

Regional Climate Perspective

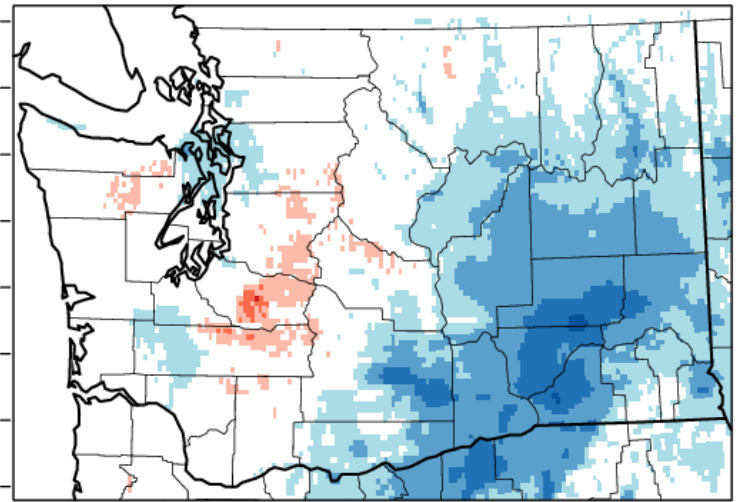
Nick Bond & Karin Bumbaco
Office of the Washington State Climatologist
Joint Institute for the Study of Atmosphere and Ocean
University of Washington
12 April 2019

2019 Water Year

Temperature

Washington - Mean Temperature

October-March 2019 Departure from 1981-2010 Normal

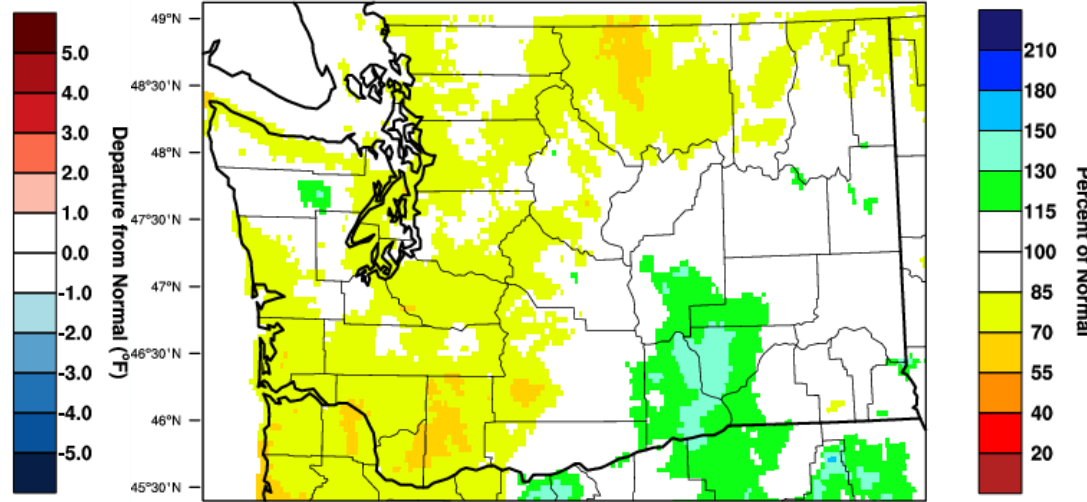


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 7 APR 2019

Precipitation

Washington - Precipitation

October-March 2019 Percent of 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 7 APR 2019

WWDT

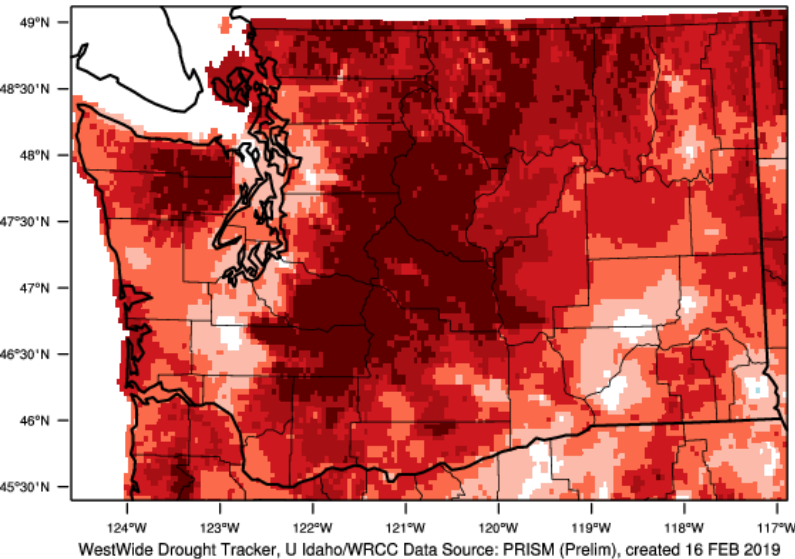
- Average Oct-Mar temperatures statewide near-normal (-0.8°F below normal)
- Below normal Oct-Mar precipitation averaged statewide (-5.41" below normal)

