



Office of the Washington State Climatologist



Current Conditions and Seasonal Outlook

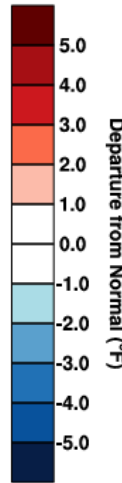
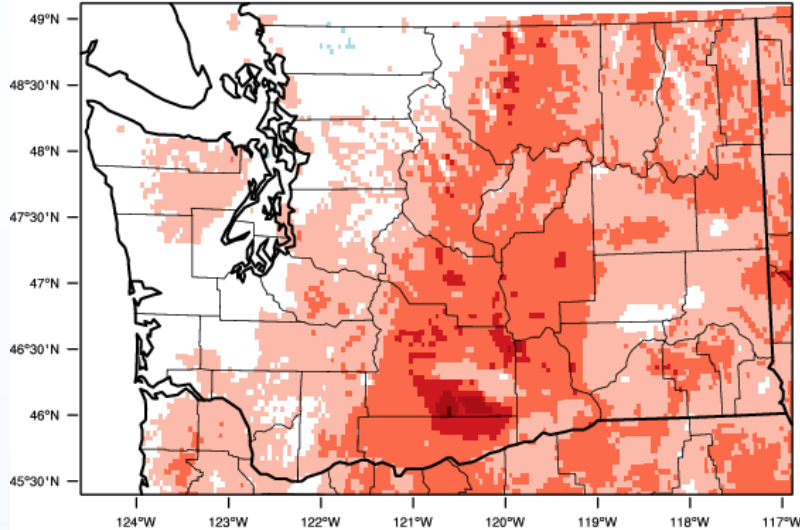
Nick Bond & Karin Bumbaco
Office of the Washington State Climatologist
Cooperative Institute for Climate, Ocean, and Ecosystem Studies
University of Washington
16 August 2021

2021 Water Year

Temperature

Washington - Mean Temperature

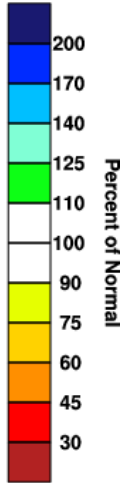
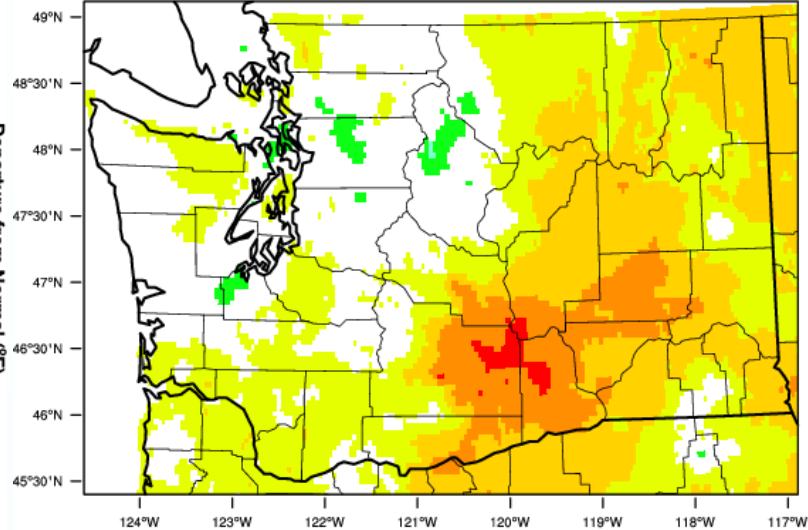
October-July 2021 Departure from 1981-2010 Normal



Precipitation

Washington - Precipitation

October-July 2021 Percent of 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 AUG 2021

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WWDI

- Averaged statewide, WY 2021 warmer than normal (+1.9°F), tying as 7th warmest*
- Averaged statewide, below normal precipitation for WY 2021 (-4.24")

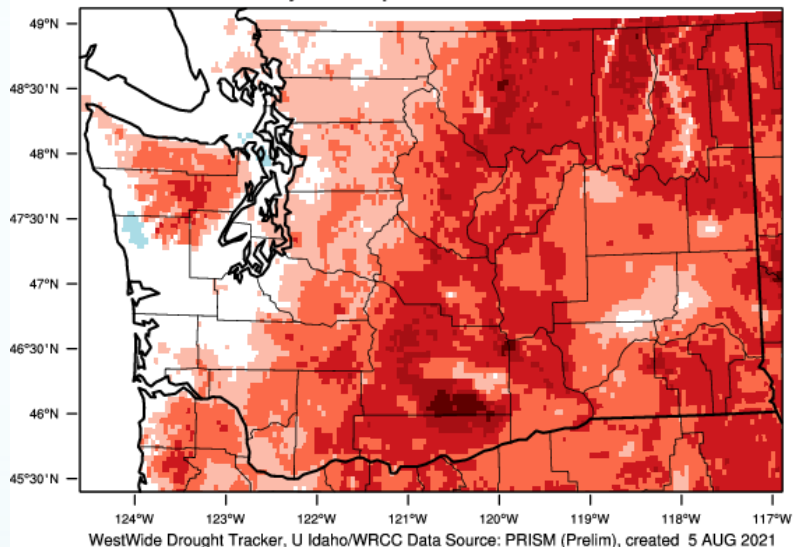
*Records since 1895

March-July 2021

Temperature

Washington - Mean Temperature

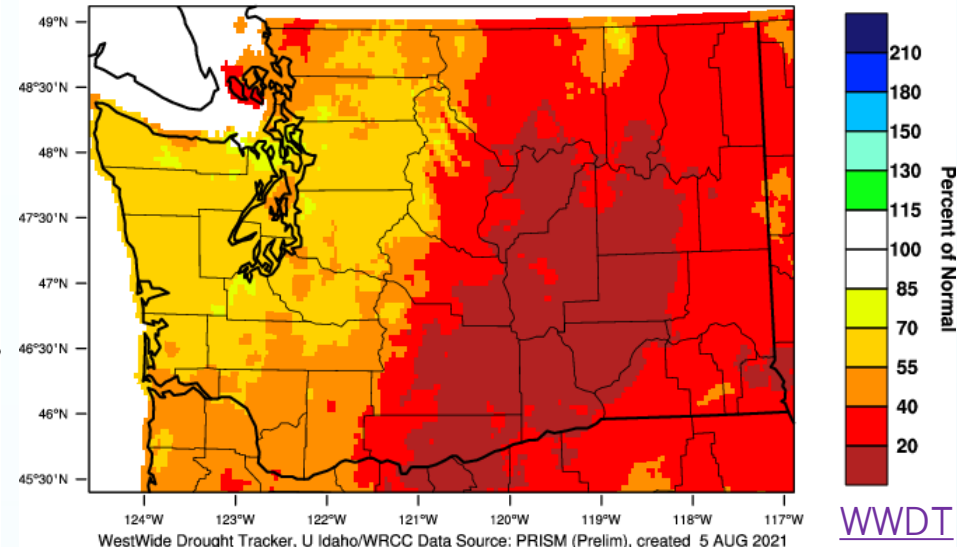
March-July 2021 Departure from 1981-2010 Normal



