

# Regional Climate Perspective

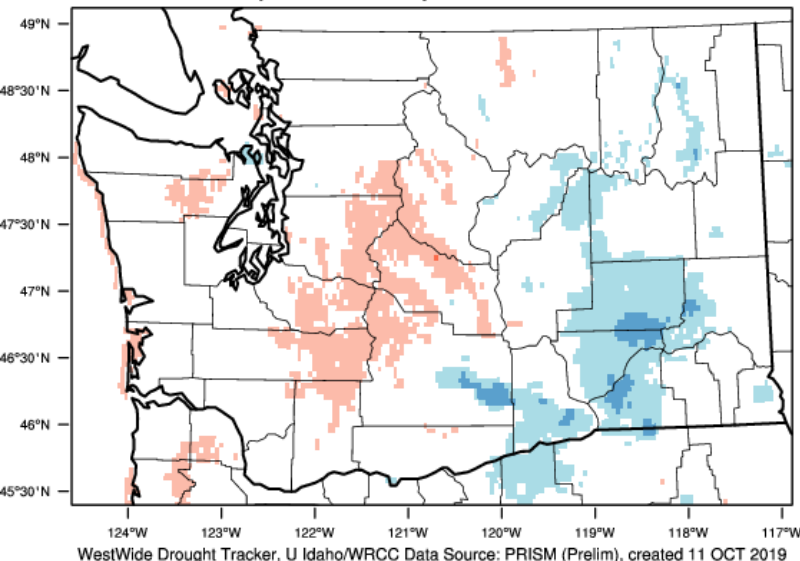
Nick Bond & Karin Bumbaco  
Office of the Washington State Climatologist  
Joint Institute for the Study of Atmosphere and Ocean  
University of Washington  
17 October 2019

# 2019 Water Year

## Temperature

### Washington - Mean Temperature

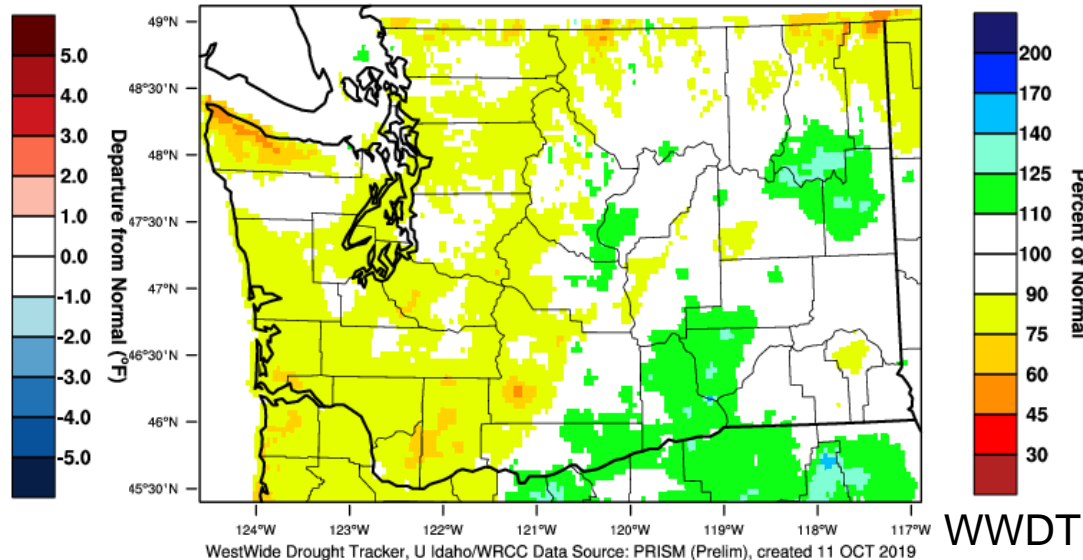
October-September 2019 Departure from 1981-2010 Normal



## Precipitation

### Washington - Precipitation

October-September 2019 Percent of 1981-2010 Normal



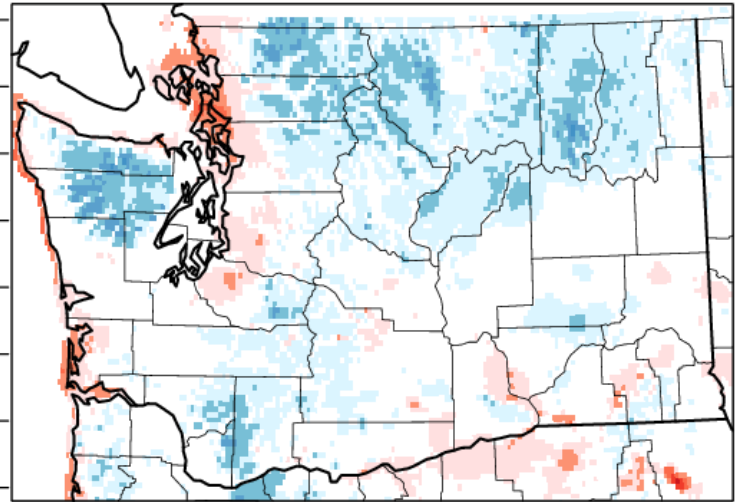
- Averaged statewide, Water Year 2019 temperatures were near-normal (+0.1°F)
- Averaged statewide, WY 2019 precipitation was below normal (-4.76"; 89% of normal) with some regional variability

# September 2019

## Temperature

### Washington - Mean Temperature

September 2019 Departure from 1981-2010 Normal

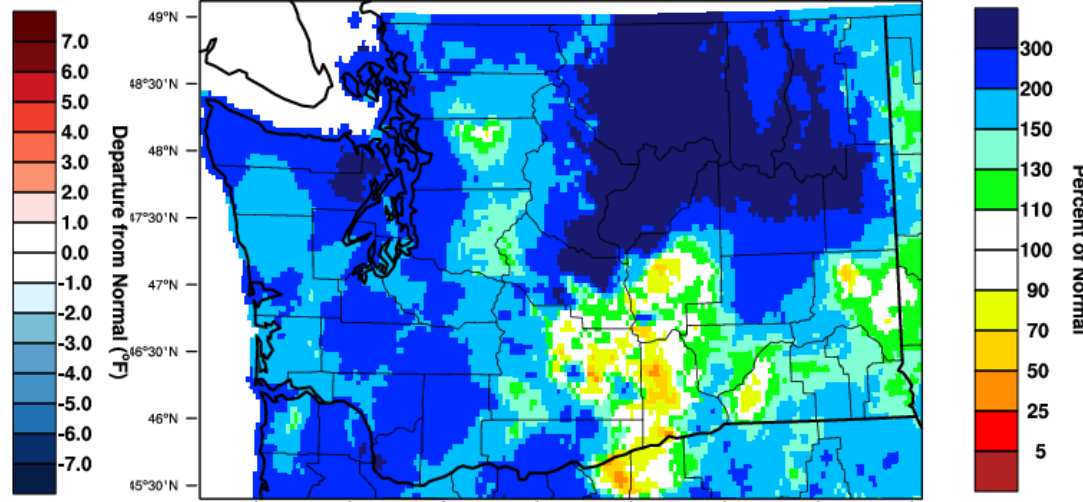


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 11 OCT 2019

## Precipitation

### Washington - Precipitation

September 2019 Percent of 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 OCT 2019

