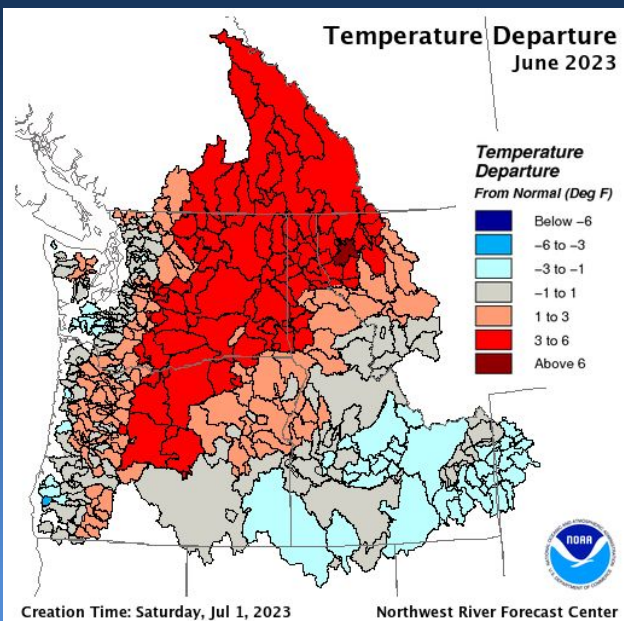
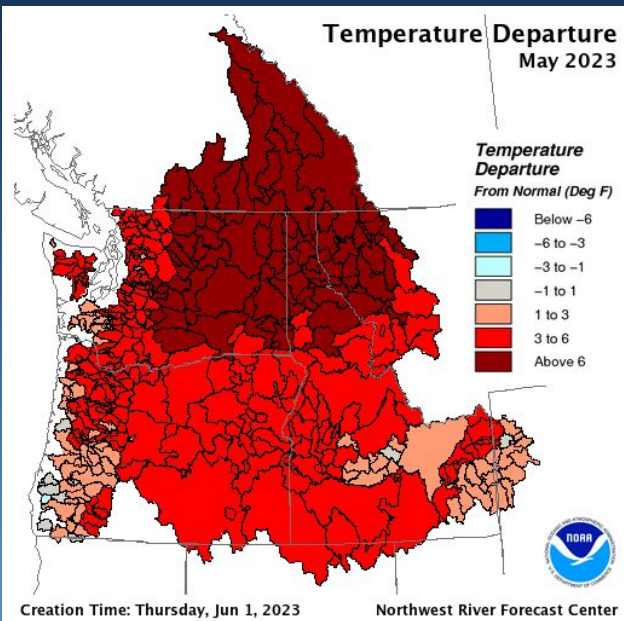
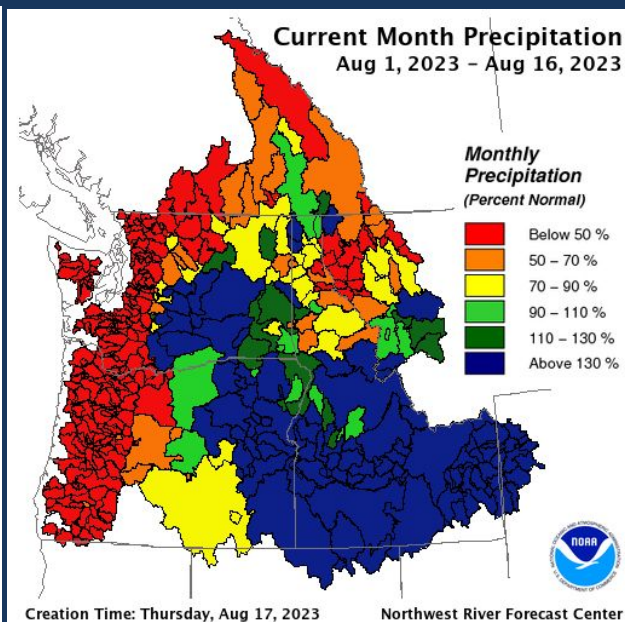
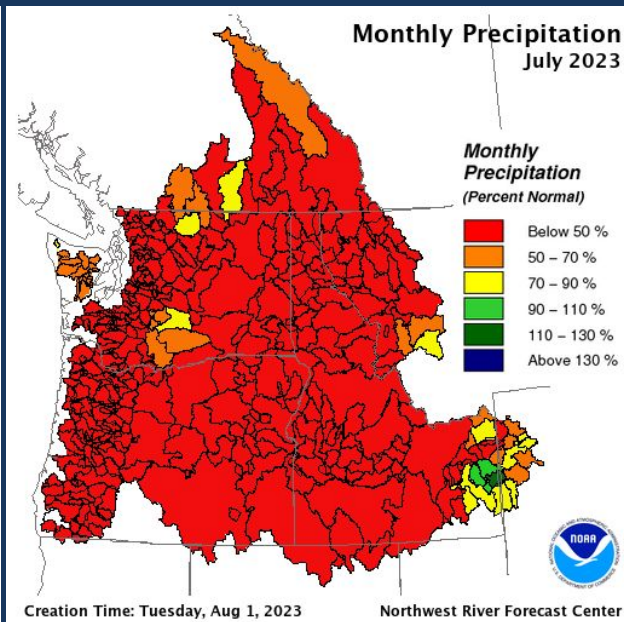
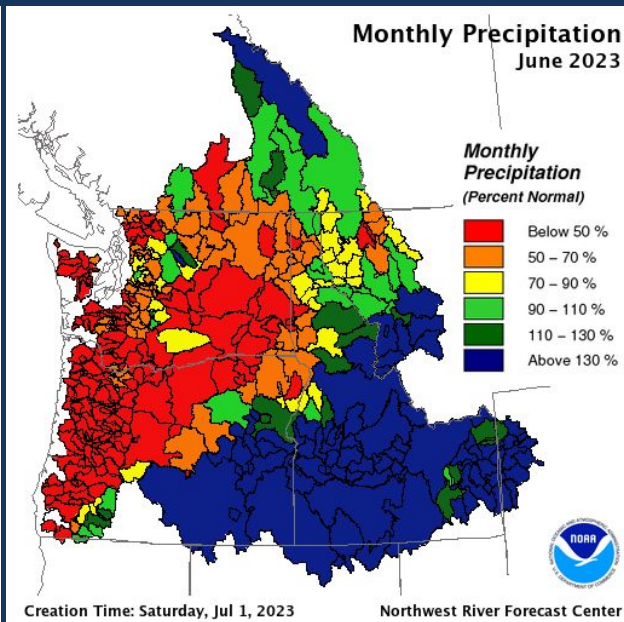
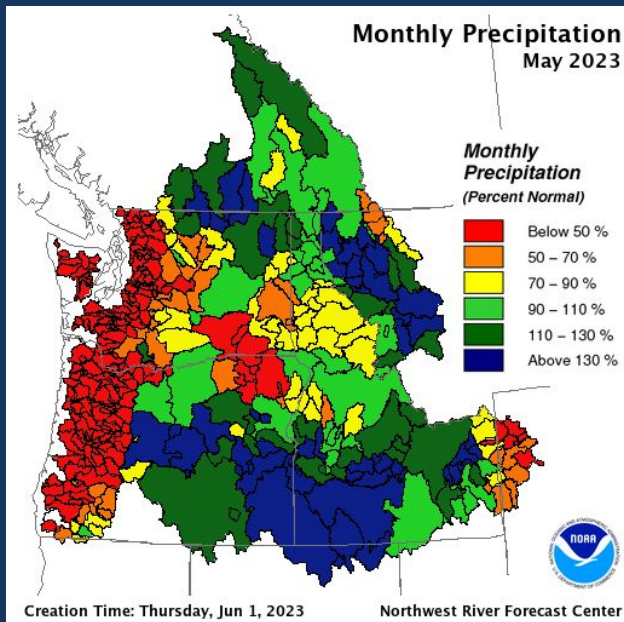


Take Home Messages

- There was rapid snowmelt this May.
- The summer has been drier and hotter than normal.
- Adjusted water year runoff remains largely below normal.
- ESP10 Natural Water Supply forecasts are a mix of normal and below normal. Some forecasts have dropped recently.