Precipitation

Washington - Precipitation

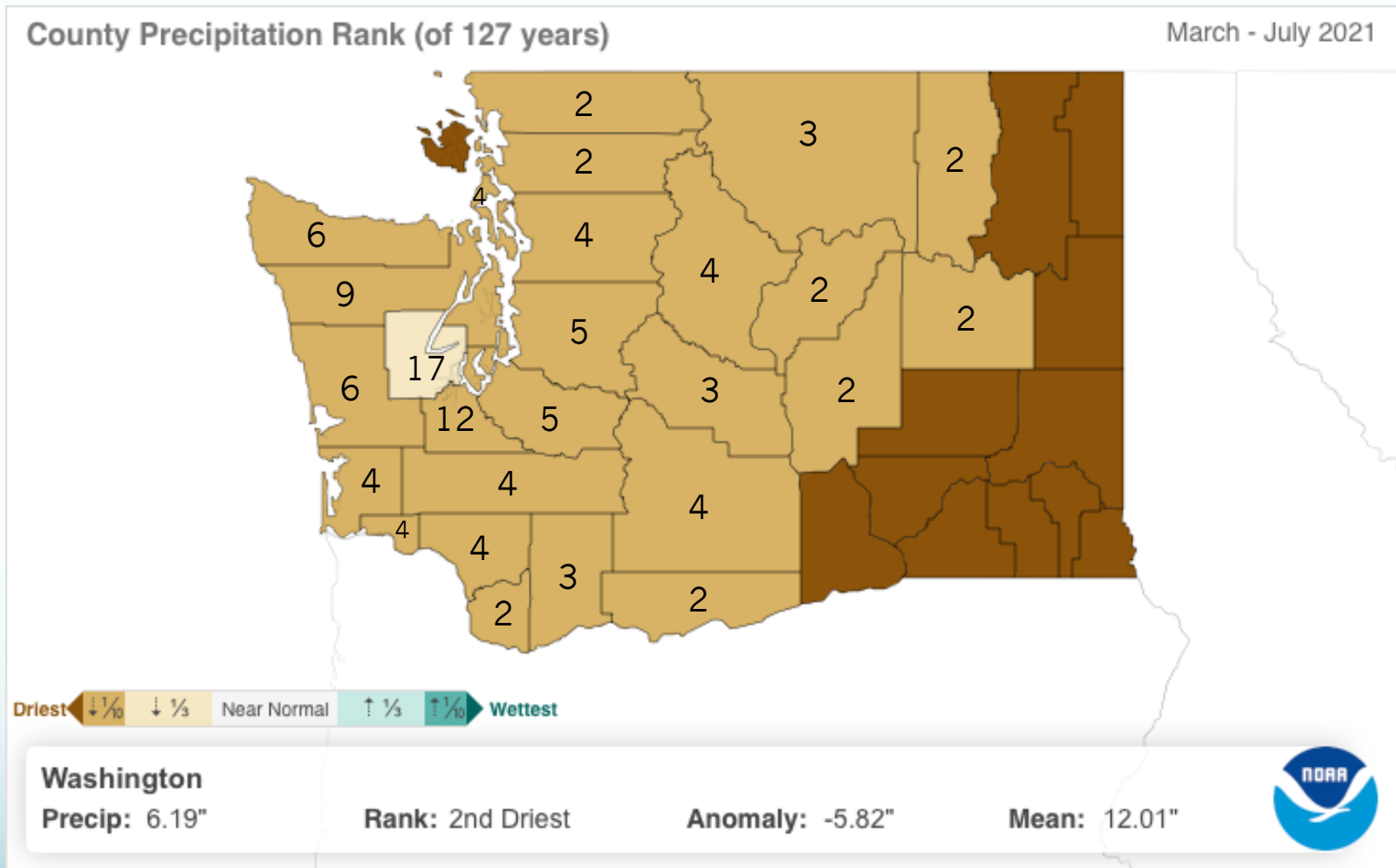
March-July 2021 Percent of 1981-2010 Normal



- Averaged statewide, 3rd warmest* March-July on record (+2.8°F)
- Averaged statewide, 2nd driest* March-July on record (-6.83")

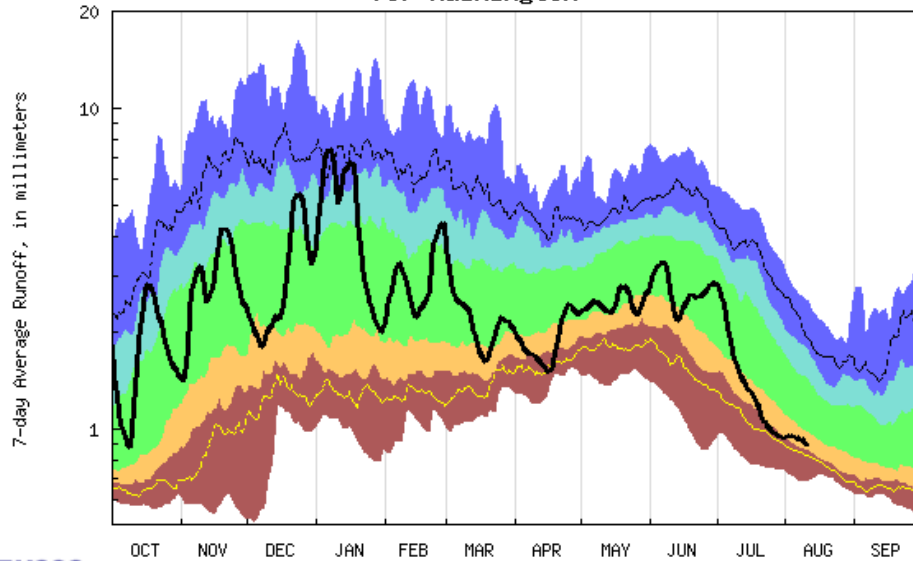
*Records since 1895

March-July County Precipitation



Streamflow

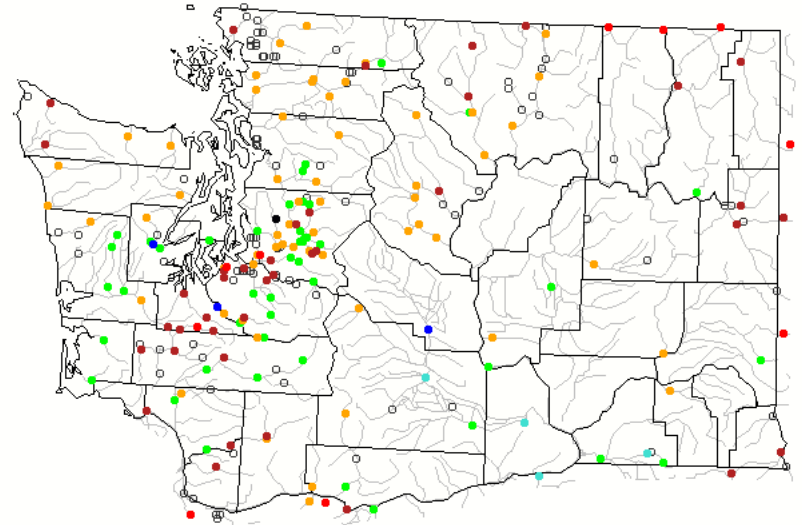
Duration hydrograph of 7-day average runoff for Washington