WWDT

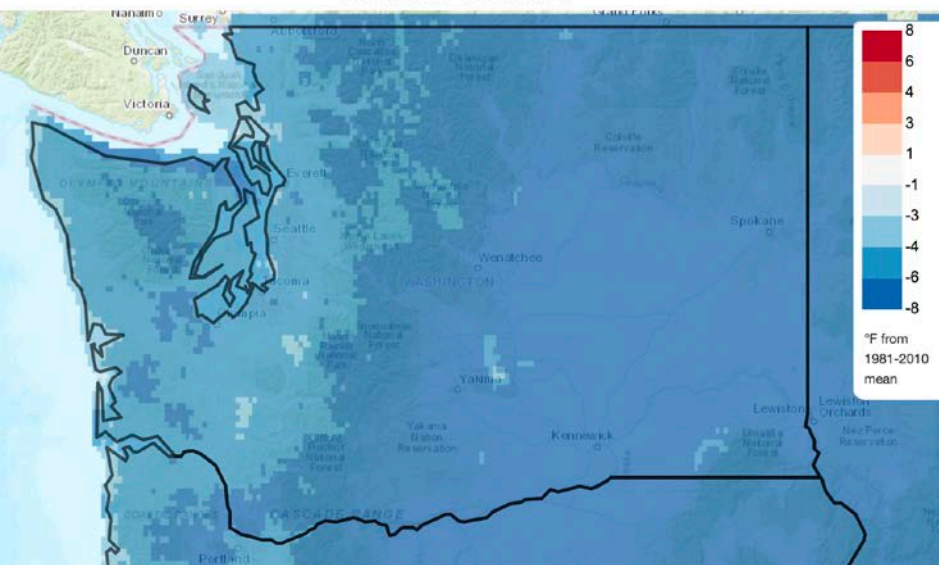
- Averaged statewide, near-normal Sept temperatures ( $-0.4^{\circ}\text{F}$ ) compared to 1981-2010, though on the cool side
- Averaged statewide, tied as the 10<sup>th</sup> wettest Sept on record (since 1895) with 226% of normal