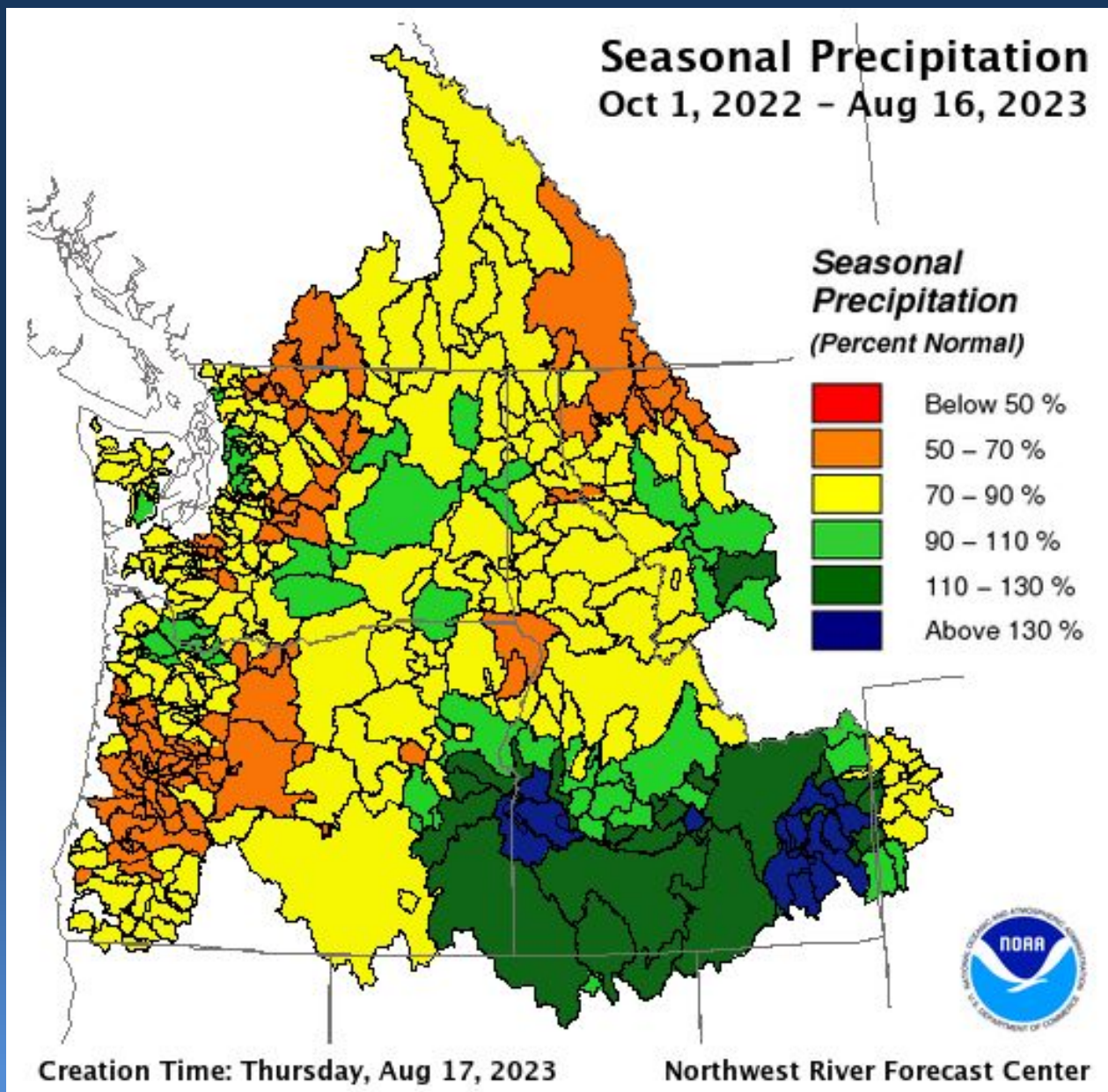


Precipitation and Temperature





Precipitation and Temperature





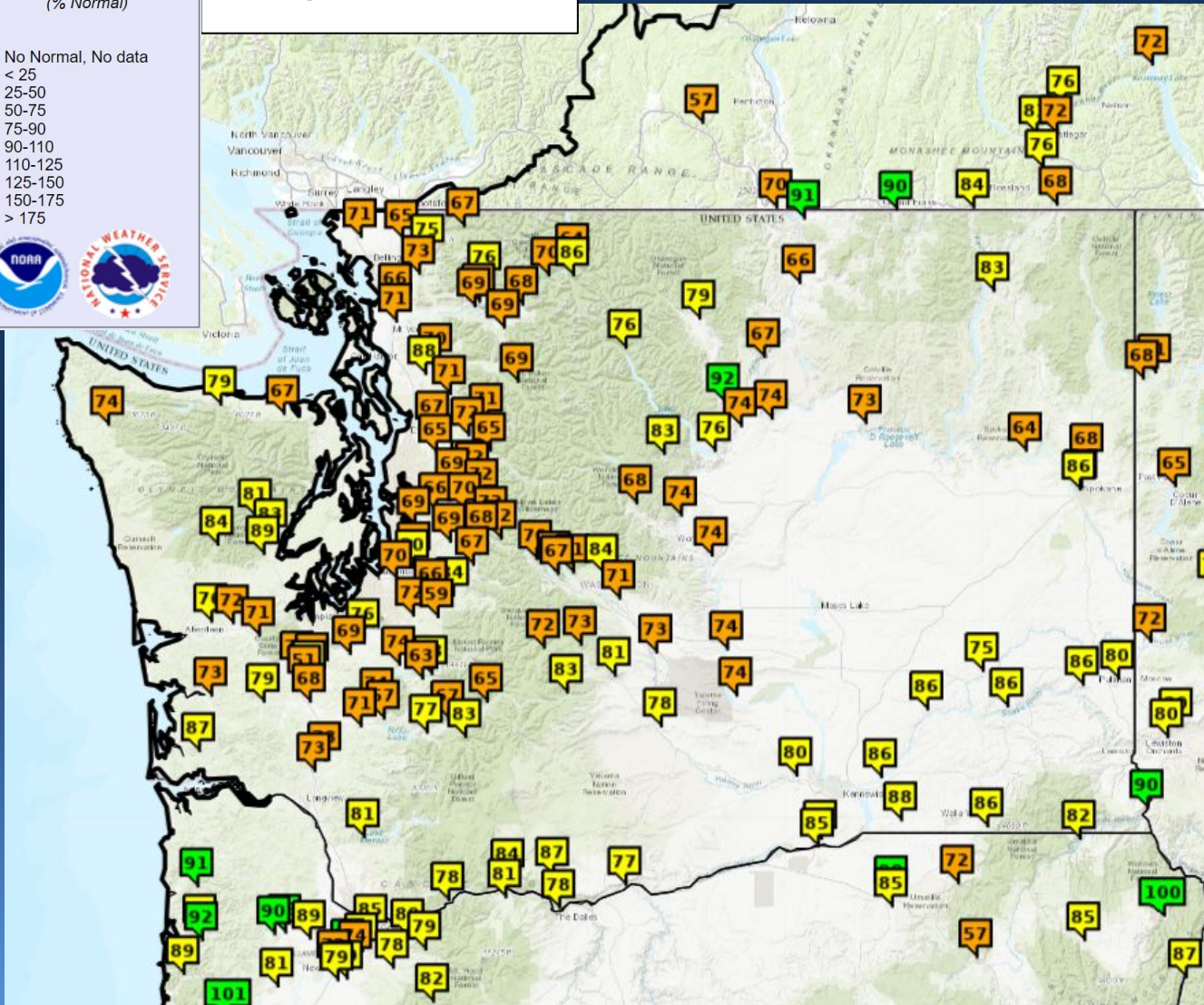
YTD Adjusted Natural Runoff

Natural Runoff

Period: Oct thru Curr
(% Normal)

Aug 17, 2023

○ No Normal, No data
● < 25
● 25-50
● 50-75
● 75-90
● 90-110
● 110-125
● 125-150
● 150-175
● > 175



% Normal Runoff Oct 1 – Aug 17

Washington

Skagit nr Mt Vernon 71

Dungeness nr Sequim 67

Chehalis at Porter 71

Okanogan at Malott 67

Methow nr Pateros 92

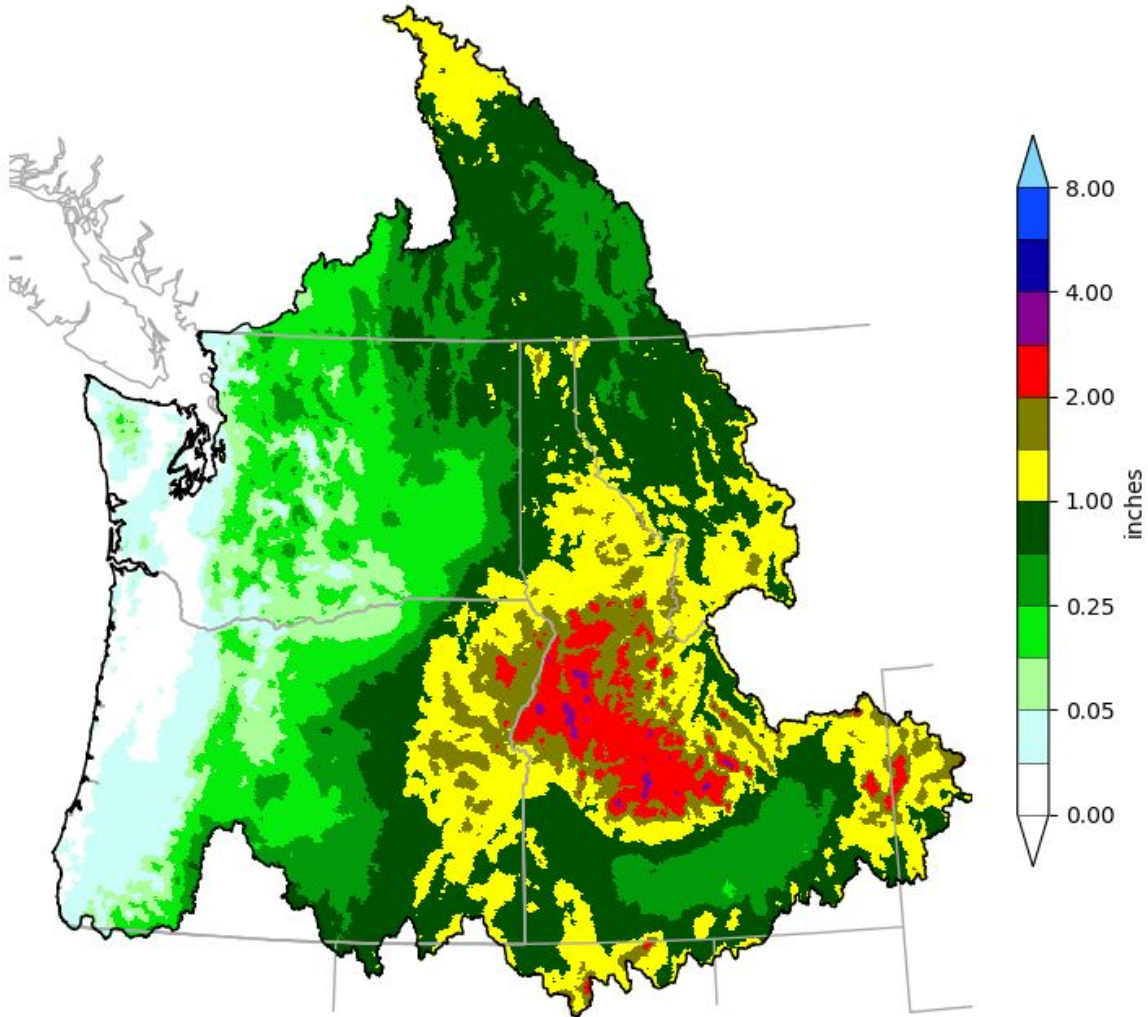
Yakima at Parker 78

Walla Walla nr Touchet 88

10 Day Precipitation Forecast



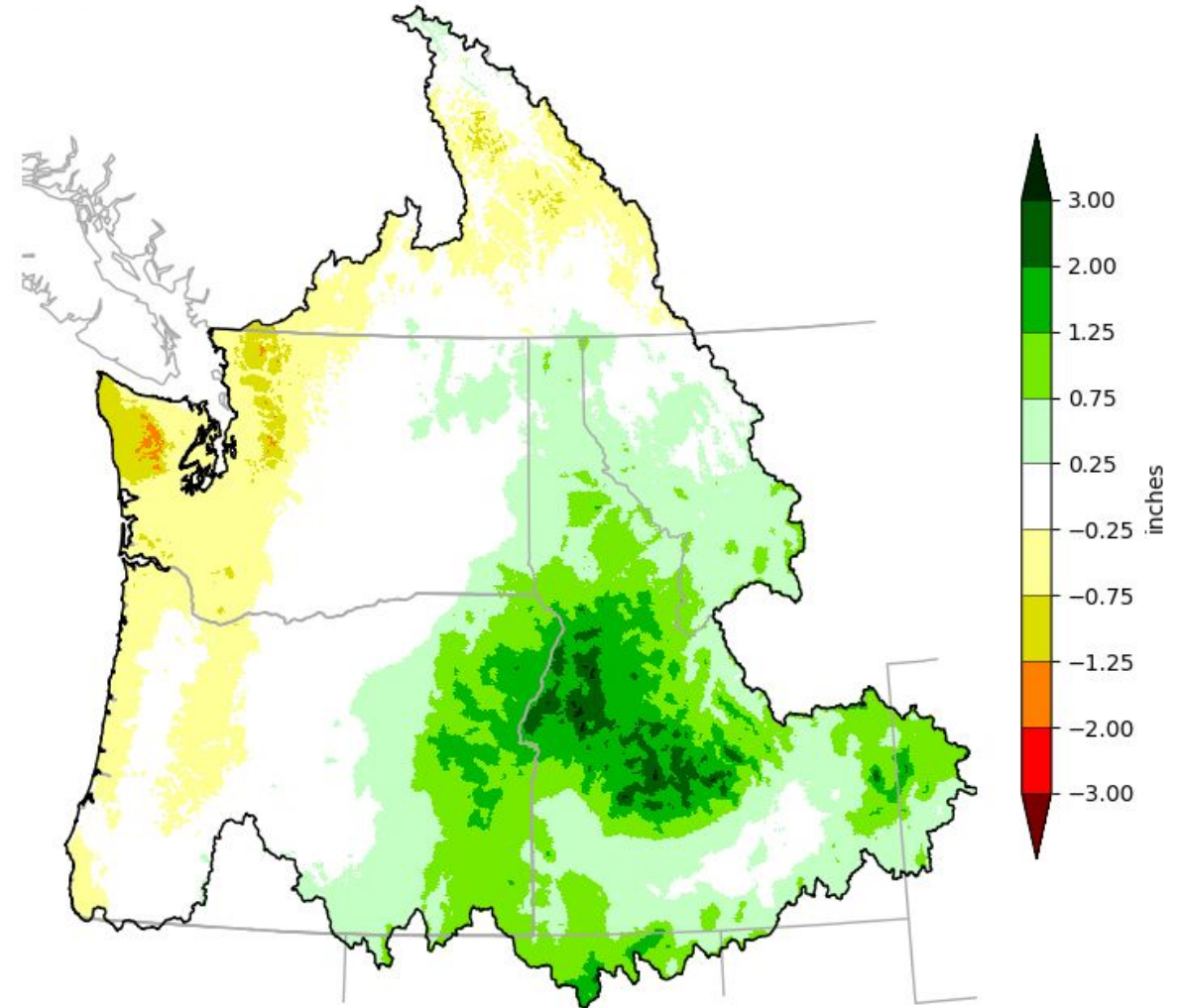
Northwest River Forecast Center
10 Day QPF, Ending 12Z, 08/27/23



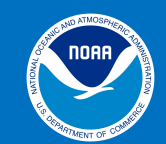
Creation Time: Thu Aug 17 20:45:31 UTC 2023