USGS WaterWatch

Last updated: 2021-08-12

Wednesday, August 11, 2021



USGS

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		Runoff

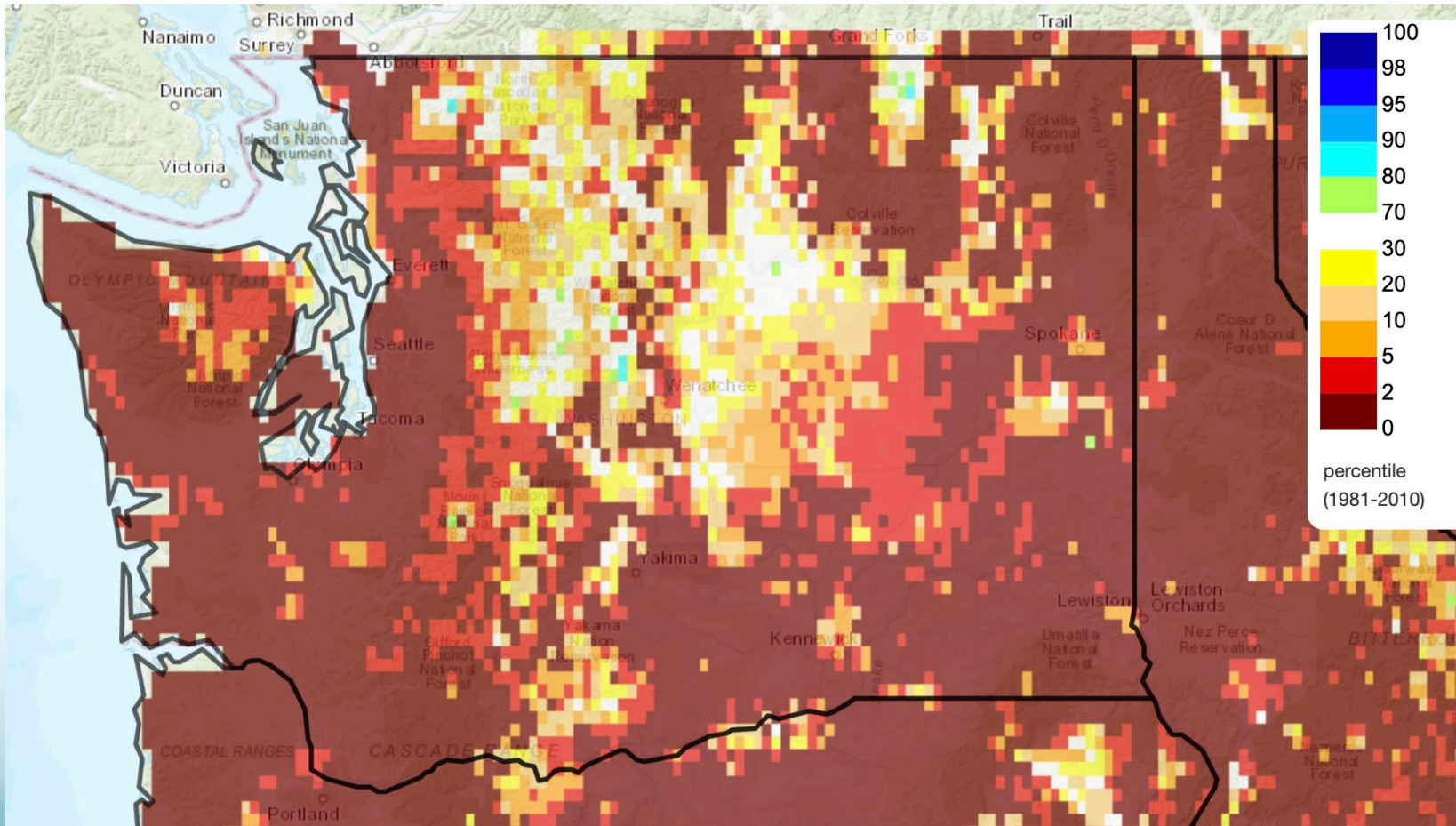
Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

USGS

Soil Moisture

Soil Moisture Percentile

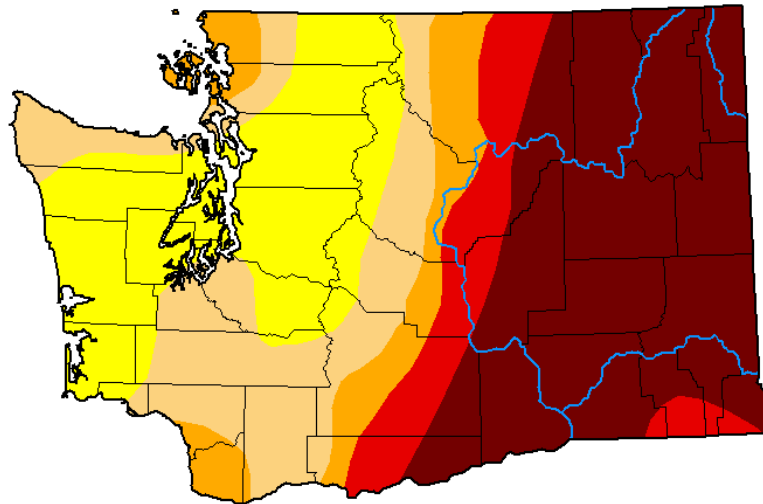
2021/08/10



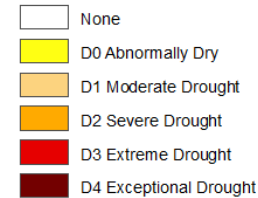
Drought Monitor

U.S. Drought Monitor
Washington

August 10, 2021
(Released Thursday, Aug. 12, 2021)
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:

Richard Tinker
CPC/NOAA/NWS/NCEP



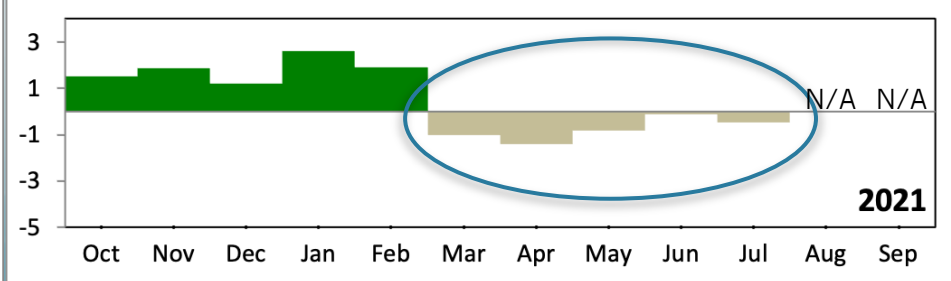
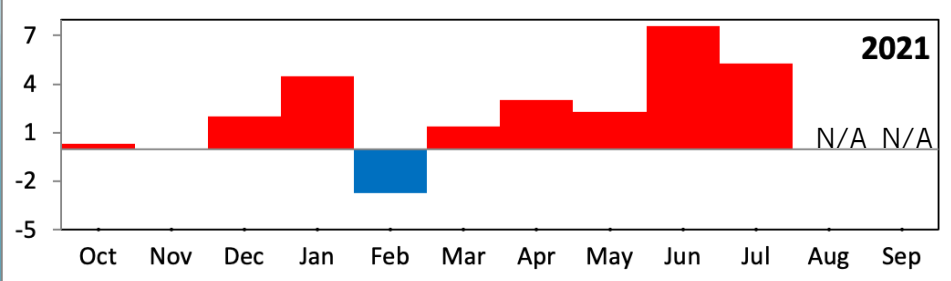
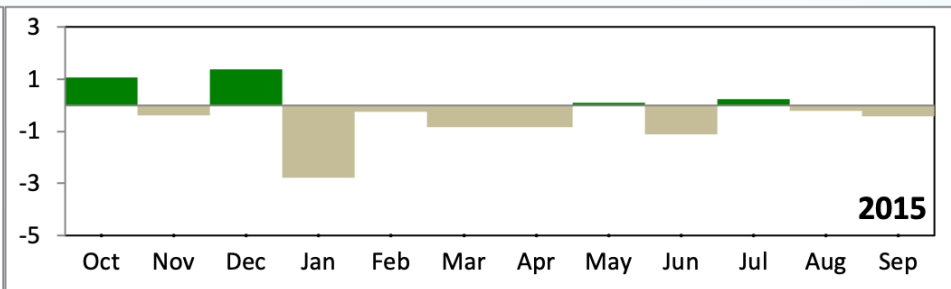
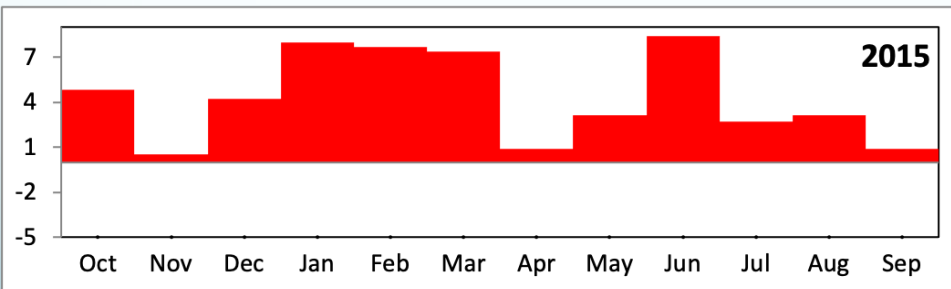
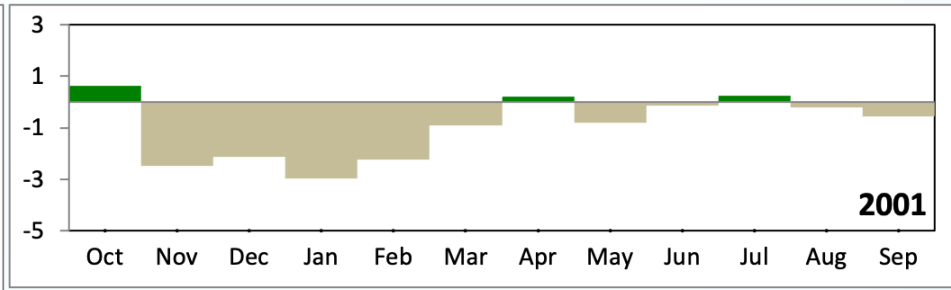
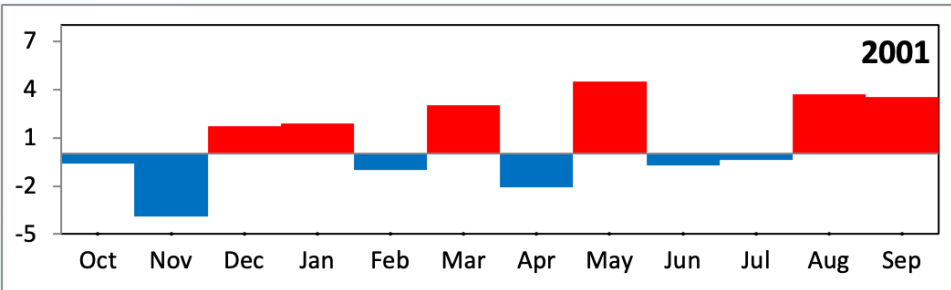
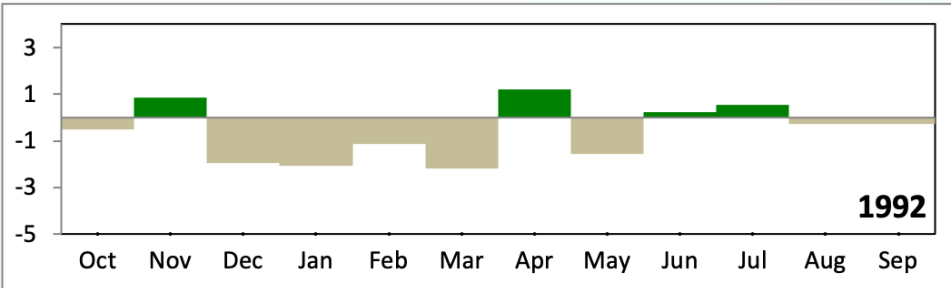
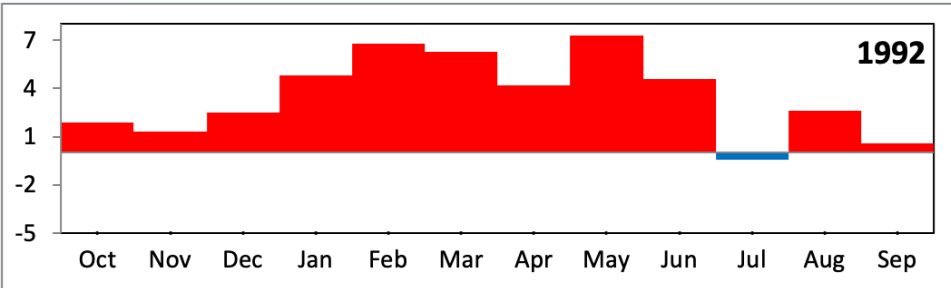
droughtmonitor.unl.edu

- D3 (3-5th percentile conditions; once every 20-50 years); D4 (0-2nd percentile; once or twice every 100 years)

Historical Droughts

Statewide Temperature Anomalies

Statewide Precipitation Anomalies



Summer Temperature Trends

Year Range [?]
 1895 ————— 2020

Variable Selection [?]
 Average Temperature

Time Frame [?]
 Summer (JJA)

Trend Range [?]
 Over Selected Year Range

Trend [?] - 0 +

Significant (S) ● ○ ●

Not Significant (NS) ● ○ ●

Insufficient Data (I) ● ● ●

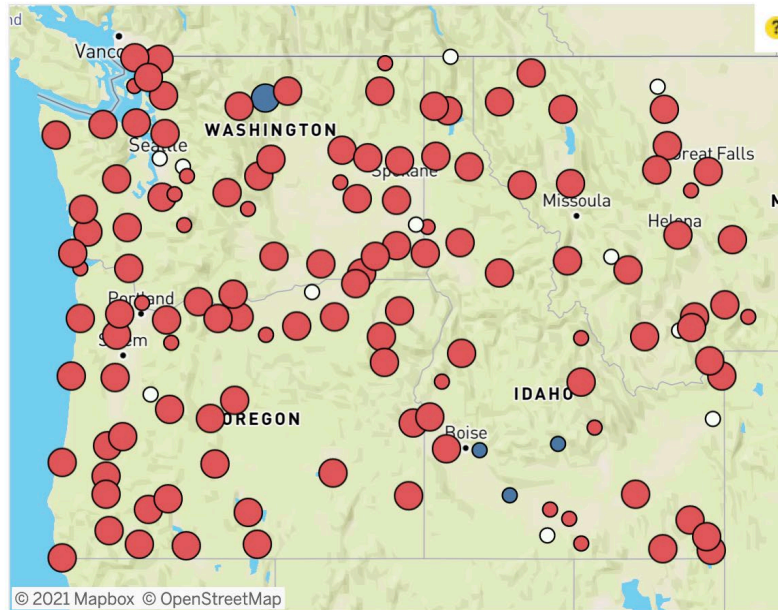
Add to Graph [?]

None

Average

Statewide Average

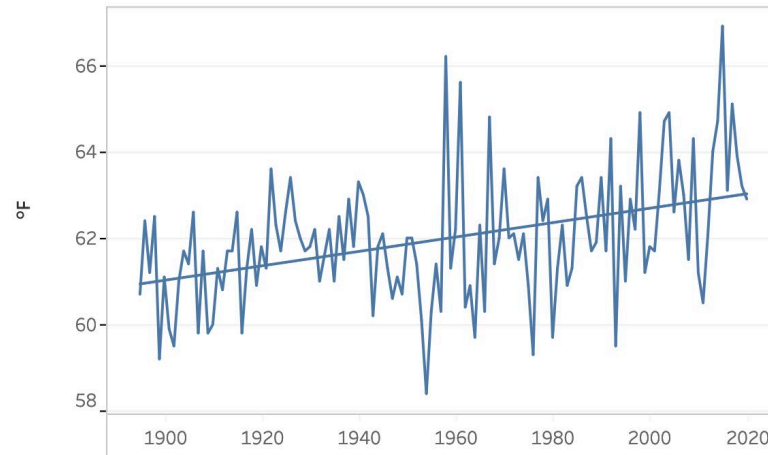
Trend Line



Summer (JJA) Average Temperature 1895-2020

Trend Data (°F Over Selected Year Range) [?]