# October 2019

## Temperature

Mean Daily Temperature Anomaly, Last 15 Days

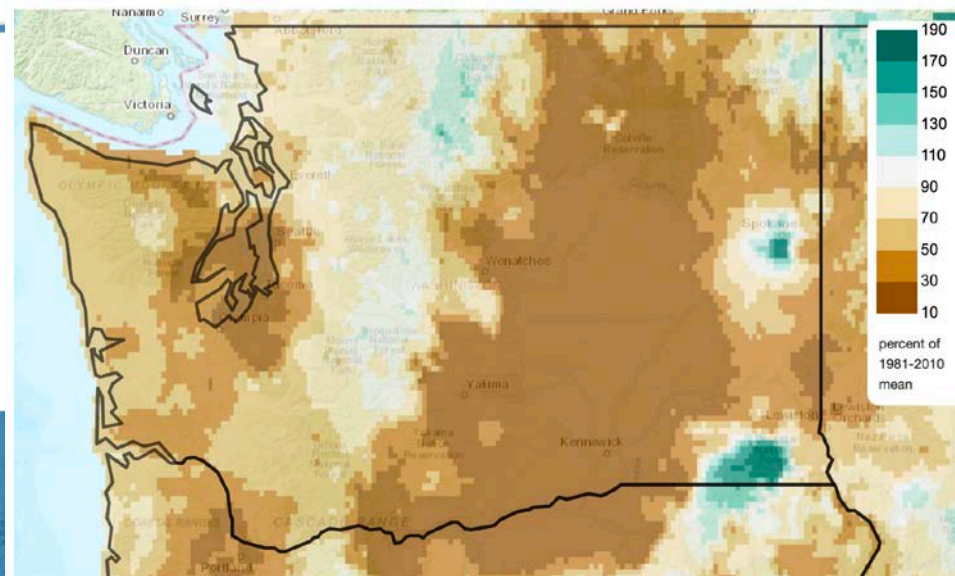
2019/09/30 - 2019/10/14



## Precipitation

Total Precipitation Anomaly, Last 15 Days

2019/09/30 - 2019/10/14

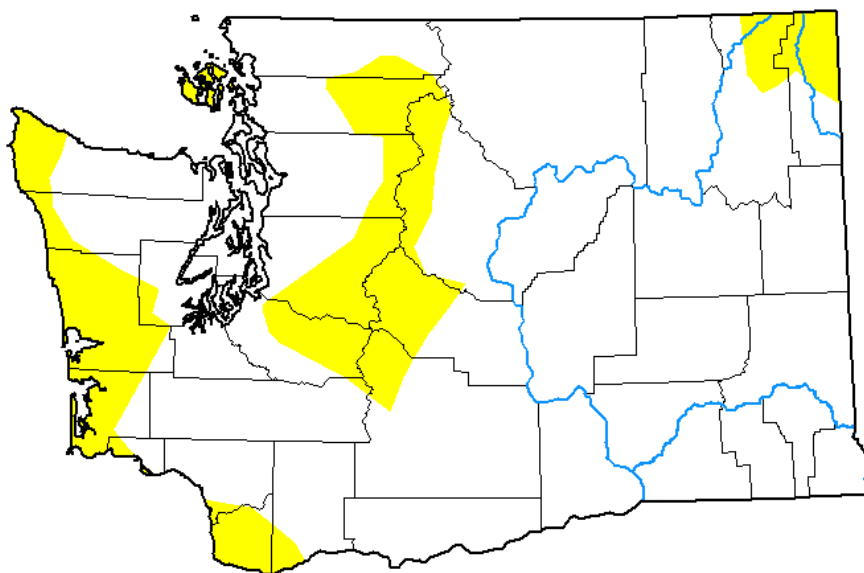


NW Climate Toolbox

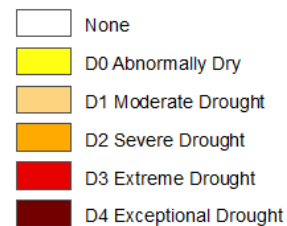
# US Drought Monitor

## U.S. Drought Monitor Washington

**October 15, 2019**  
(Released Thursday, Oct. 17, 2019)  
Valid 8 a.m. EDT



### Intensity:



*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

### Author:

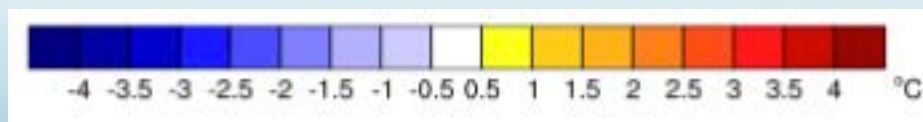
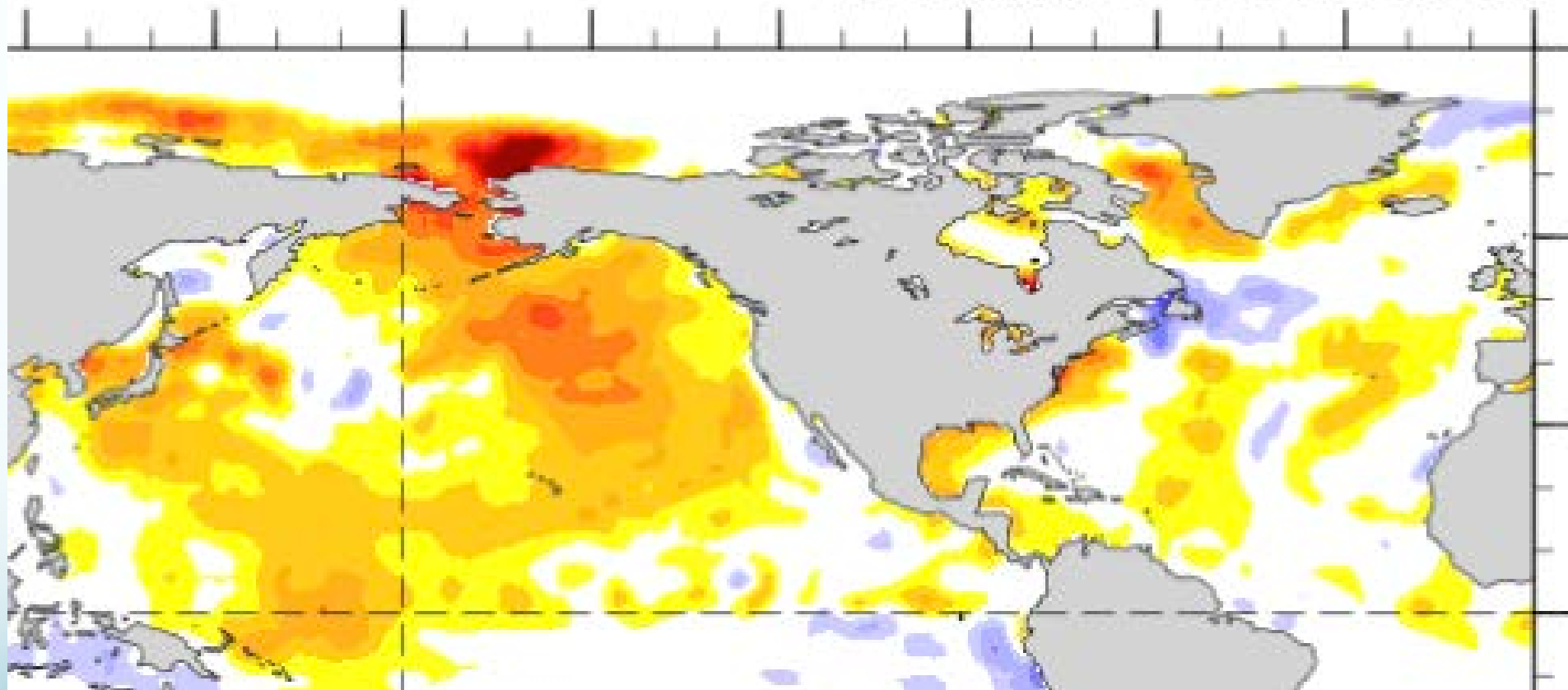
Richard Heim  
NCEI/NOAA



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

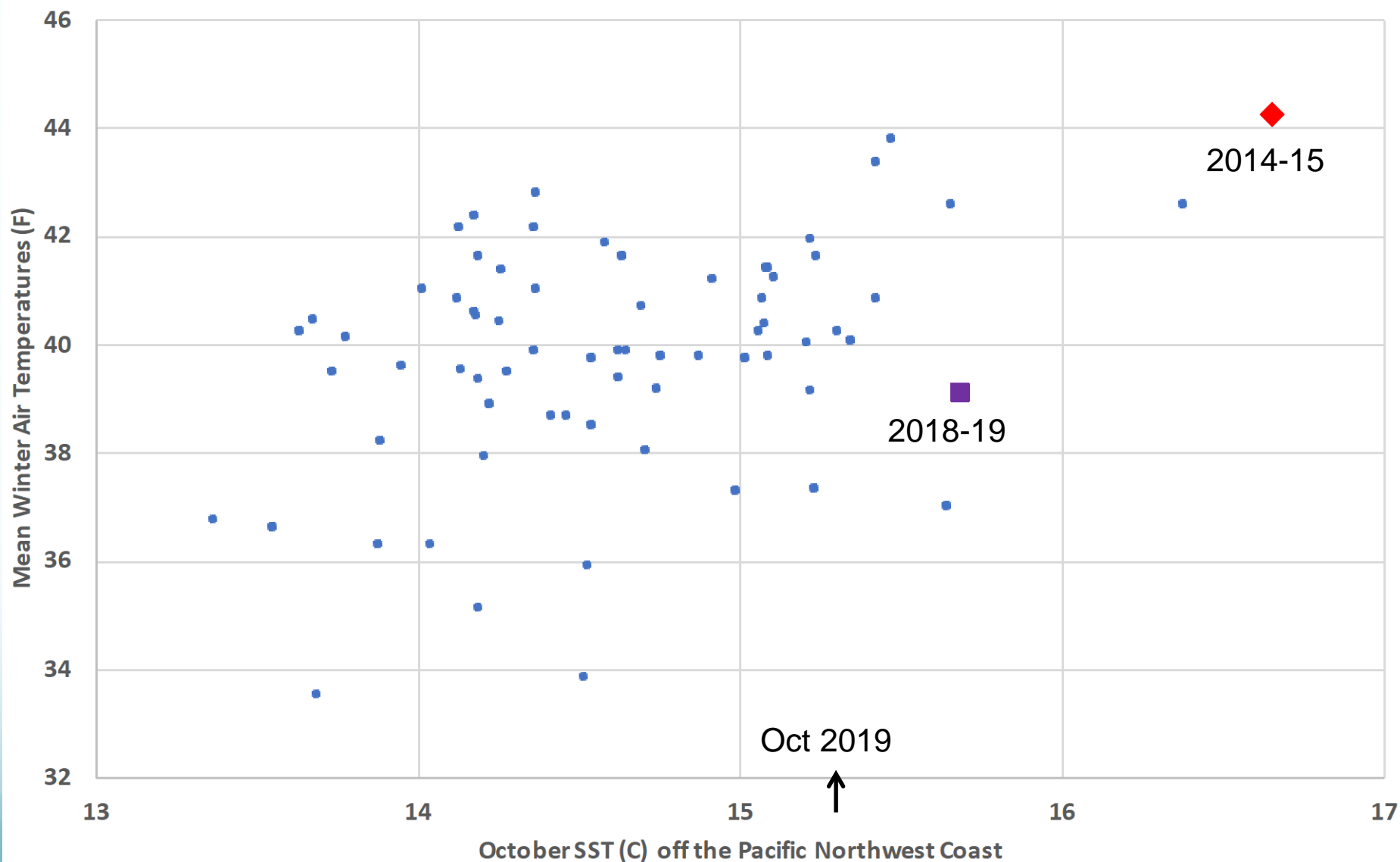
# Sea Surface Temperature Anomalies in Early October 2019