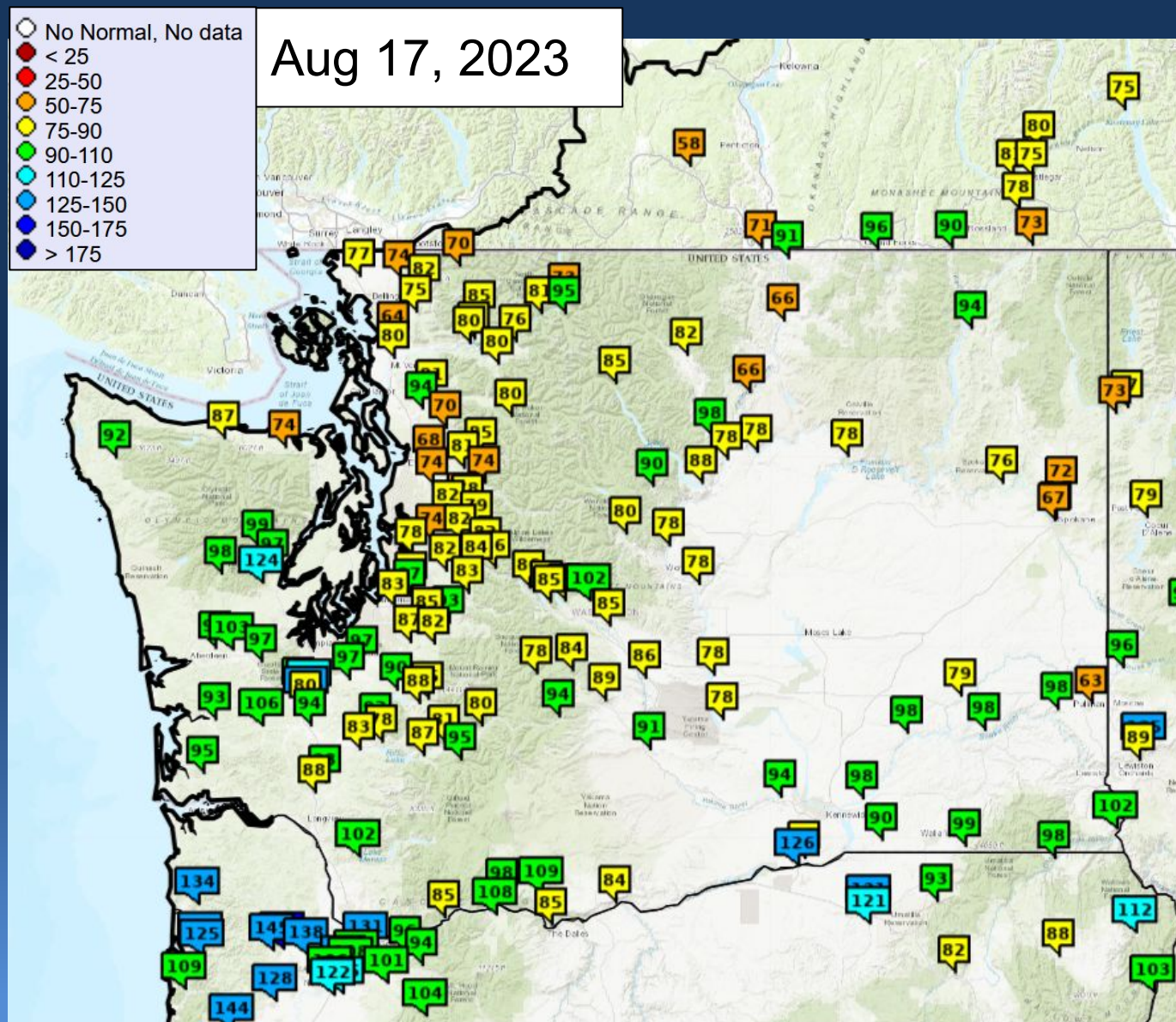
Northwest River Forecast Center
10 Day QPF (Deviation from Climatology), Ending 12Z, 08/27/23



Creation Time: Thu Aug 17 20:45:56 UTC 2023



ESP10 Natural Water Supply Forecasts

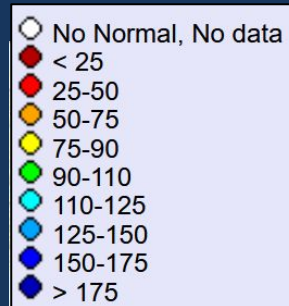


% Normal Apr -Sep Volume

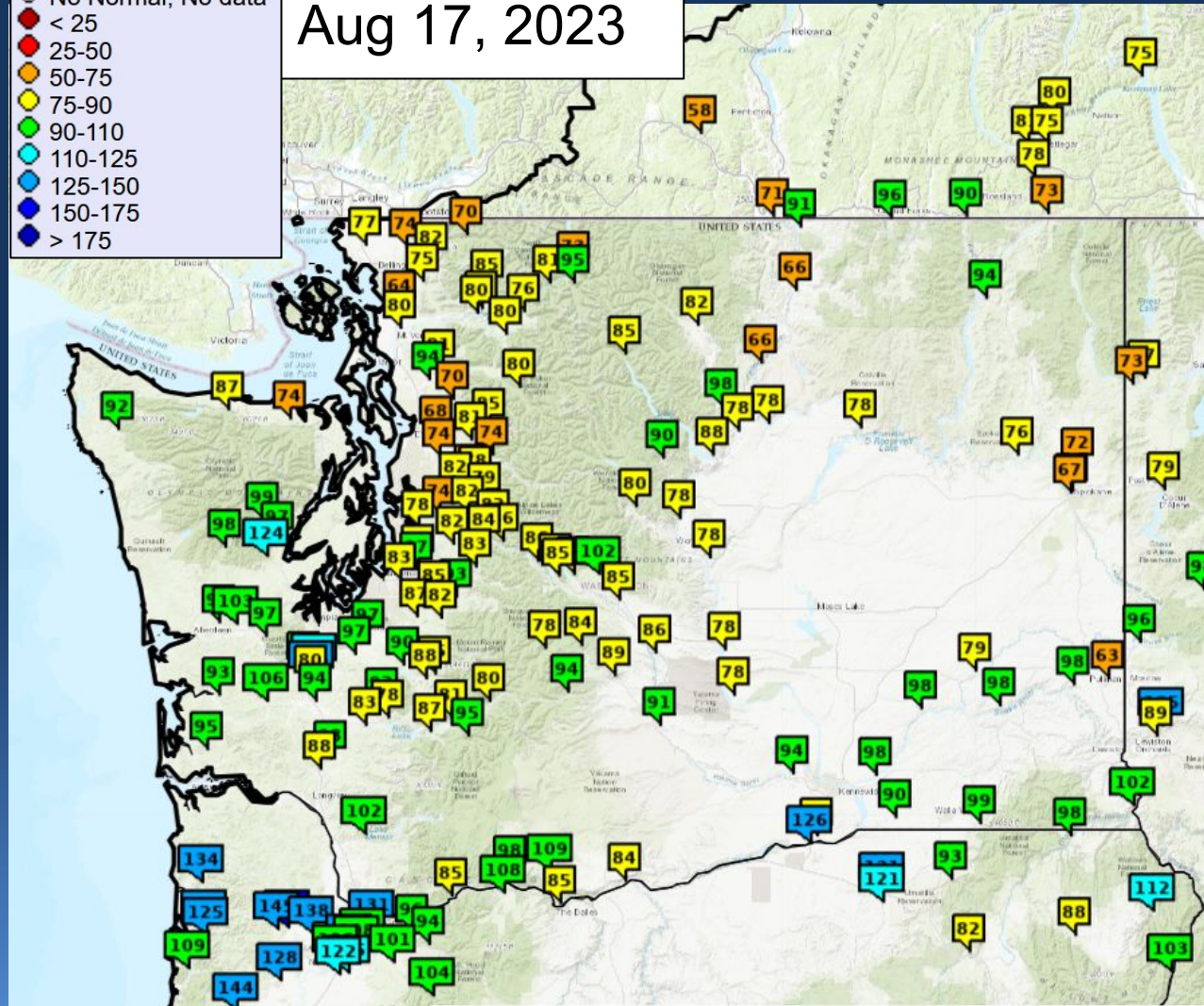
Washington

| | |
|------------------------|----|
| Skagit nr Mt Vernon | 80 |
| Dungeness nr Sequim | 74 |
| Chehalis at Porter | 97 |
| Okanogan at Malott | 66 |
| Methow nr Pateros | 98 |
| Yakima at Parker | 91 |
| Walla Walla nr Touchet | 90 |

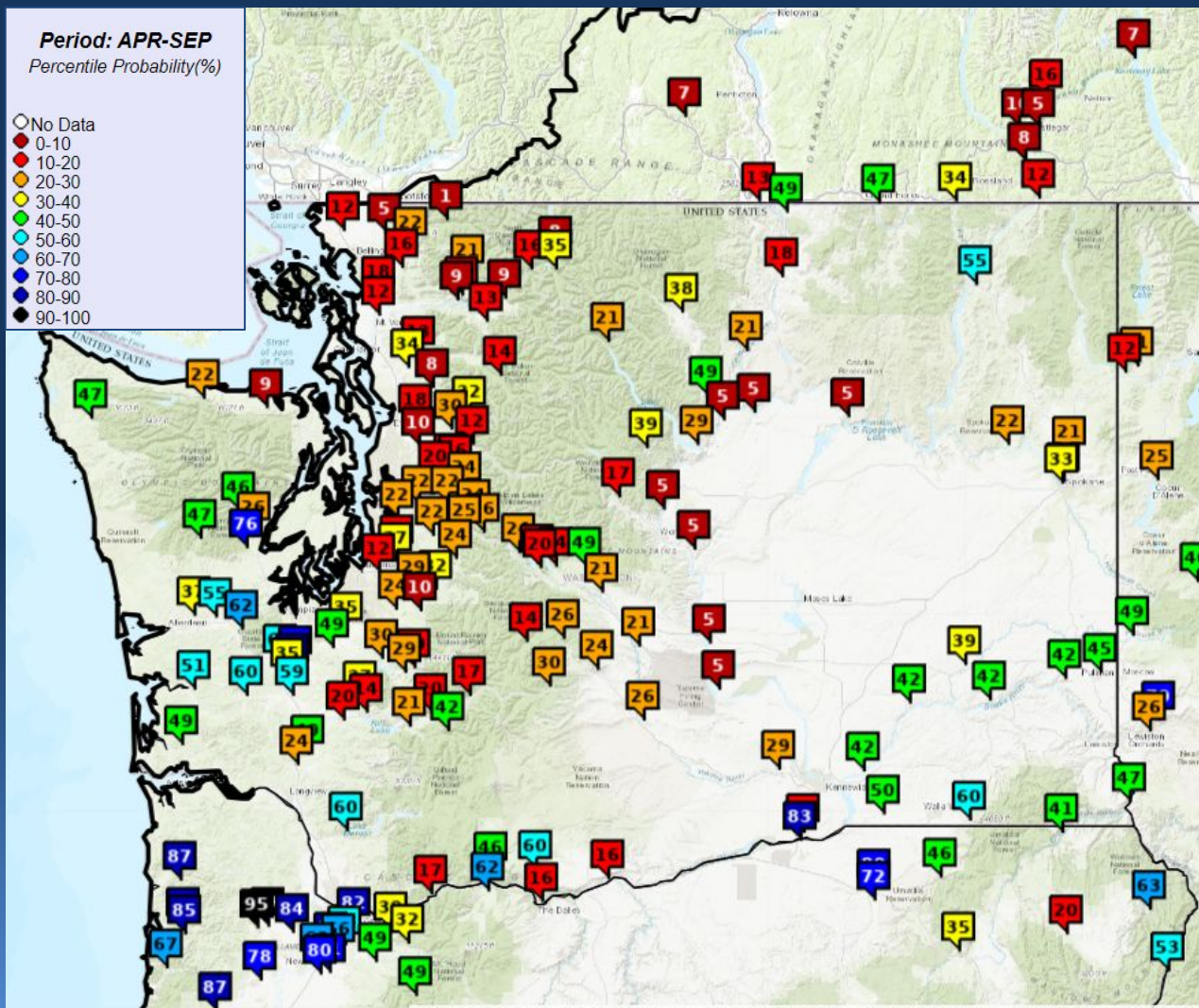
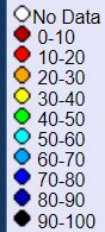
ESP10 Natural Water Supply Forecasts