ID	+ 1.94	■
MT	+ 1.94	■
OR	+ 2.92	■
WA	+ 2.08	■

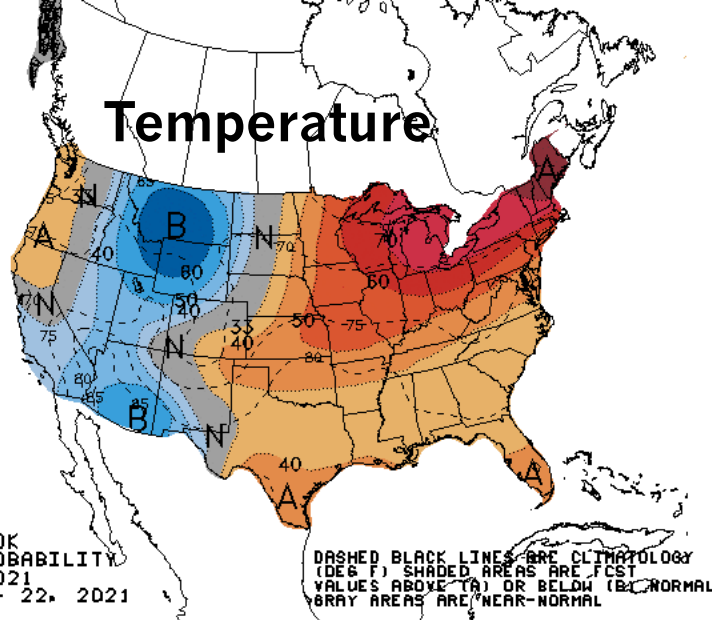


Station Data Source: NOAA's U.S. Historical Climatology Network version 2.5.5.20210712

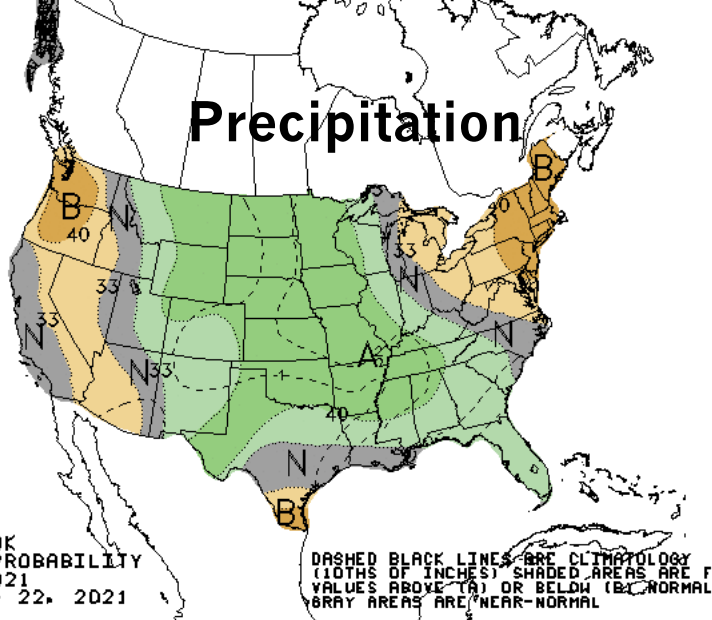
Statewide Data Source: NOAA's US Climate Division Dataset (nClimDiv)

<https://climate.washington.edu/climate-data/trendanalysisapp/>



Temperature

6-10 day



Precipitation



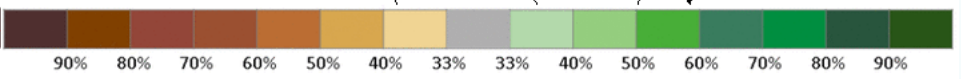
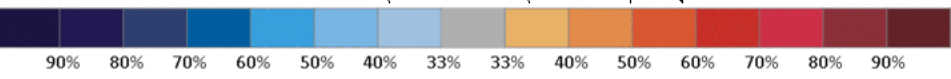
6-10 DAY OUTLOOK
TEMPERATURE PROBABILITY
MADE 12 AUG 2021
VALID AUG 18 - 22, 2021

DASHED BLACK LINES ARE CLIMATOLOGY (DEG F) SHADED AREAS ARE FCS VALUES ABOVE (A) OR BELOW (B) NORMAL GRAY AREAS ARE NEAR-NORMAL



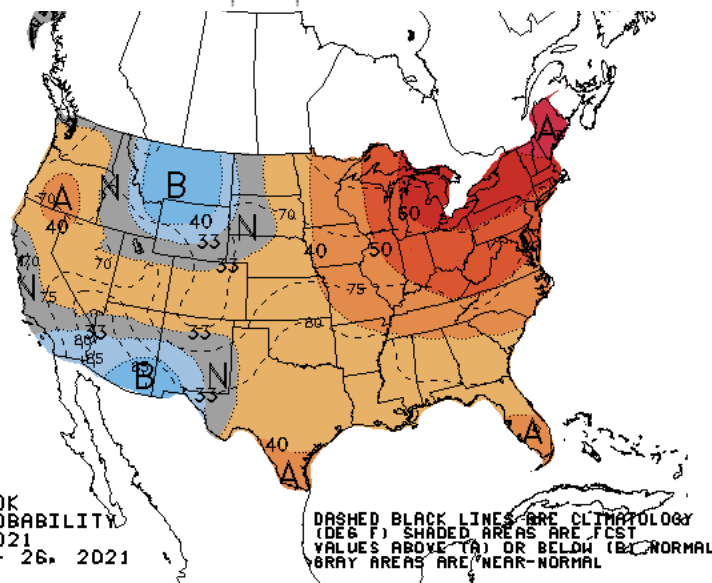
6-10 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 12 AUG 2021
VALID AUG 18 - 22, 2021

DASHED BLACK LINES ARE CLIMATOLOGY (TENTHS OF INCHES) SHADED AREAS ARE FCS VALUES ABOVE (A) OR BELOW (B) NORMAL GRAY AREAS ARE NEAR-NORMAL

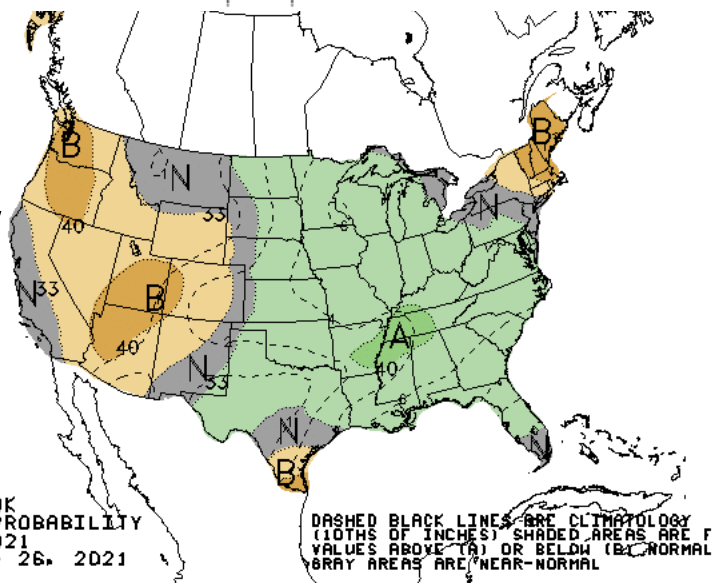


Probability of Below | Normal | Probability of Above

Probability of Below | Normal | Probability of Above



8-14 day



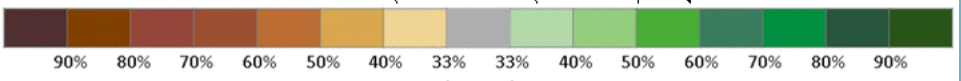
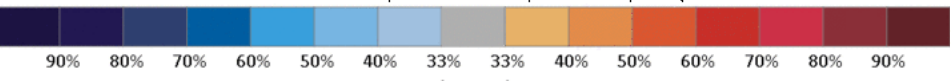
8-14 DAY OUTLOOK
TEMPERATURE PROBABILITY
MADE 12 AUG 2021
VALID AUG 20 - 26, 2021