2019/09/29 - 2019/10/05





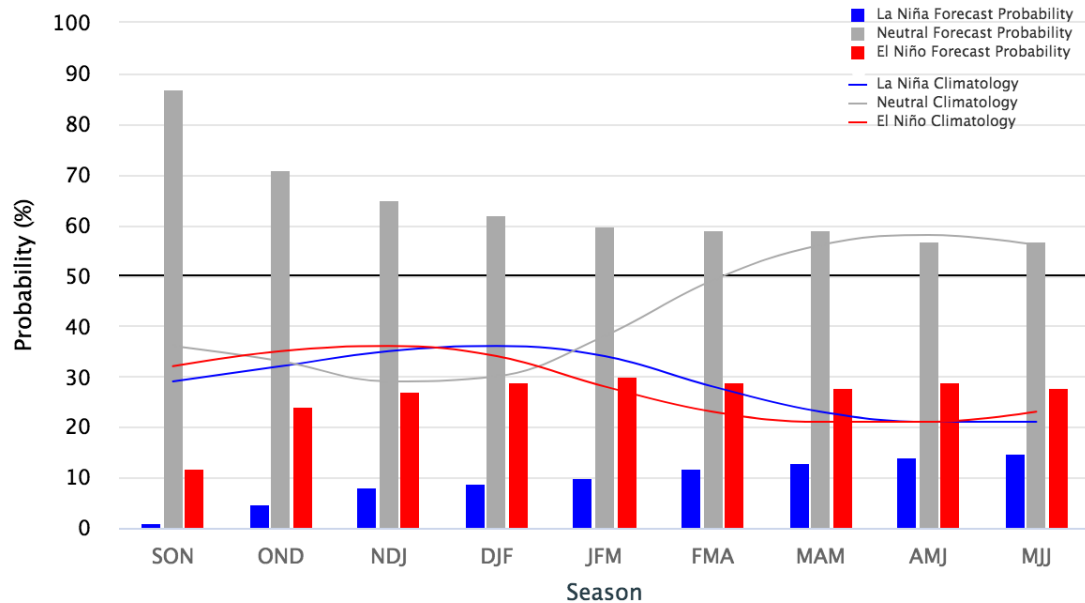
Puget Sound Winter (DJF) Mean Air Temperatures vs. Offshore SST in October



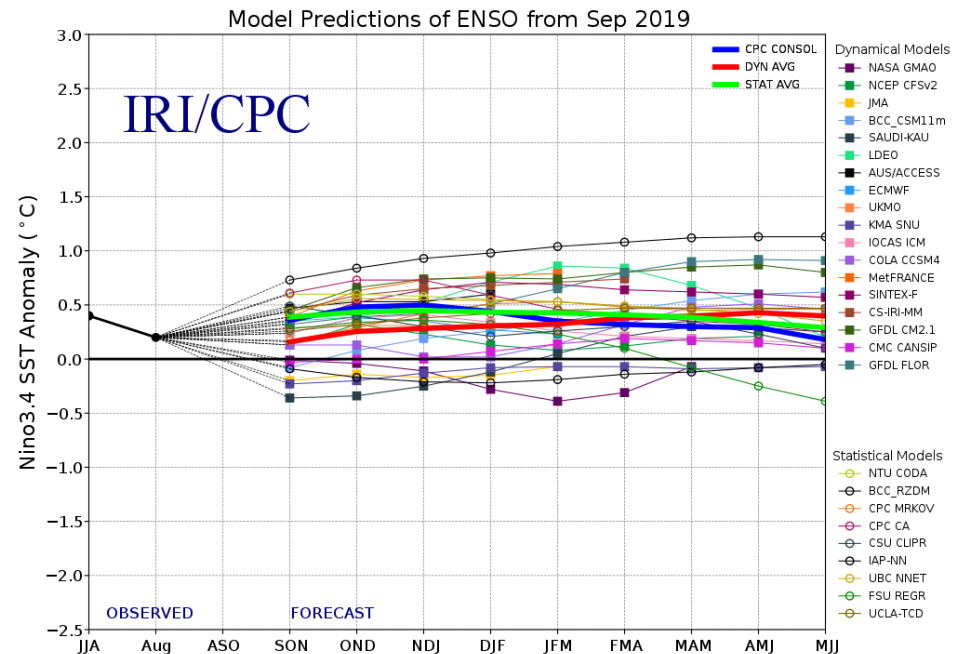
## Early–October 2019 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly

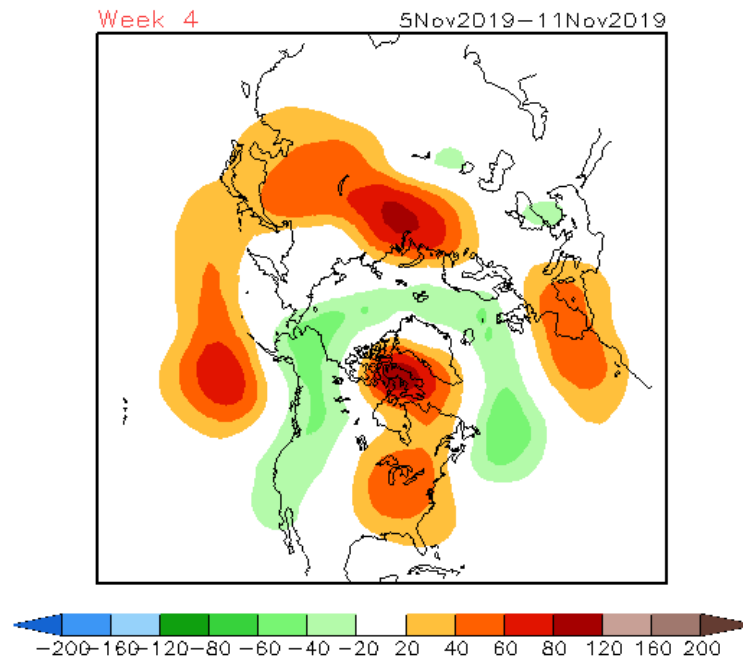
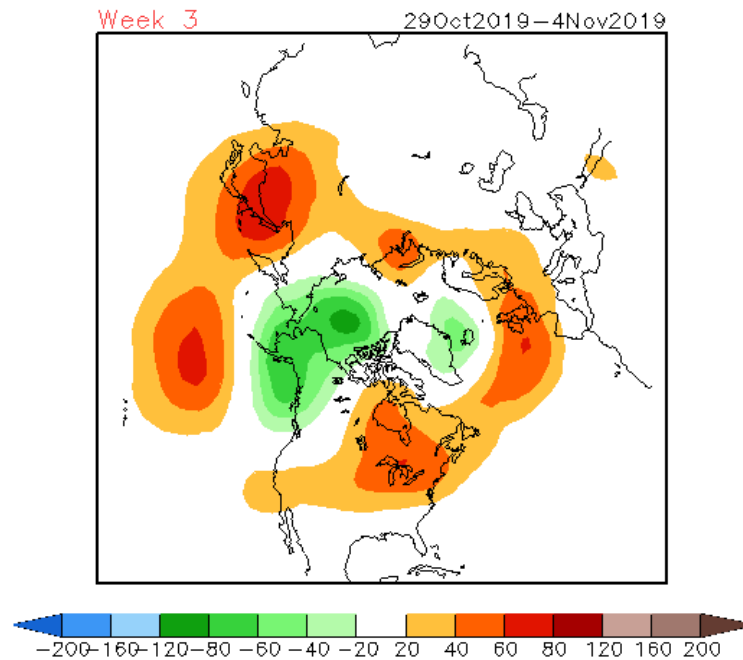
Neutral ENSO:  $-0.5^{\circ}\text{C}$  to  $0.5^{\circ}\text{C}$



# El Nino/La Nina Forecasts Indicate Elevated Odds of Near-Neutral Conditions



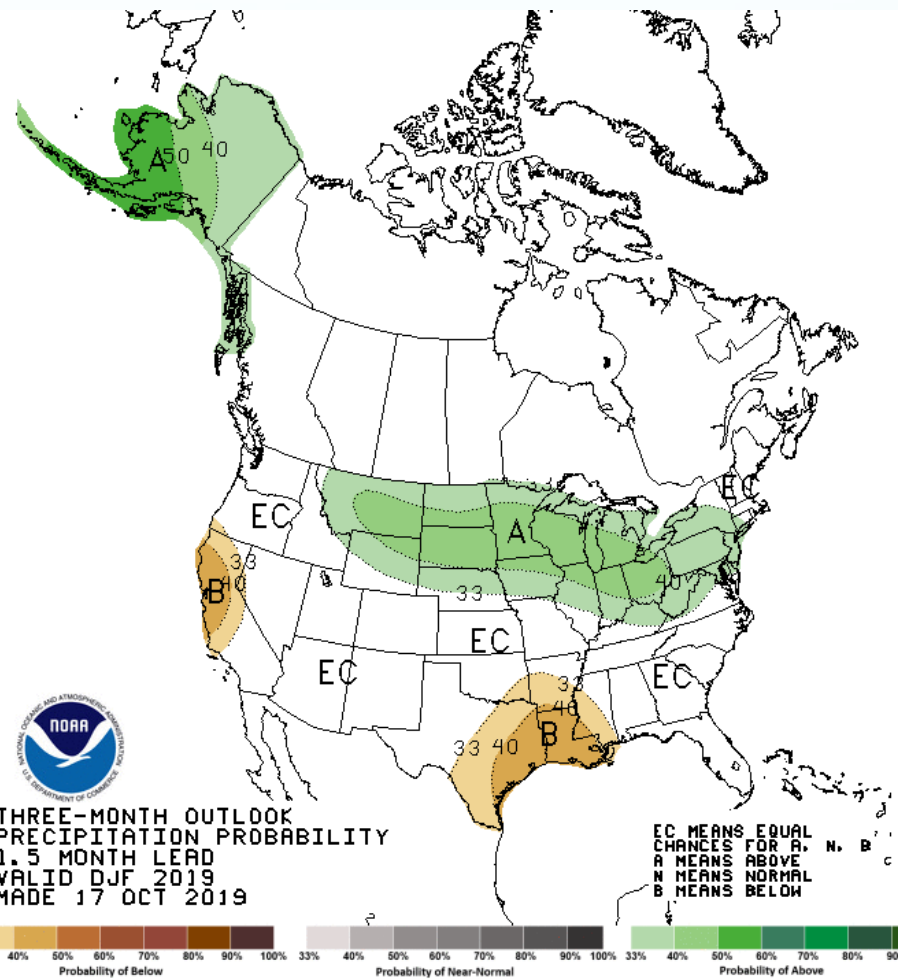
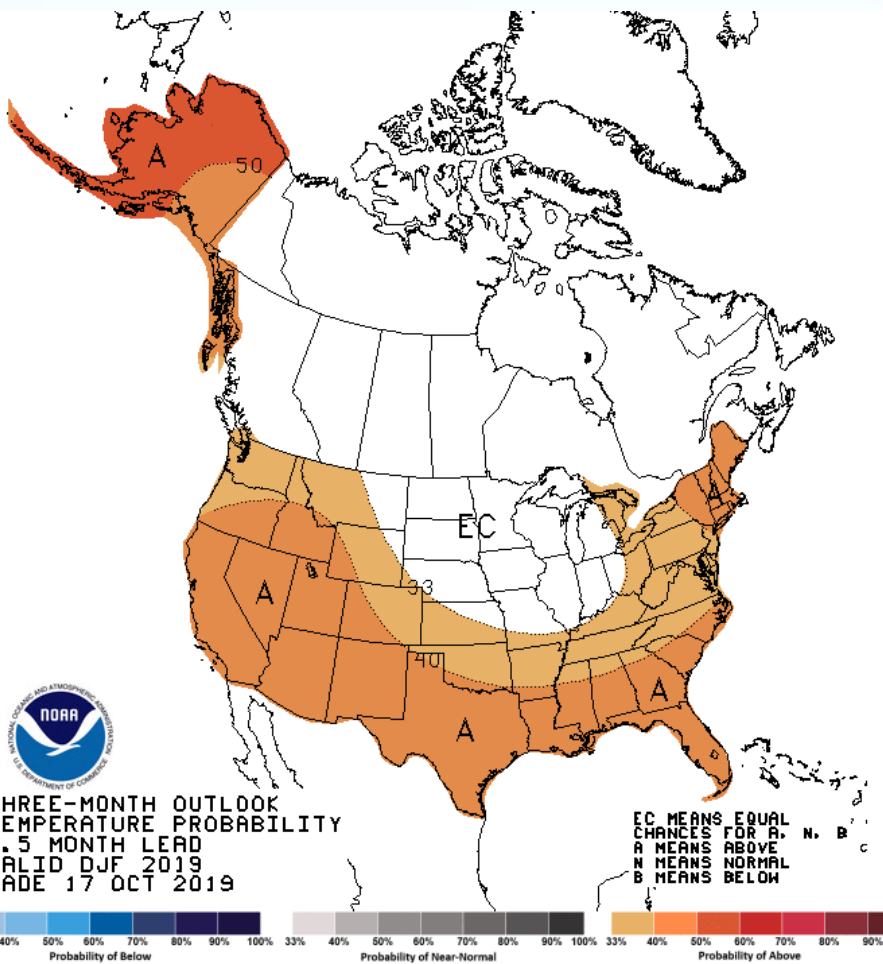