Aug 17, 2023

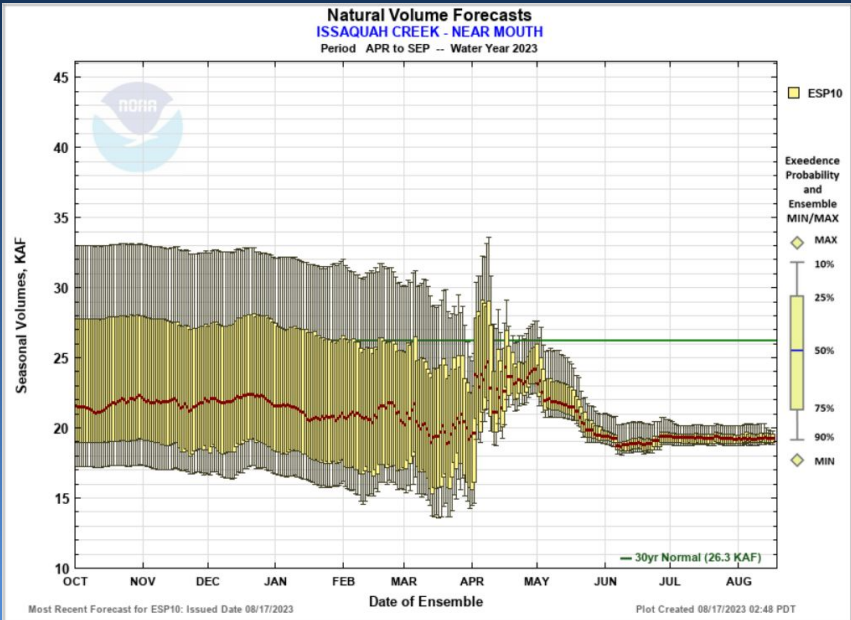
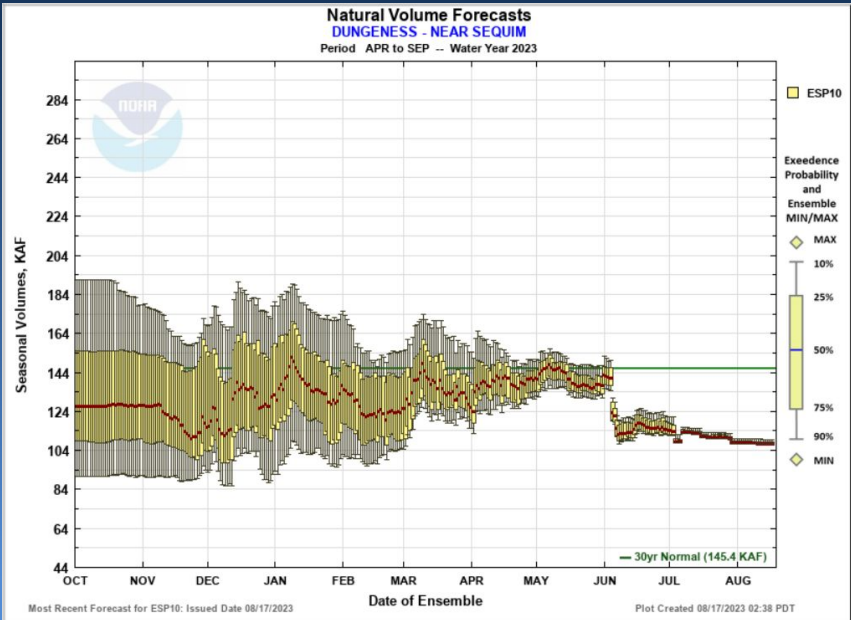
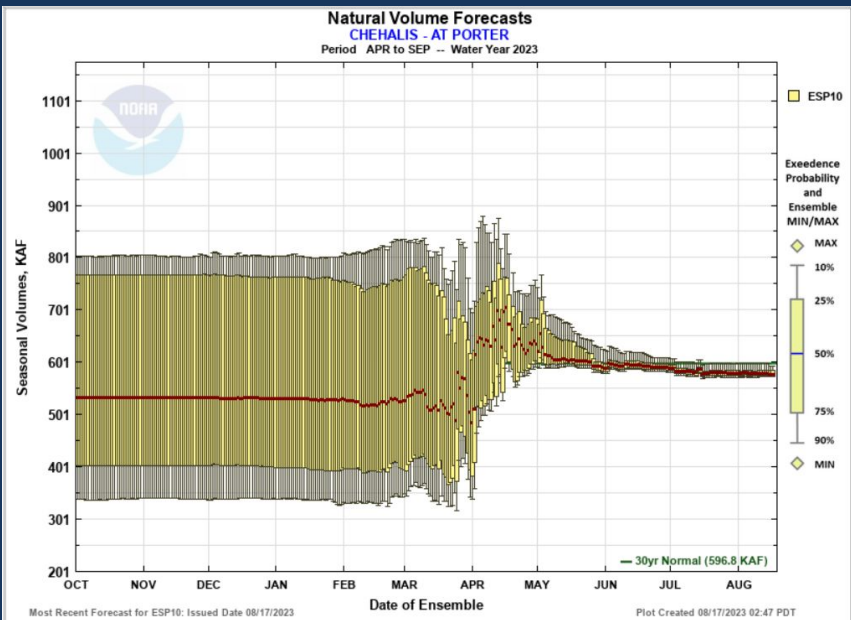
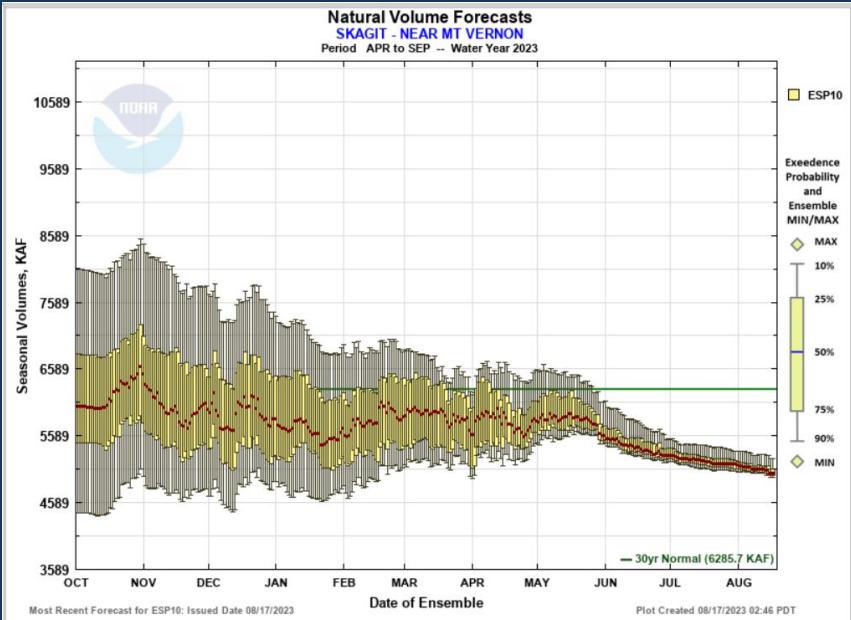


Period: APR-SEP
Percentile Probability(%)





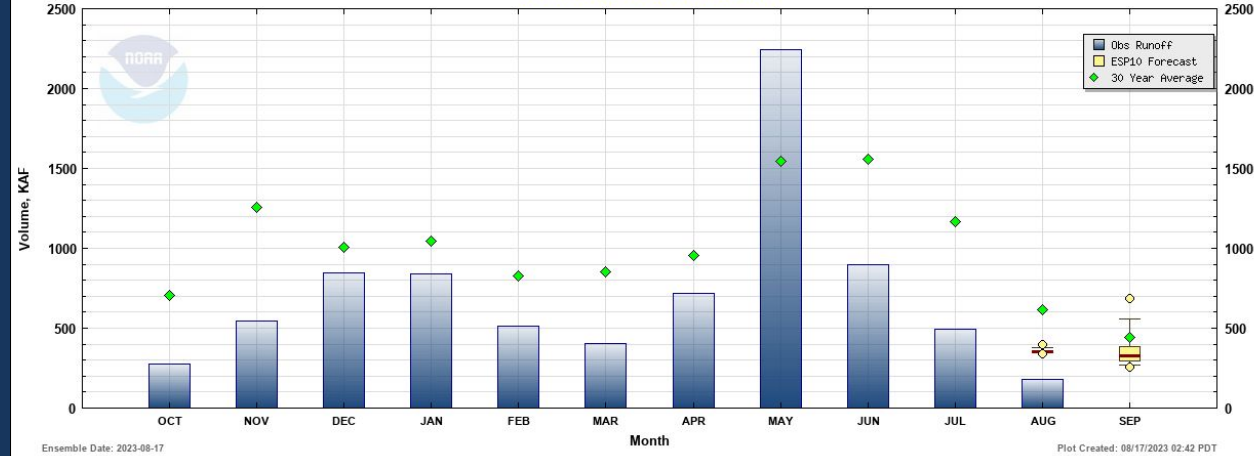
ESP10 Natural Water Supply Forecasts



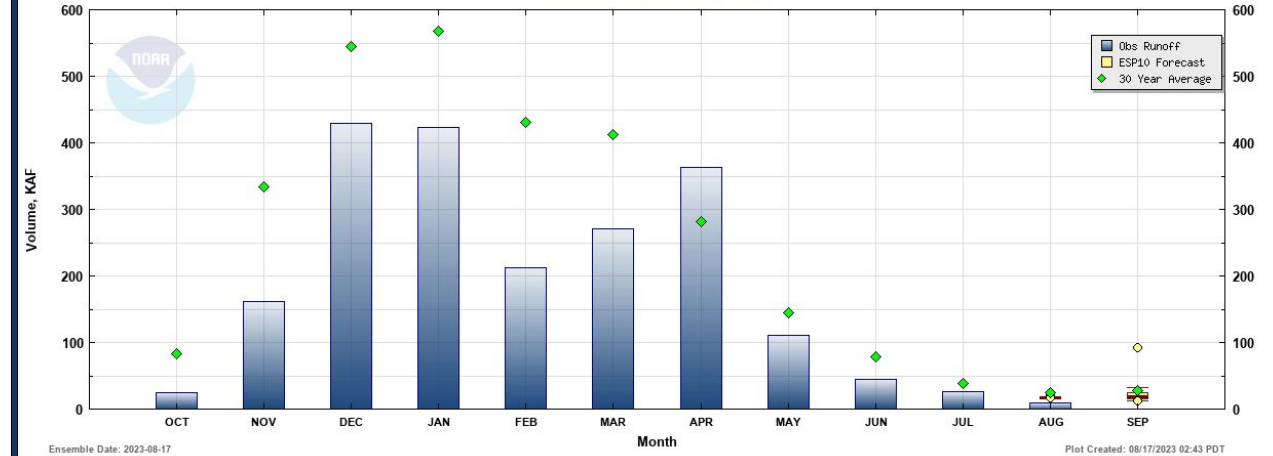


ESP10 Natural Water Supply Forecasts

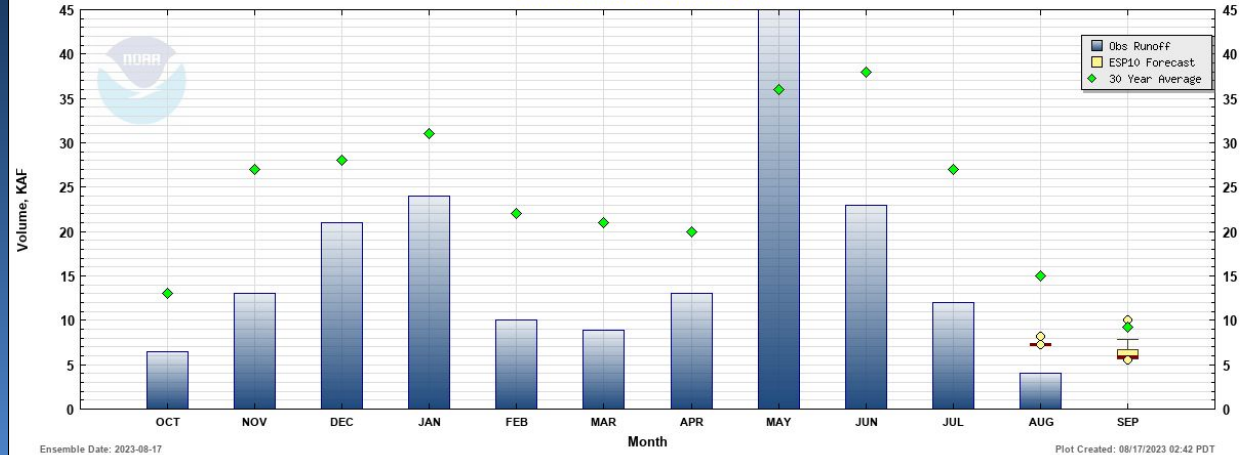
Natural Volume Monthly Forecasts (ESP10) for Water Year 2023
(MVEW1) SKAGIT - NEAR MT VERNON



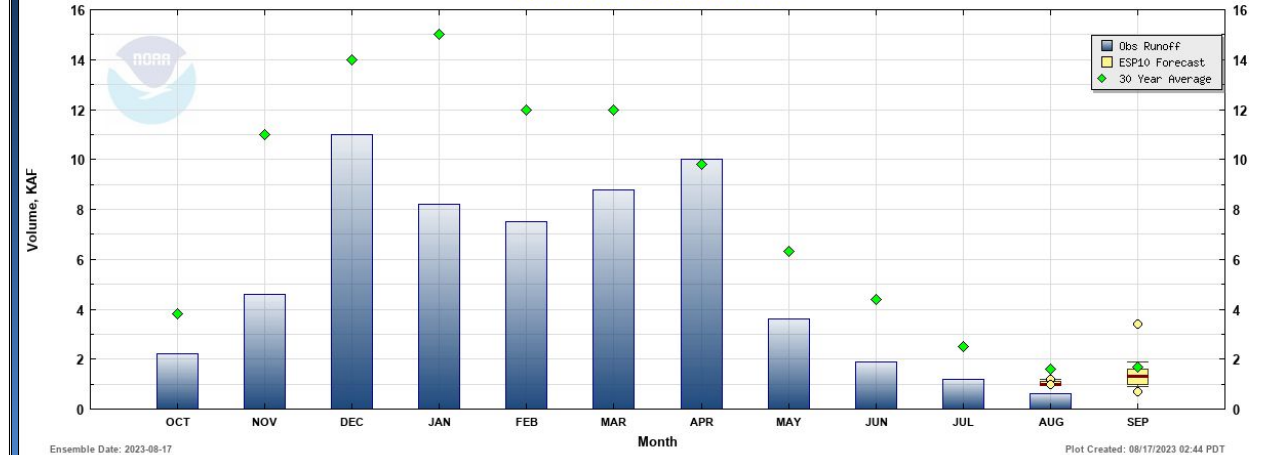
Natural Volume Monthly Forecasts (ESP10) for Water Year 2023
(CRPW1) CHEHALIS - AT PORTER