DASHED BLACK LINES ARE CLIMATOLOGY (DEG F) SHADED AREAS ARE FCS VALUES ABOVE (A) OR BELOW (B) NORMAL GRAY AREAS ARE NEAR-NORMAL



8-14 DAY OUTLOOK
PRECIPITATION PROBABILITY
MADE 12 AUG 2021
VALID AUG 20 - 26, 2021

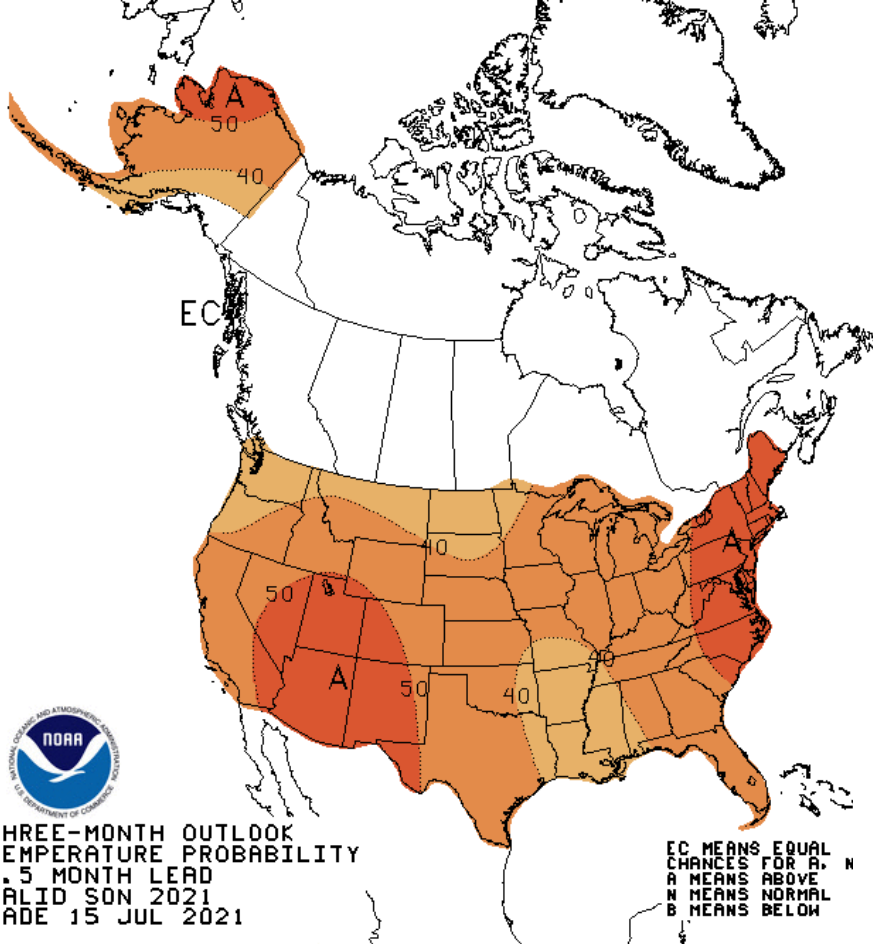
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Probability of Below | Normal | Probability of Above

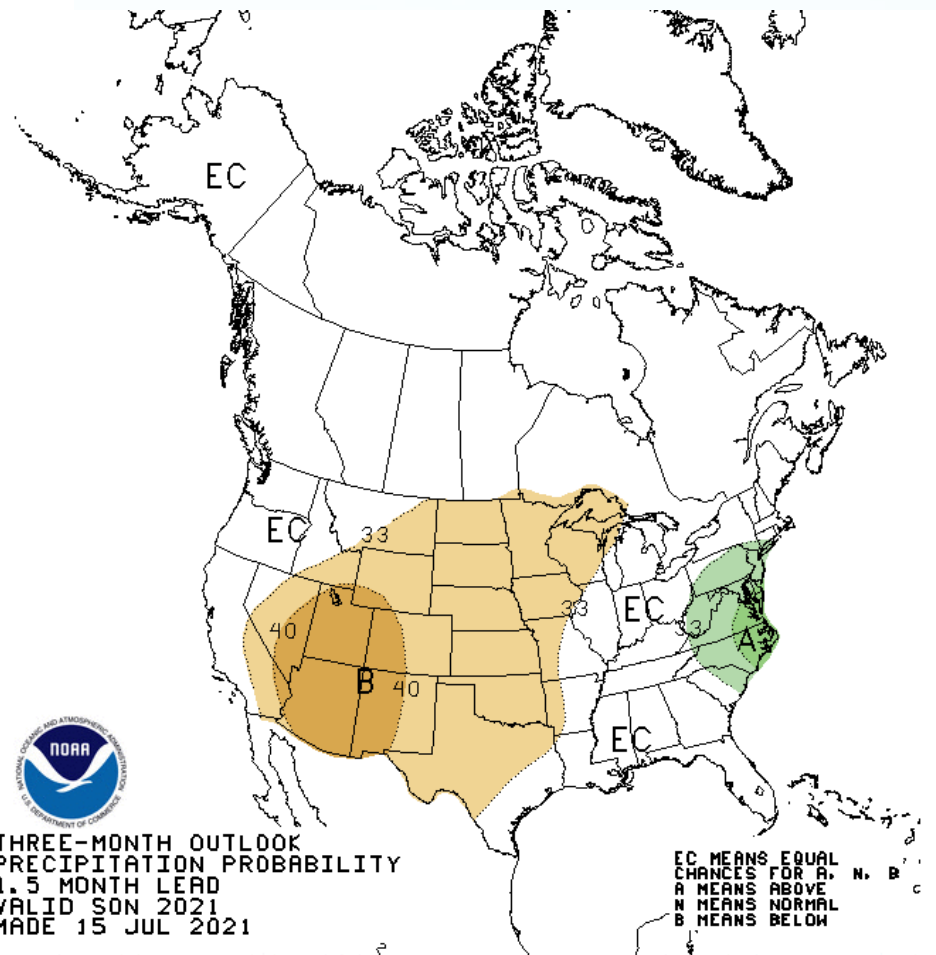
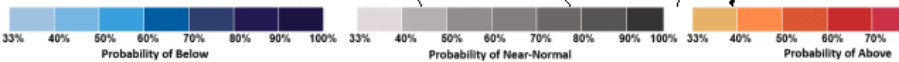
Probability of Below | Normal | Probability of Above

NOAA/CPC Forecasts for Sep-Nov 2021



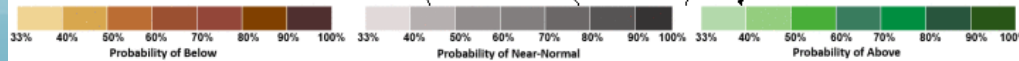
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
1.5 MONTH LEAD
VALID SON 2021
MADE 15 JUL 2021