## Latest Set of Week 3-4 Forecasts from CFSv2

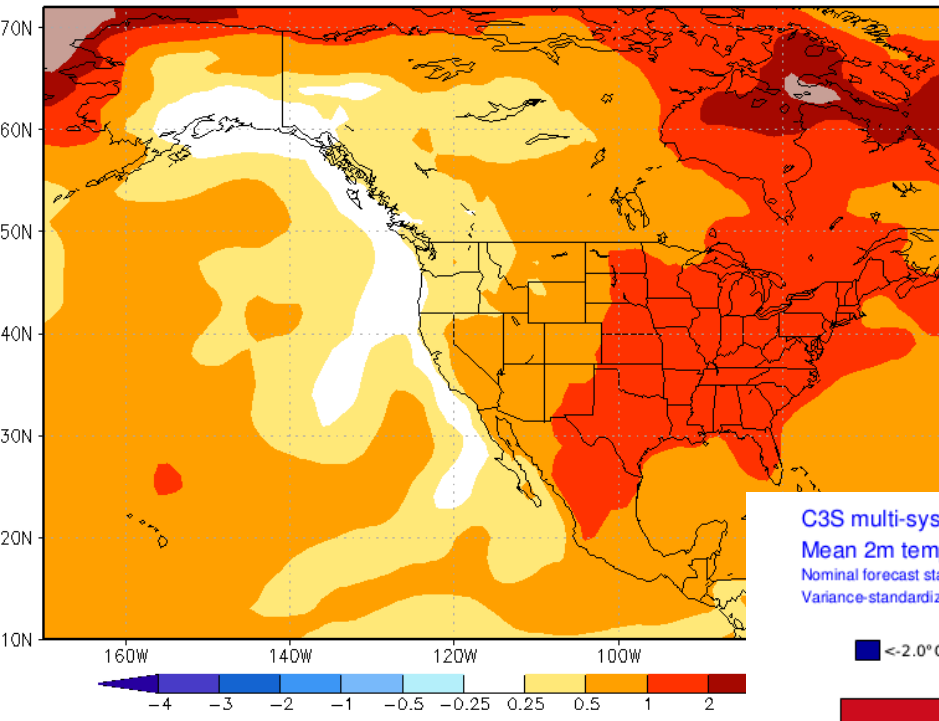
Anomalous low 500 hPa Z  
over AK extending south  
into Gulf of Alaska early  
and western North America  
late: For WA state, slightly  
warm early and cool late  
and on the wet side.

# NOAA/CPC Forecasts for Dec-Feb



# Climate Model Ensemble Projections for JFM Temperature

NMME Forecast of TMP2m Anom IC=201910 for Lead 3 2020JFM



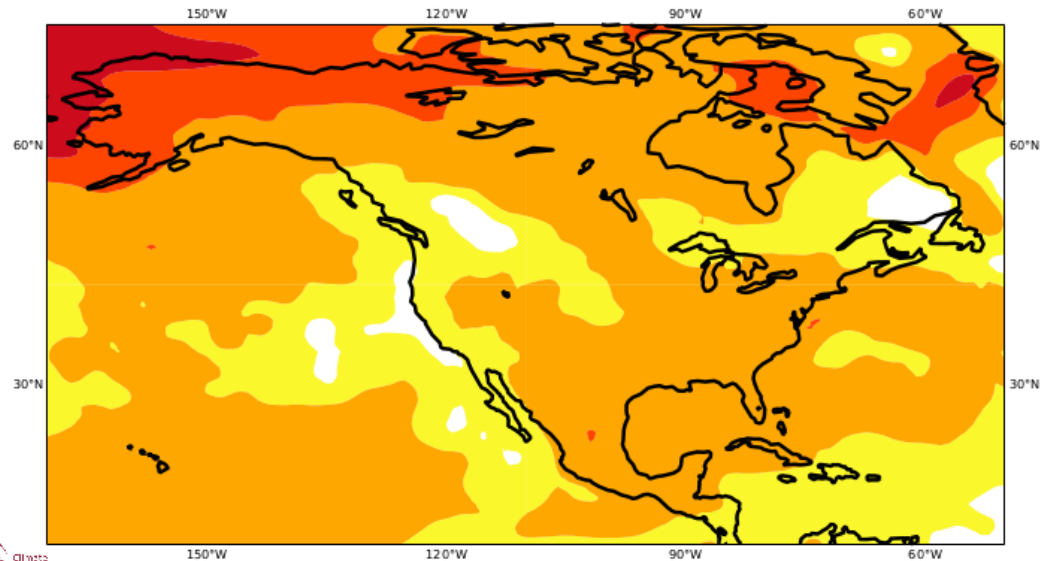
NMME

IMME

C3S multi-system seasonal forecast  
Mean 2m temperature anomaly  
Nominal forecast start: 01/10/19  
Variance-standardized mean

ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP  
JFM 2020

<-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

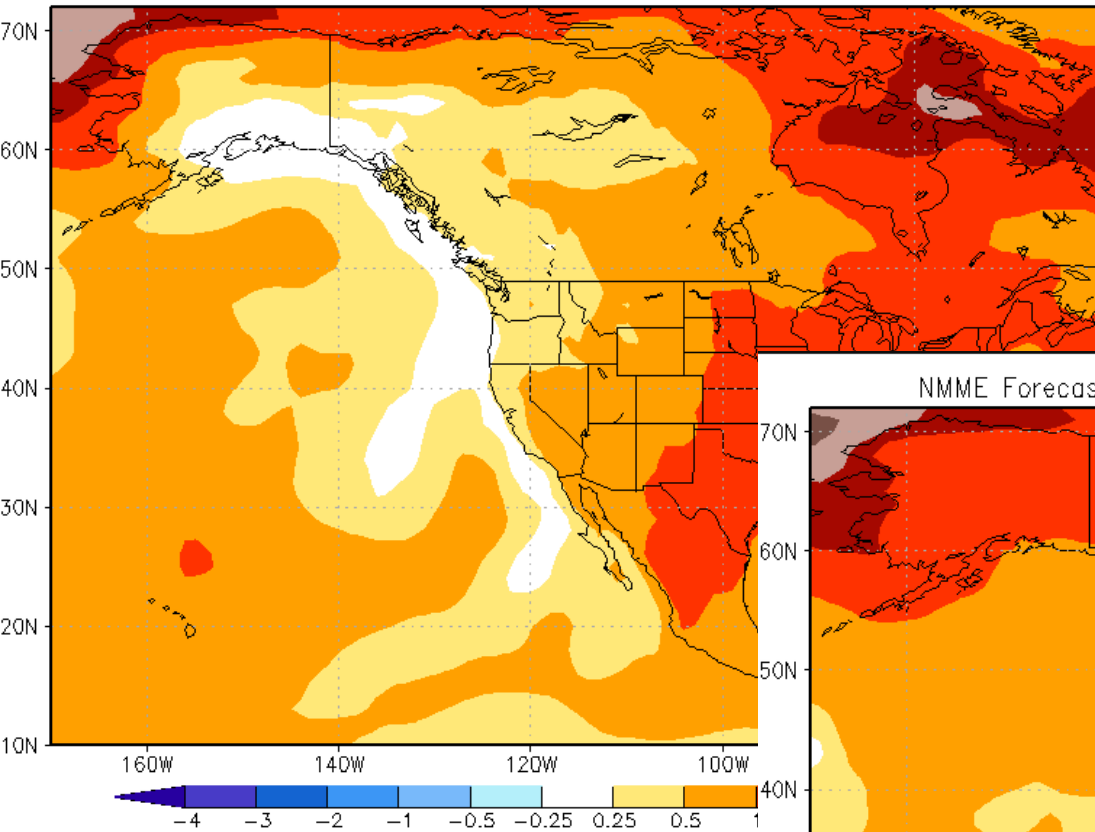


## October Model Runs

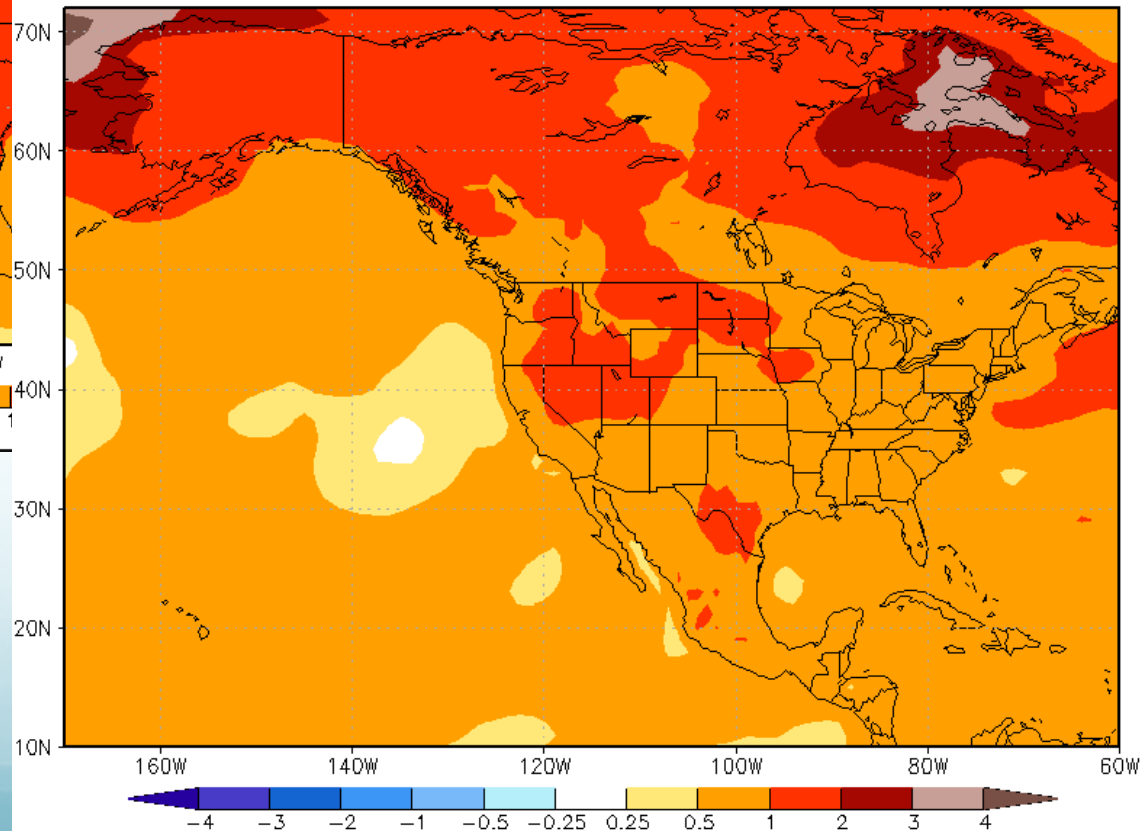
Latest Simulations  
Indicate Weaker  
Warm Anomalies  
for the PNW during  
Late Winter