Natural Volume Monthly Forecasts (ESP10) for Water Year 2023
(DRSW1) DUNGENESS - NEAR SEQUIM

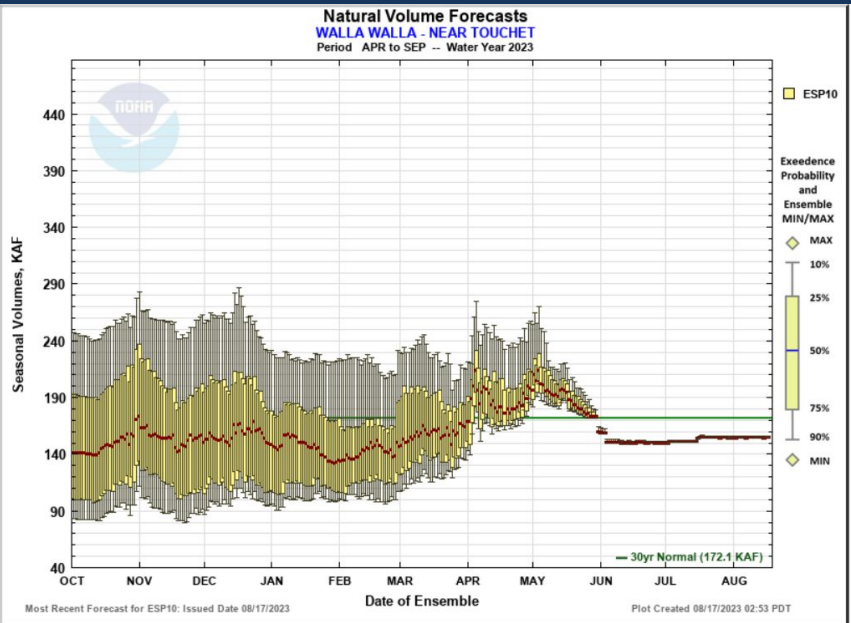
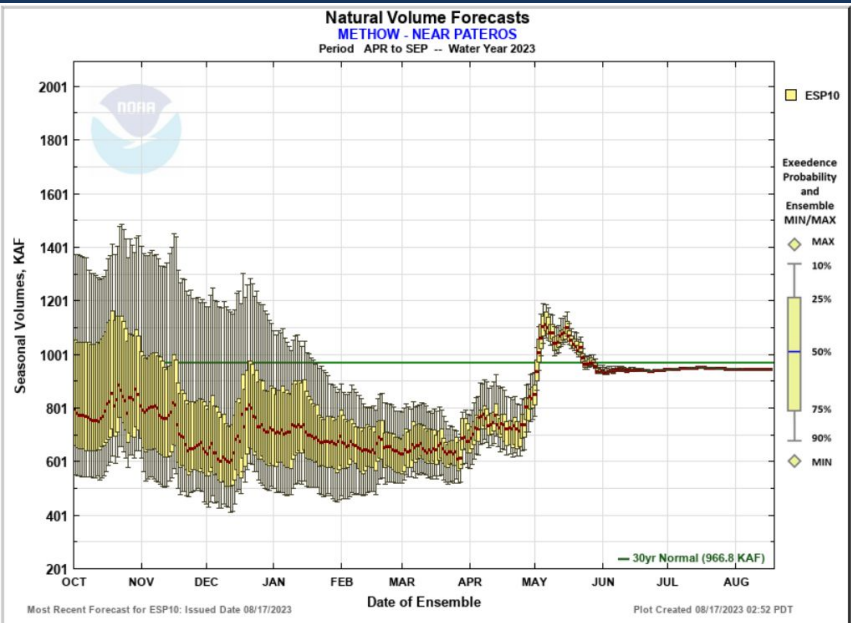
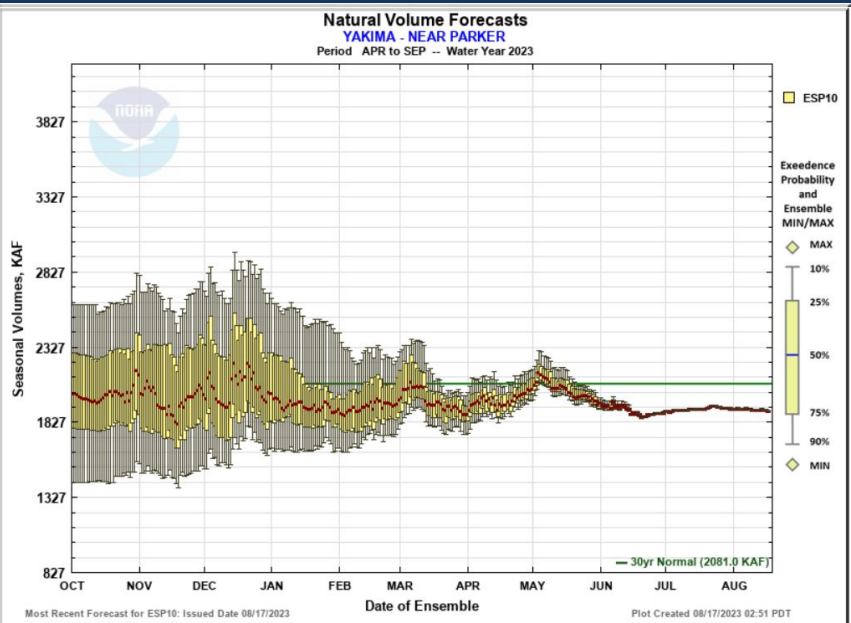
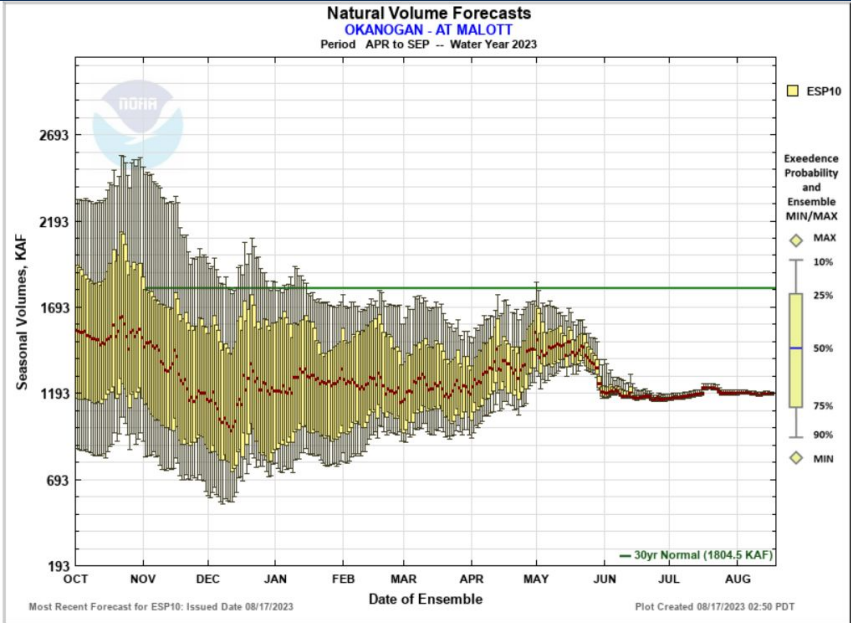


Natural Volume Monthly Forecasts (ESP10) for Water Year 2023
(ISSW1) ISSAQUAH CREEK - NEAR MOUTH





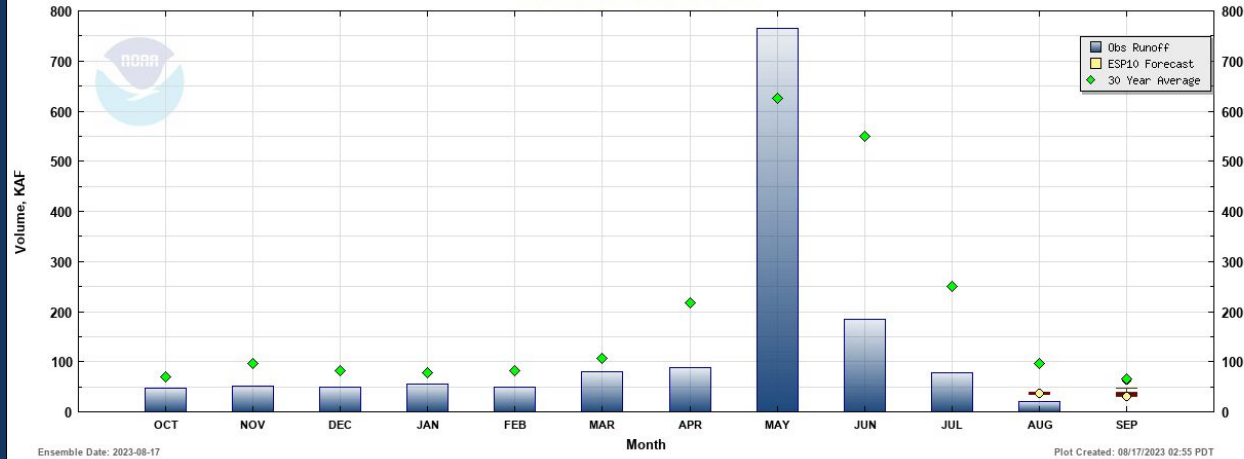
ESP10 Natural Water Supply Forecasts



ESP10 Natural Water Supply Forecasts

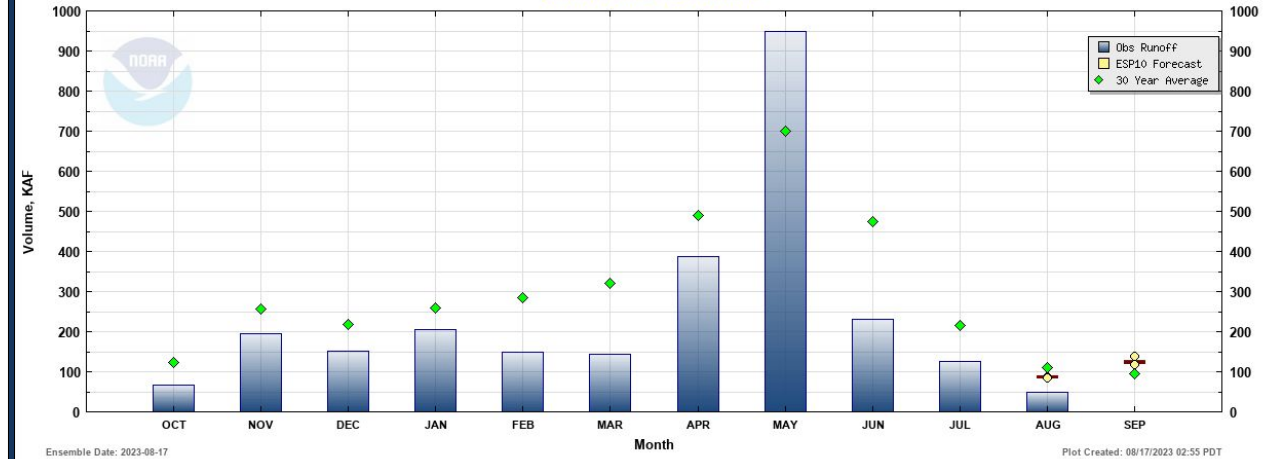
Natural Volume Monthly Forecasts (ESP10) for Water Year 2023

(OKMW1) OKANOGAN - AT MALOTT



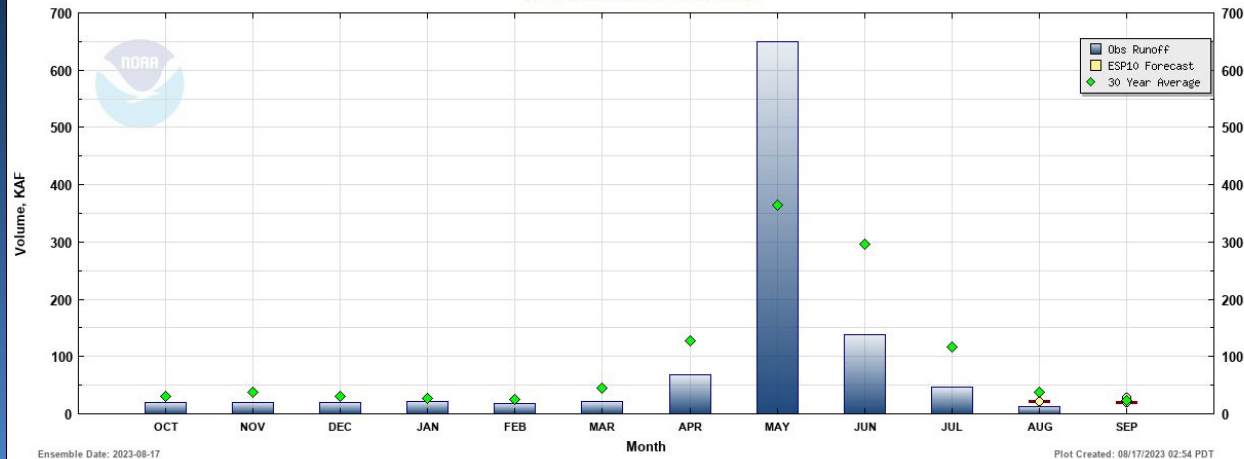
Natural Volume Monthly Forecasts (ESP10) for Water Year 2023