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW



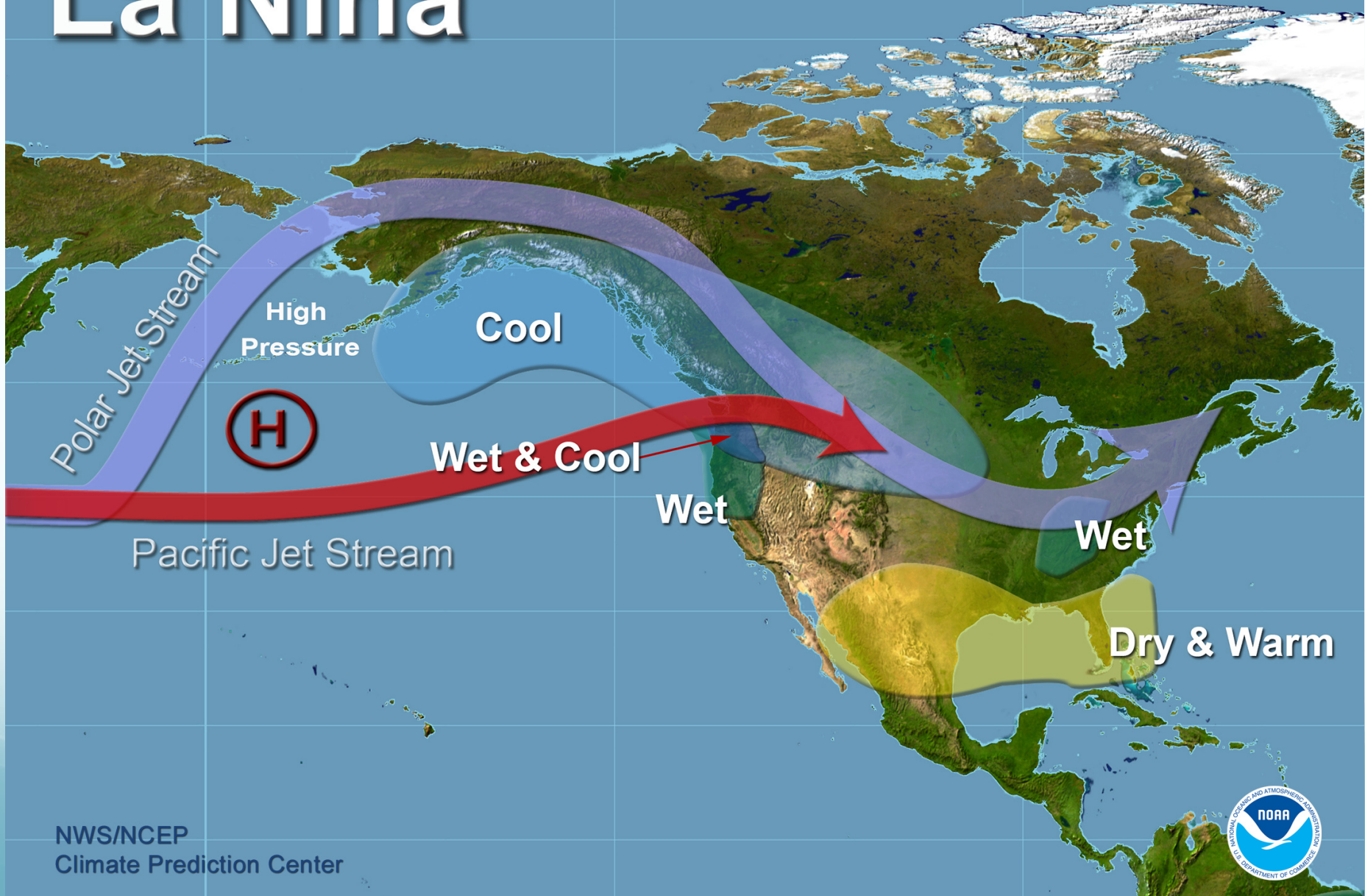
THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
1.5 MONTH LEAD
VALID SON 2021
MADE 15 JUL 2021

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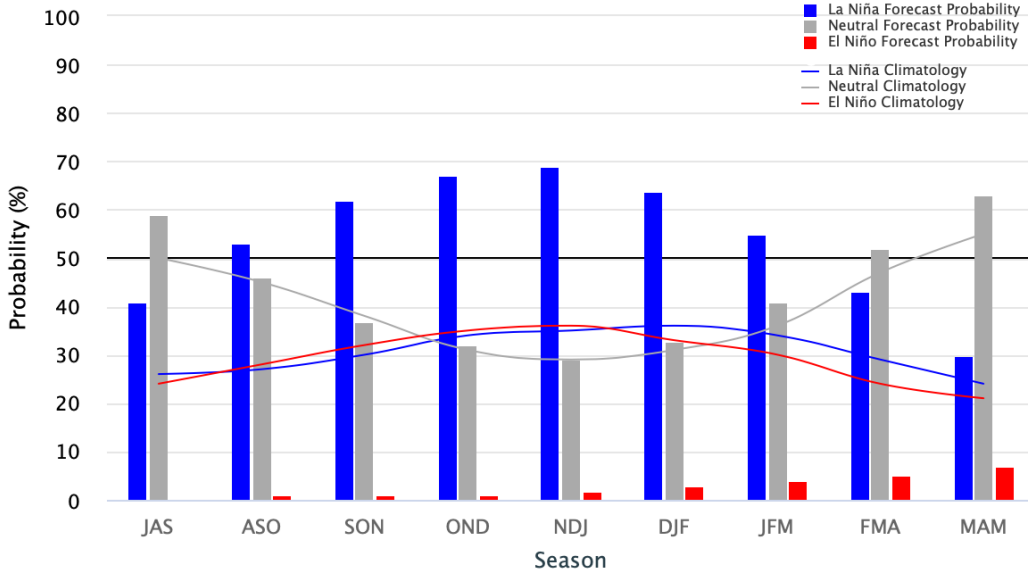
Typical Wintertime Pattern

La Niña



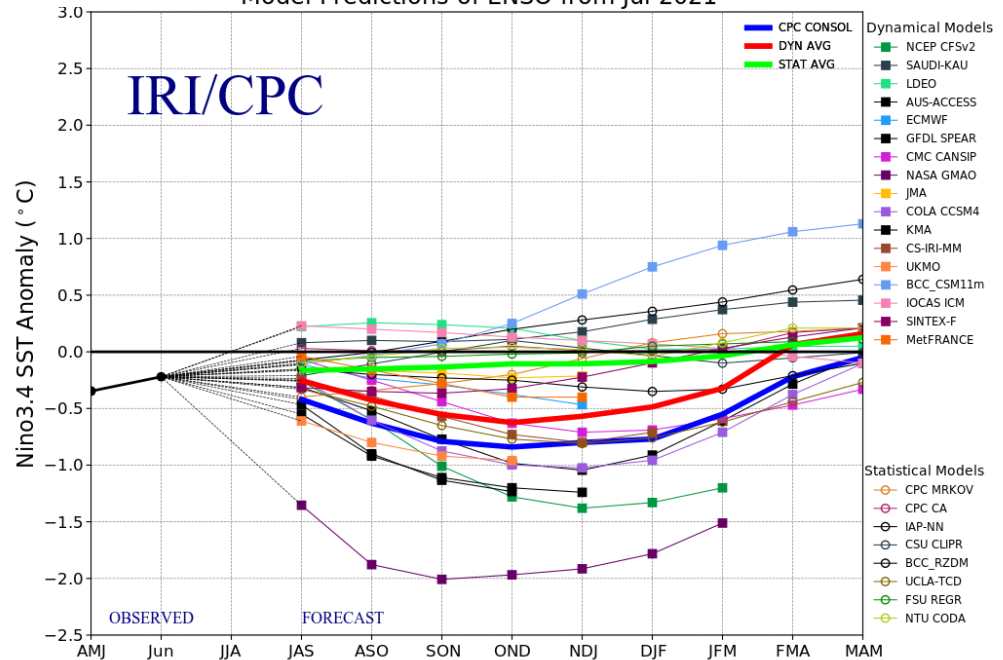
Early-August 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C