## September Model Runs

NMME Forecast of TMP2m Anom IC=201910 for Lead 3 2020JFM



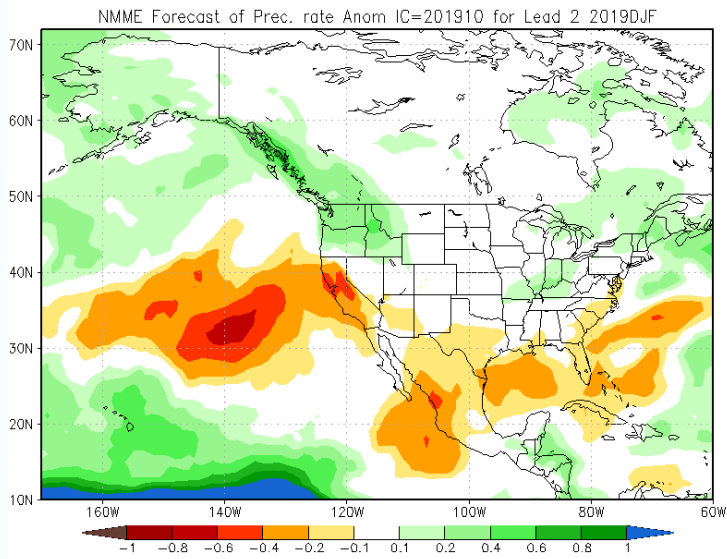
NMME Forecast of TMP2m Anom IC=201909 for Lead 4 2020JFM



More recent runs also  
indicate wetter weather  
in late winter, but models  
have shown a great deal  
of inconsistency here



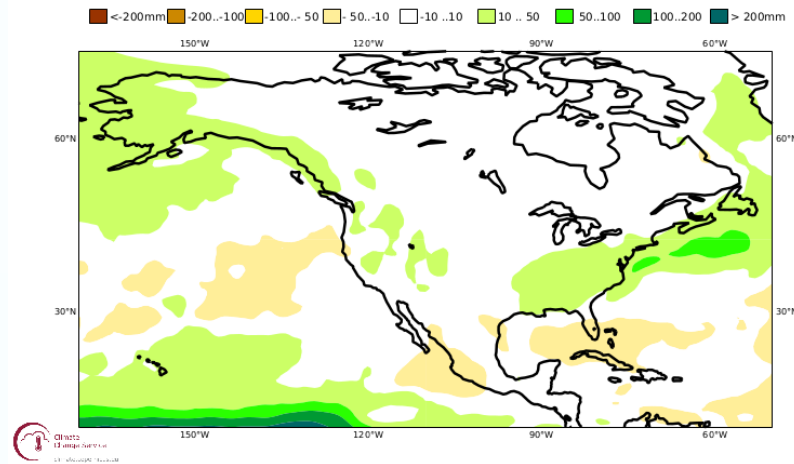
# Variation among Models: Precipitation



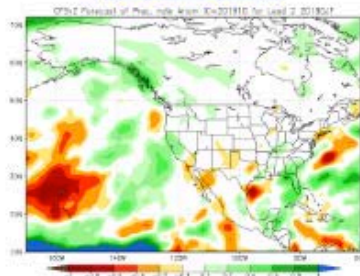
C3S multi-system seasonal forecast  
Mean precipitation anomaly  
Nominal forecast start: 01/10/19  
Variance-standardized mean

IMME

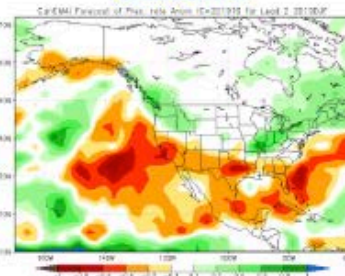
ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP  
DJF 2019/20



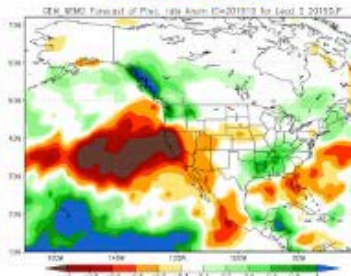
**NCEP CFSv2**



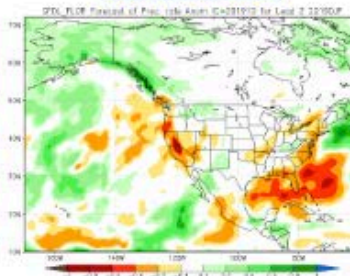
**CanCM4i**



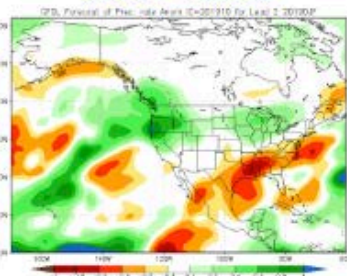
**GEM NEMO**



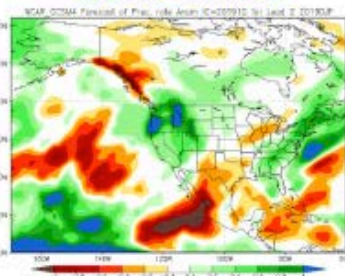
**GFDL FLOR**



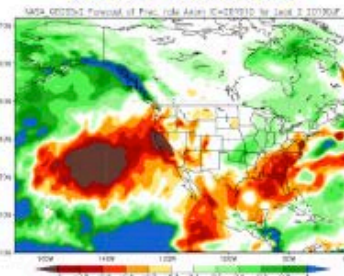
**GFDL CM2.1**



**NCAR CCSM4**



**NASA GEOS5v2**



**IMME**

**IMME**



# Final Remarks

- Water year 2019 featured near-normal temperatures and below normal precipitation, on average
- September above normal precipitation and near-normal temps helped improve streamflows and thus improve the U.S. Drought Monitor depiction
- ENSO not liable to be a significant player in the climate system during the upcoming fall and winter.
- Expecting temperatures in the near-normal to moderately above normal due to multi-year trends and climate model output; considerable uncertainty with respect to precipitation but may be wetter than usual.