(PARW1) YAKIMA - NEAR PARKER



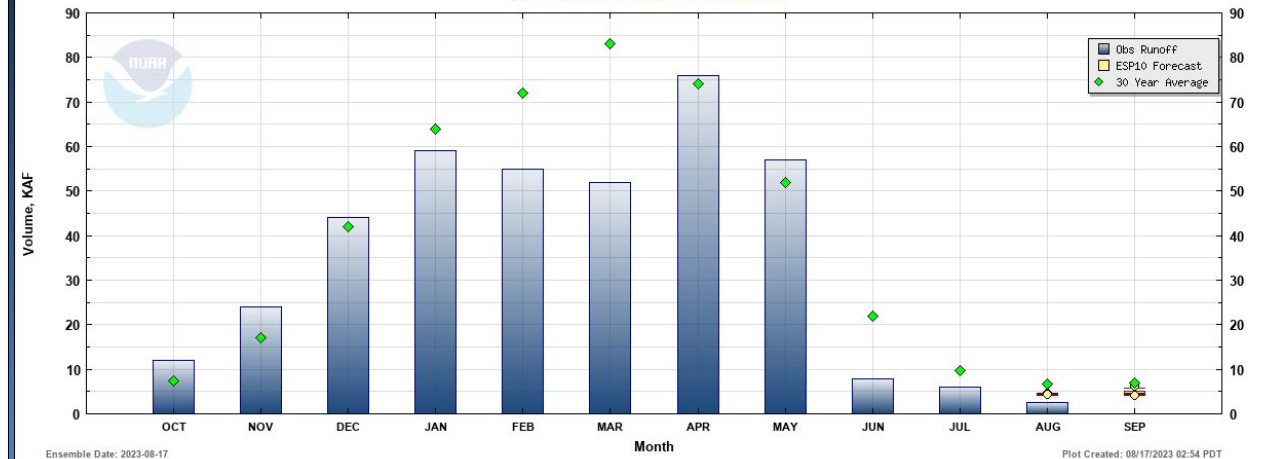
Natural Volume Monthly Forecasts (ESP10) for Water Year 2023

(PATW1) METHOW - NEAR PATEROS



Natural Volume Monthly Forecasts (ESP10) for Water Year 2023

(TCHW1) WALLA WALLA - NEAR TOUCHET





Take Home Messages

- There was rapid snowmelt this May.
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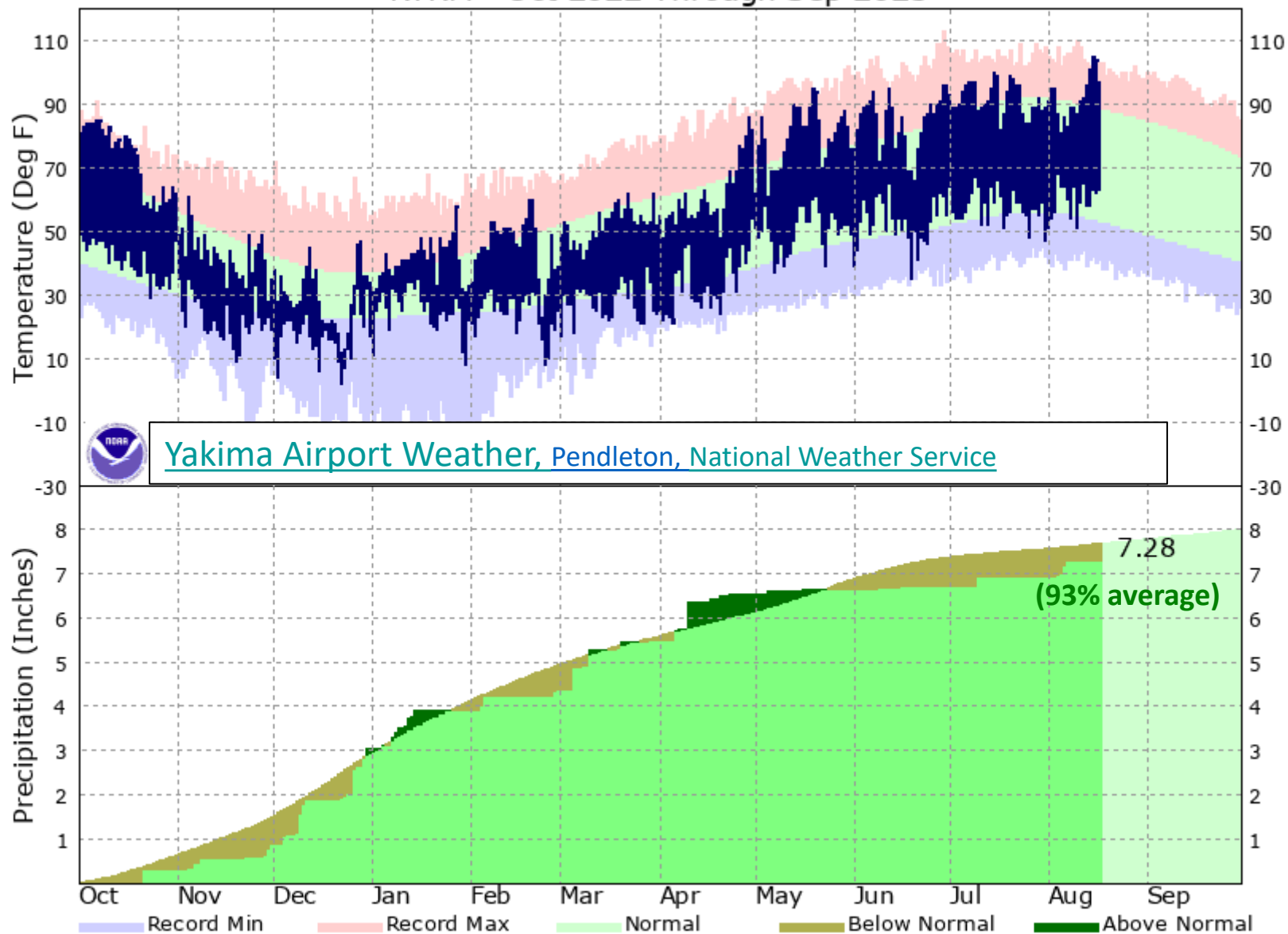
— BUREAU OF —
RECLAMATION

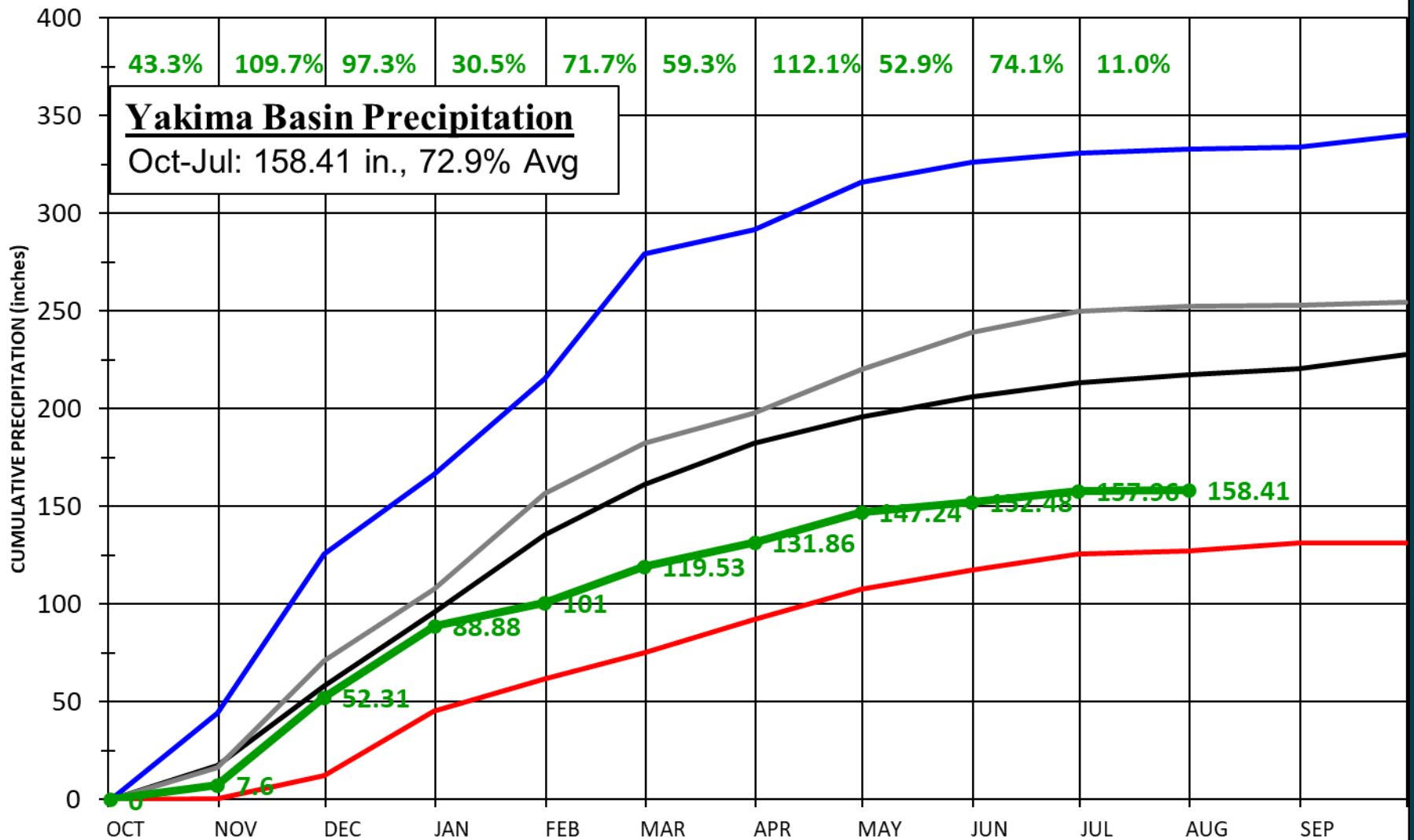
Yakima River Operations & Water Supply Meeting