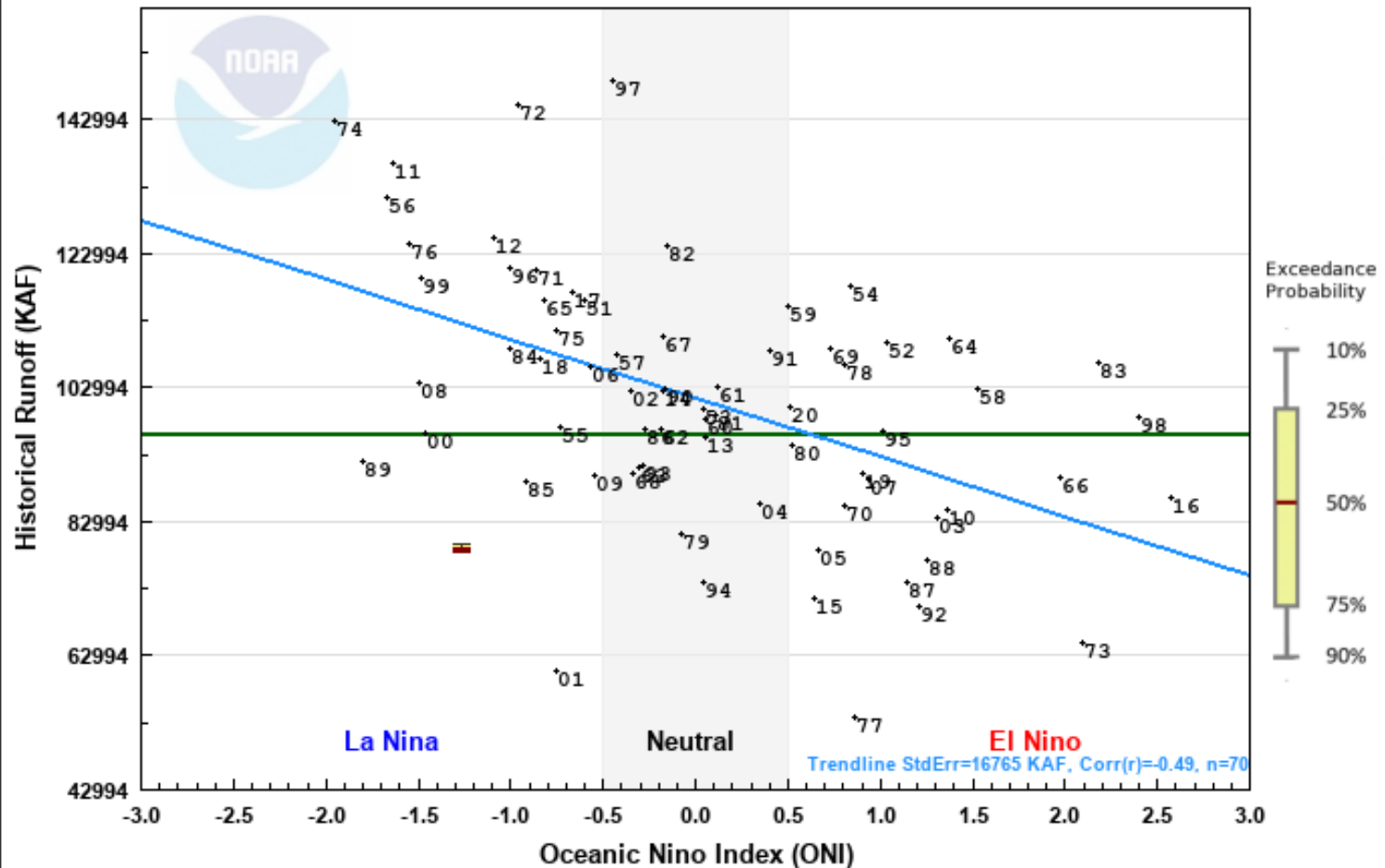


ENSO Predictions

Model Predictions of ENSO from Jul 2021



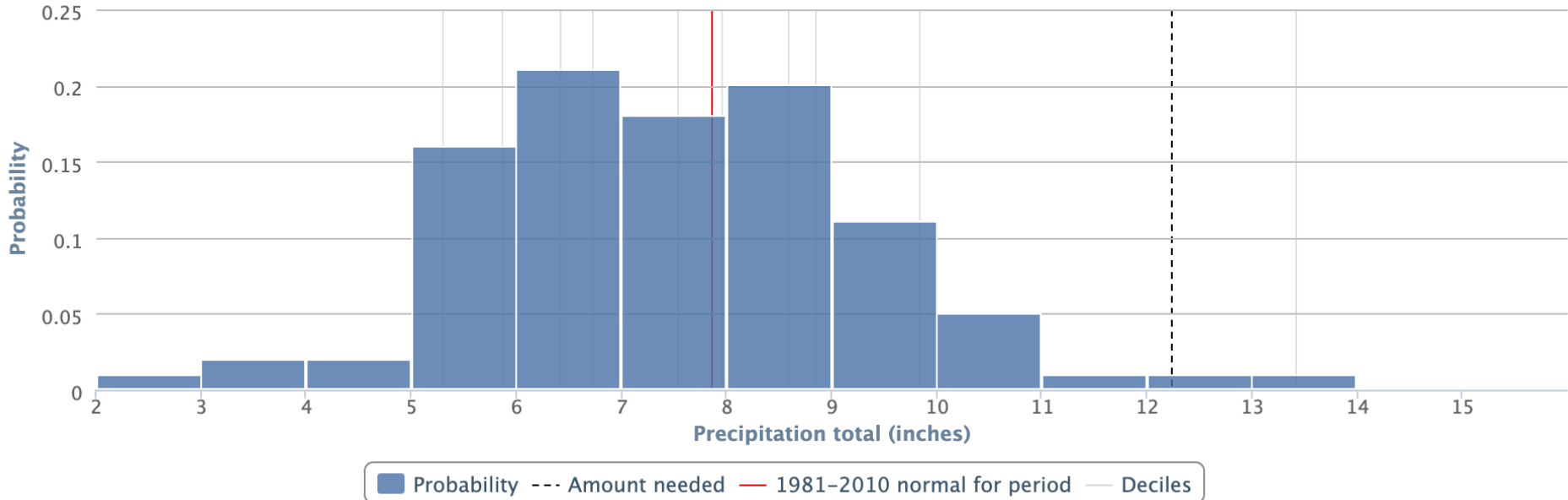
OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff (TDAO3) COLUMBIA - THE DALLES DAM (1951-2020)



◆ Runoff for Given Water Year ■ Current ESP10 Forecast — ONI vs Runoff Trendline — 30 Year Normal (1981-2010)

Chance of Enough Precipitation to Bring the Annual Total to Normal: Ritzville, WA

Probability Density Function for 08-10 through 02-28 for precipitation at RITZVILLE 1 SSE, WA
based on observed data in station record



There is a 1.22% chance of reaching/exceeding normal by end of recovery period based on 82 periods in station record.

Powered by ACIS

Western Regional Climate Center

Analysis for: RITZVILLE 1 SSE, WA [? How to interpret graph](#)

Precipitation accumulated from 2021-03-01 to 2021-08-09:
0.51 in. (0 missing days)

There is a deficit of 4.37 in. for this period.
Normal for this period is 4.88 in.

Amount needed to reach/exceed normal by 2022-02-28:
12.24 in.

Likelihood of recovery between 2021-08-10 and 2022-02-28:
1.22%

82 of 122 records used based on station record 1899-03-01 to 2021-08-09

Summary

- Many droughts in the Pacific NW can be attributed to paltry snowpack associated with warm and/or dry winters.
- The drought of 2021 is primarily associated with the warm and dry weather that prevailed in WA during the spring (March through June).
- Over the last 50 years, our summers have become warmer (and drier).
- La Niña conditions in the tropical Pacific may help produce a decent mountain snowpack in the winter of 2021-22, but it is unlikely there will be enough precipitation to eliminate deficits in eastern WA.