Meeting starts at 10:30 AM

KYKM - Oct 2022 Through Sep 2023

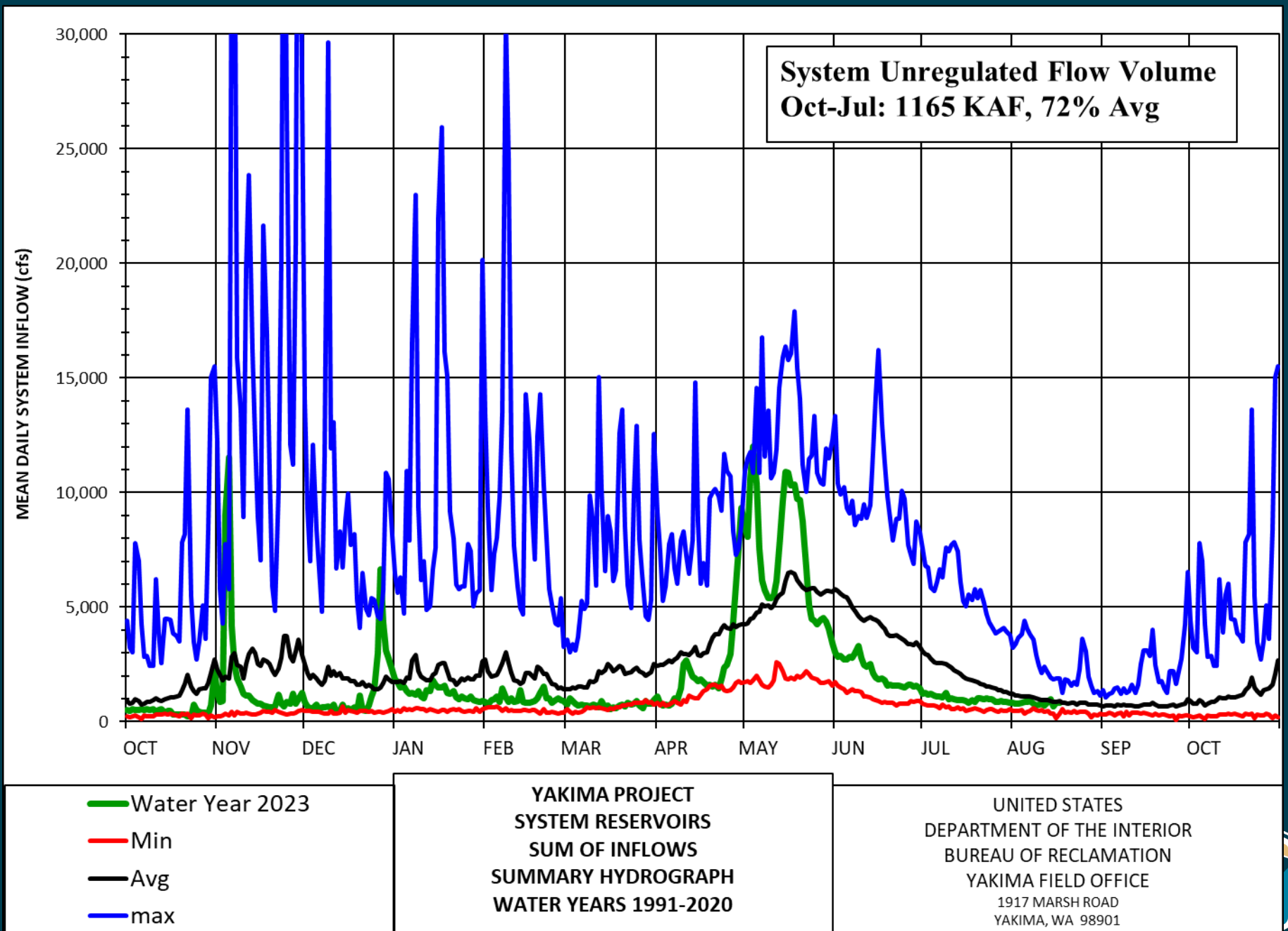


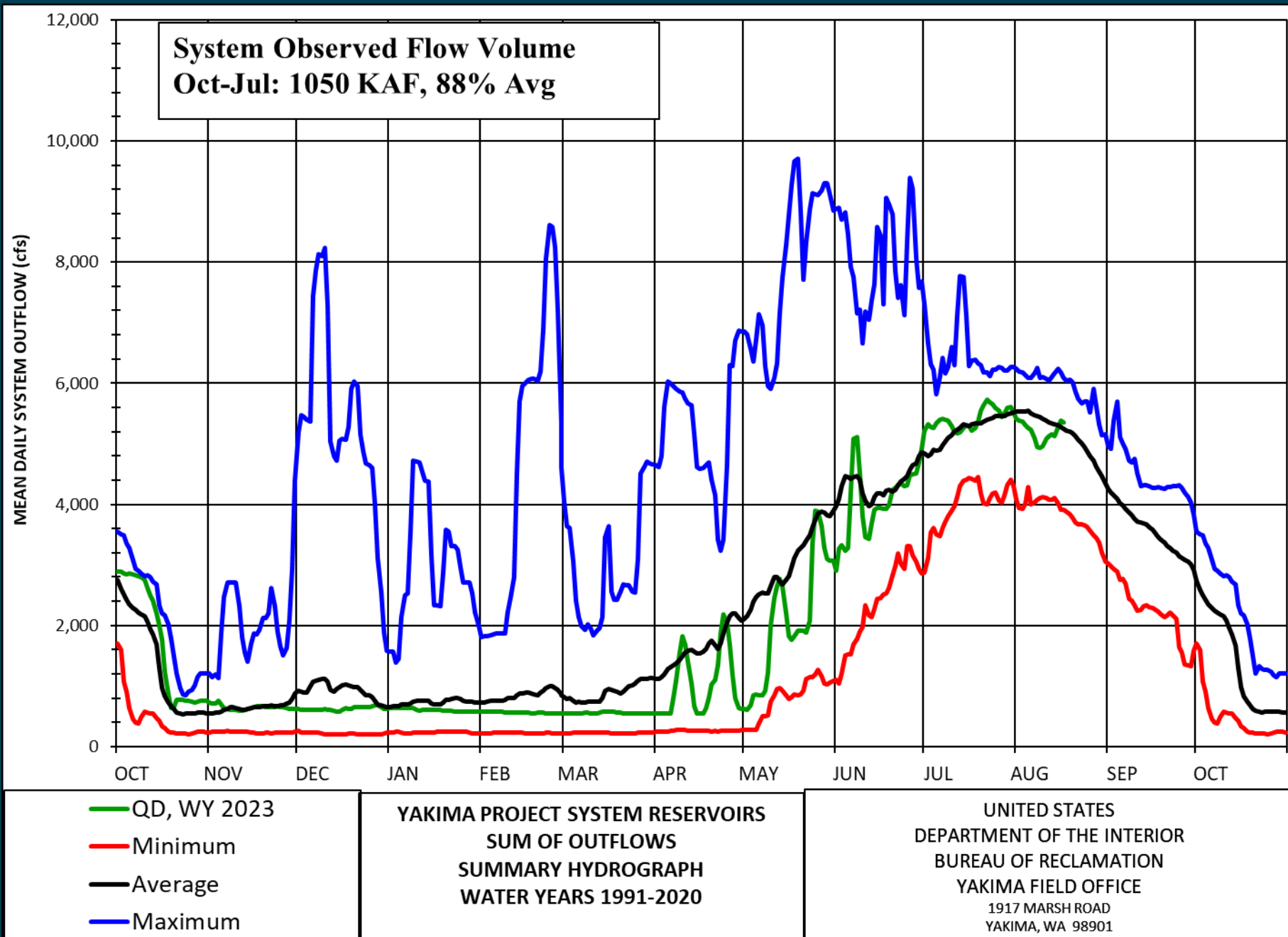


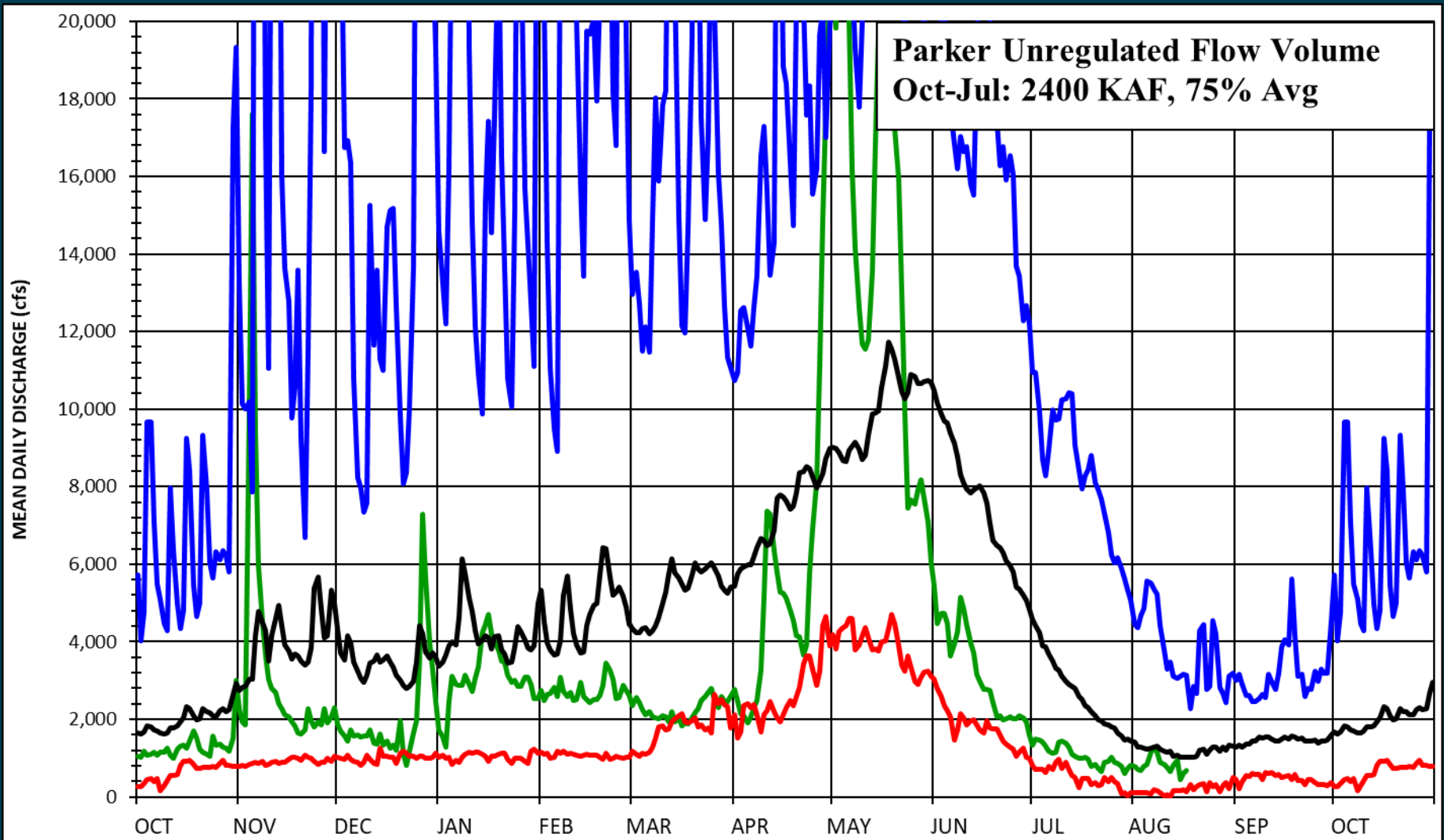
— Maximum — Average
 — Minimum — WY2022
 —●— WY 2023

YAKIMA BASIN
 Combined Cumulative Precipitation
 5 Reservoir Sites
 WATER YEARS 1981-2010

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 YAKIMA FIELD OFFICE
 1917 MARSH ROAD
 YAKIMA, WA 98901



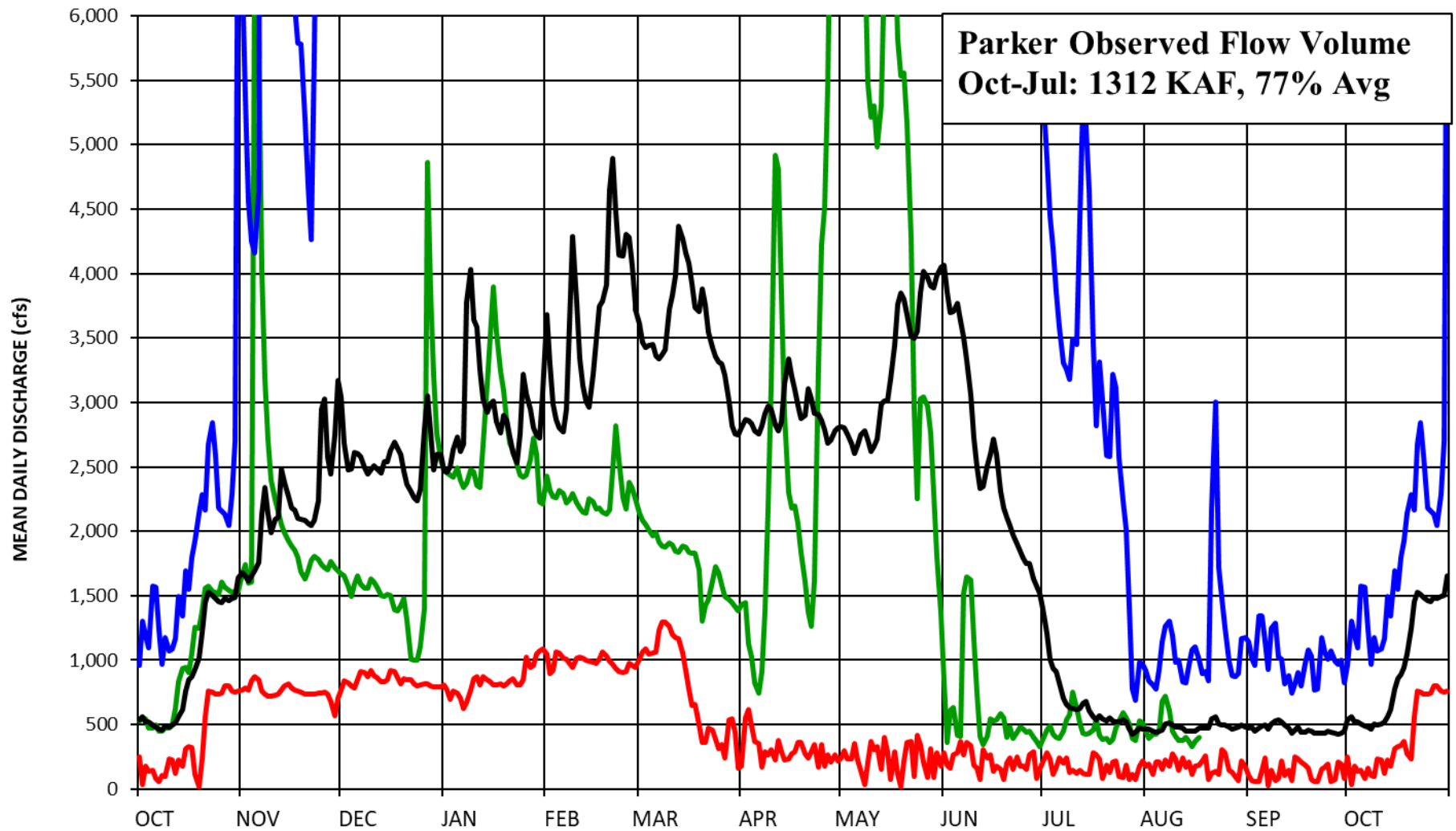




- Water Year 2023
- Minimum
- Average
- Maximum

**YAKIMA RIVER NEAR PARKER
MEAN DAILY UNREGULATED DISCHARGE
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA FIELD OFFICE
1917 MARSH ROAD
YAKIMA, WA 98901

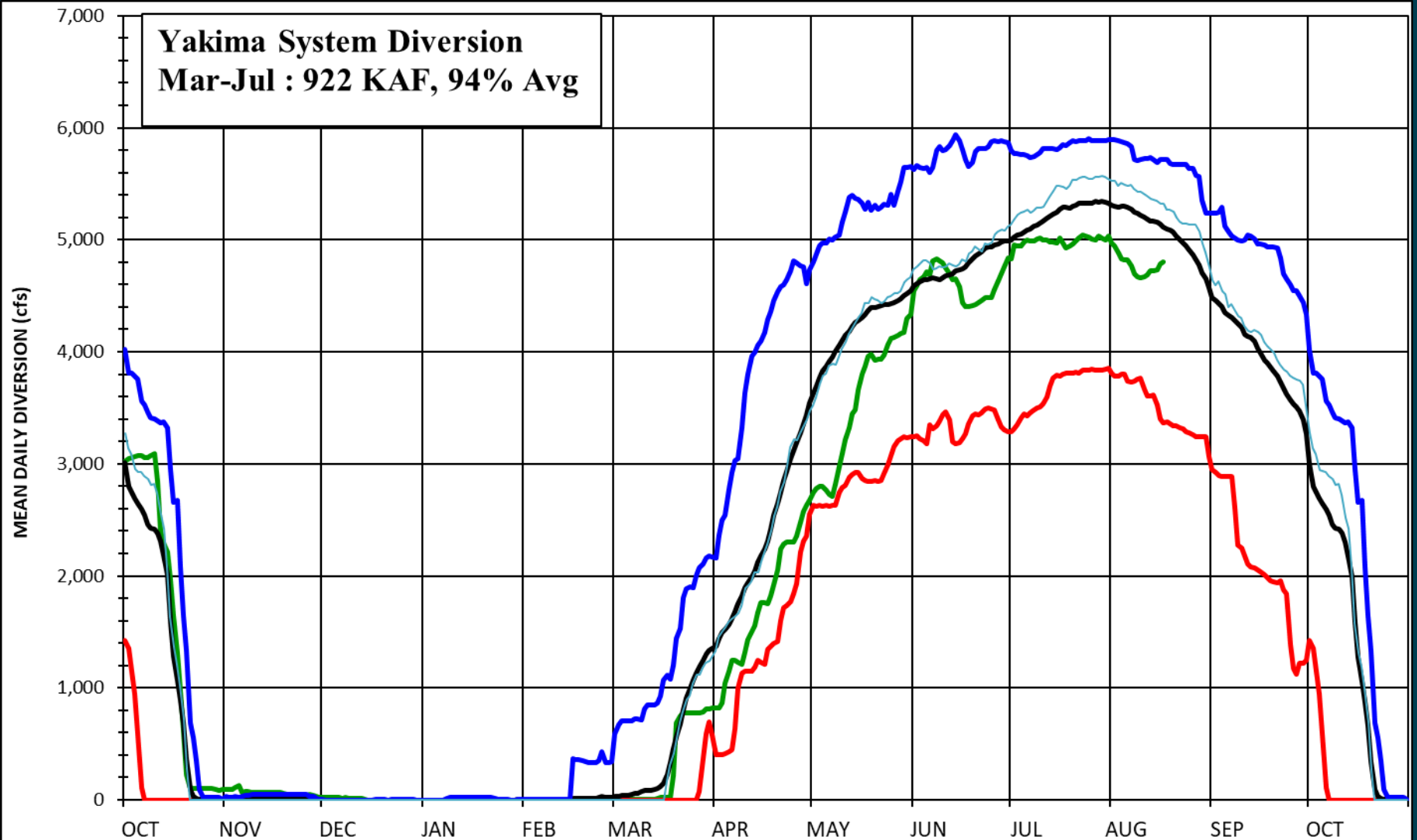


— Water Year 2023
— Minimum
— Average
— Maximum

**YAKIMA RIVER NEAR PARKER
MEAN DAILY REGULATED DISCHARGE
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

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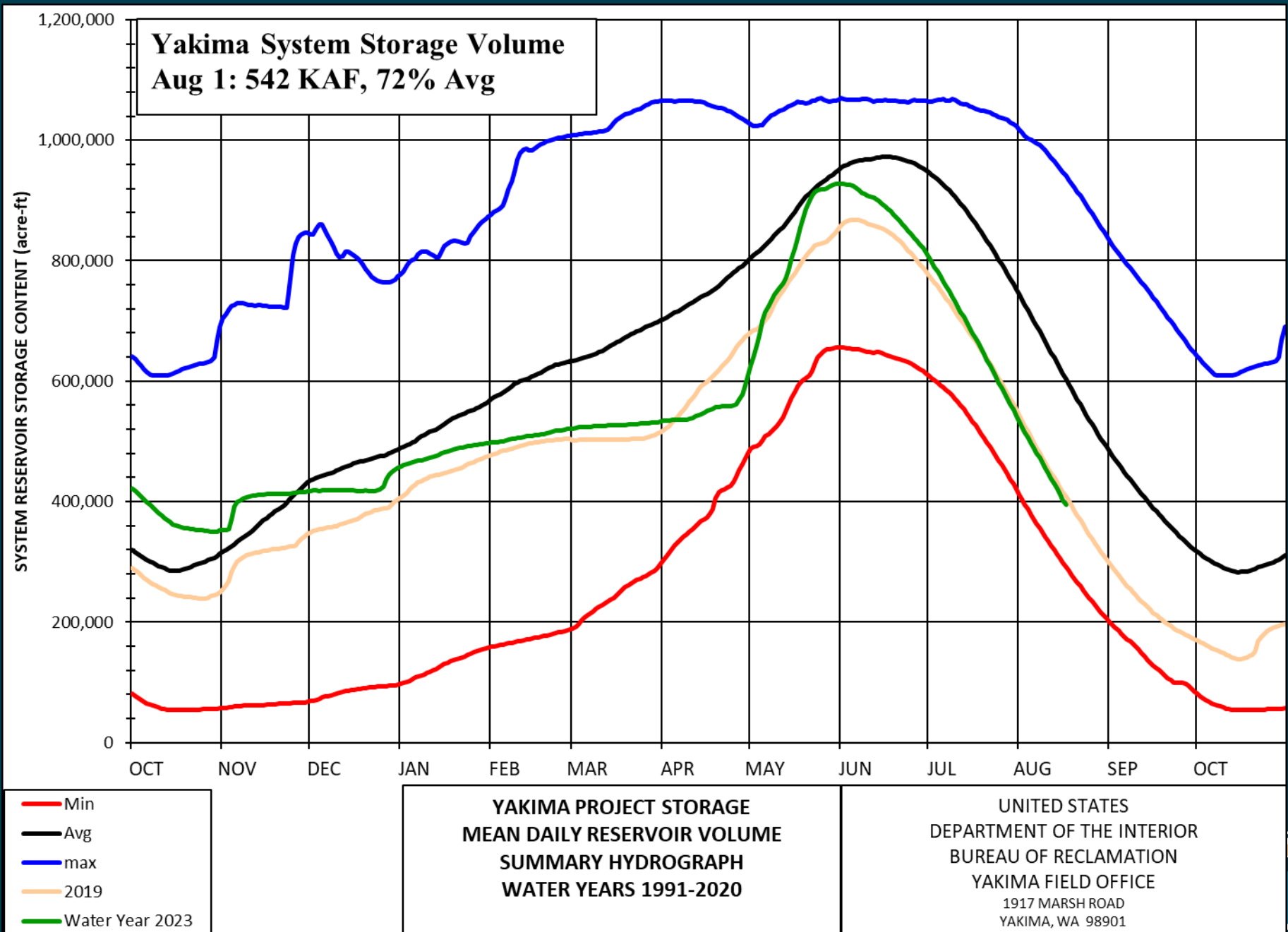
**Yakima System Diversion
Mar-Jul : 922 KAF, 94% Avg**



- Water Year 2023
- Minimum
- Average
- Maximum
- 0.5

**5 MAJOR IRRIGATION DIVERSIONS
YAKIMA R. ABOVE PARKER
SUMMARY HYDROGRAPH
WATER YEARS 1981-2010**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA FIELD OFFICE
1917 MARSH ROAD
YAKIMA, WA 98901



August 1, 2023 TWSA ESTIMATE

June 1 - September 30

| Parameter* | +/-/= | Low | Adopted | High |
|--|---------------|-------------|-------------|-------------|
| June 1-Sep 30 Natural Flow at Parker est. | + | 336 | 402 | 470 |
| Return Flow Estimate | + | 235 | 235 | 250 |
| June 1, Reservoir Content | + | 928 | 928 | 928 |
| TWSA | = | 1499 | 1565 | 1648 |
| SEP 30 EST RESERVOIR CONTENT | - | 76 | 76 | 76 |
| EST FLOW OVER SUNNYSIDE DAM | - | 110 | 110 | 110 |
| TWSA FOR IRRIGATION | = | 1313 | 1379 | 1462 |
| NONPRORATABLE ENTITLEMENT | - | 723 | 723 | 723 |
| REMAINING TWSA | = | 590 | 656 | 739 |
| PRORATABLE ENTITLEMENT | | 917 | 917 | 917 |
| % RATIO= REMAINING TWSA/PRORATABLE ENTITLEMENT | | 64% | 72% | 81% |
| TITLE 12 FLOW REQUIREMENTS, cfs | August | 300 | 300 | 300 |
| Flow available to Title 12, cfs *** | | 164 | 167 | 169 |
| Non-storeable Portion of added flow, cfs | | 72 | 72 | 72 |
| Storable portion of added flow, cfs | | 92 | 95 | 97 |

*Values are in 1,000 ac-ft unless otherwise specified.

*** State & YRBWEP Trust, Acquisition, & Conservation additions to Title XII flow range from 163 to 168 cfs.



August 2023 TWSA Comparison

June 1 - September 30

| Parameter | "+/-/=" | Jun 2023 | Jul 2023 | Aug 2023 |
|---|---------|-------------|-------------|-------------|
| June 1-Sep 30 Natural Flow at Parker est. | + | 502 | 402 | 402 |
| Return Flow Estimate | + | 235 | 235 | 235 |
| June 1, Reservoir Content | + | 928 | 928 | 928 |
| TWSA | = | 1665 | 1565 | 1565 |
| SEP 30 EST RESERVOIR CONTENT* | - | 76 | 76 | 76 |
| FLOW OVER SUNNYSIDE DAM | - | 161 | 110 | 110 |
| TWSA FOR IRRIGATION | = | 1428 | 1379 | 1379 |
| NONPRORATABLE ENTITLEMENT | - | 723 | 723 | 723 |
| REMAINING TWSA | = | 705 | 656 | 656 |
| PRORATABLE ENTITLEMENT | | 917 | 917 | 917 |
| % RATIO= REMAINING TWSA/PRORATABLE ENTITLEMENT | | 77% | 72% | 72% |
| TITLE XII FLOW REQUIREMENTS, cfs | January | 300 | 300 | 300 |
| TOTAL FLOW AVAILABLE AT PARKER, cfs ** | | 474 | 472 | 467 |

*Values are in 1,000 ac-ft unless otherwise specified.



Yakima Basin Minimum Flows

Table 3-3. Minimum winter instream flow targets (cfs).

| | Minimum Flow (cfs) by Water Year Type | | |
|----------|---------------------------------------|--------------|--------------|
| Location | Dry | Average | Wet |
| KEE | Inflow - 80 | 100 | 120 |
| KAC | Inflow - 30 | 30 | 30 |
| EASW | 190 | 250 | 300 |
| CLE | Inflow - 180 | 220 | 250 |
| BUM | Inflow - 130 | Inflow - 130 | Inflow - 130 |
| RIM | Inflow - 50 | 75 | 90 |
| TICW | 75 | 100 | 120 |

- El Nino winter 2023-2024, indicates winters having near to below average precip and warmer than normal temps.
- Nov 1 carry-over of less than 150 KAF
- These call for Spawning flows set to the low range:
- Kee-80, Kac-30, Easw-190, Cle-180, Bum-130, Rim-50, Ticw-75 cfs.

Hydrologic Summary

- Storage control and prorationing started June 1
- TWSA: remained at 1.57 MAF, 72% of average
- Title XII plus added waters: 372 cfs
- Prorationing: holding at 72%
- Storable conservation est (Jun1-Oct15): 26 KAF
- Carry-over will be very low