Tale of Two Winters

October-January

Washington - Mean Temperature

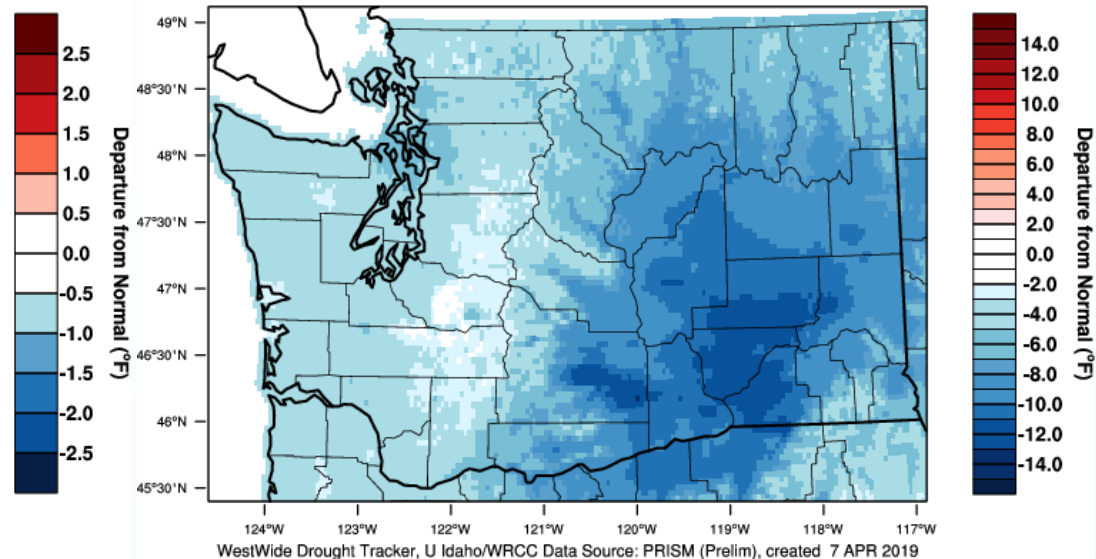
October-January 2019 Departure from 1981-2010 Normal



February-March

Washington - Mean Temperature

February-March 2019 Departure from 1981-2010 Normal



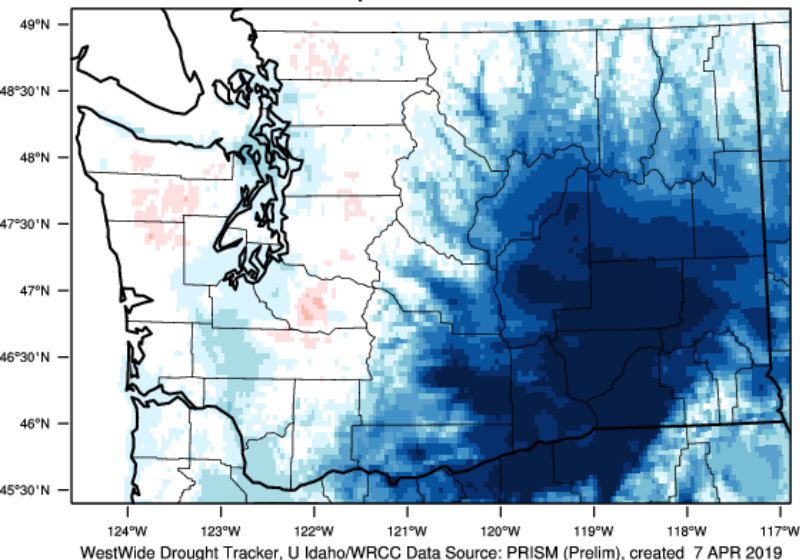
- Statewide: Oct-Jan tied as 12th warmest; Feb-Mar tied as 5th coldest (coldest since 1956)
- Magnitude of the Feb-Mar cold anomalies greater than the Oct-Jan warm anomalies

March 2019

Temperature

Washington - Mean Temperature

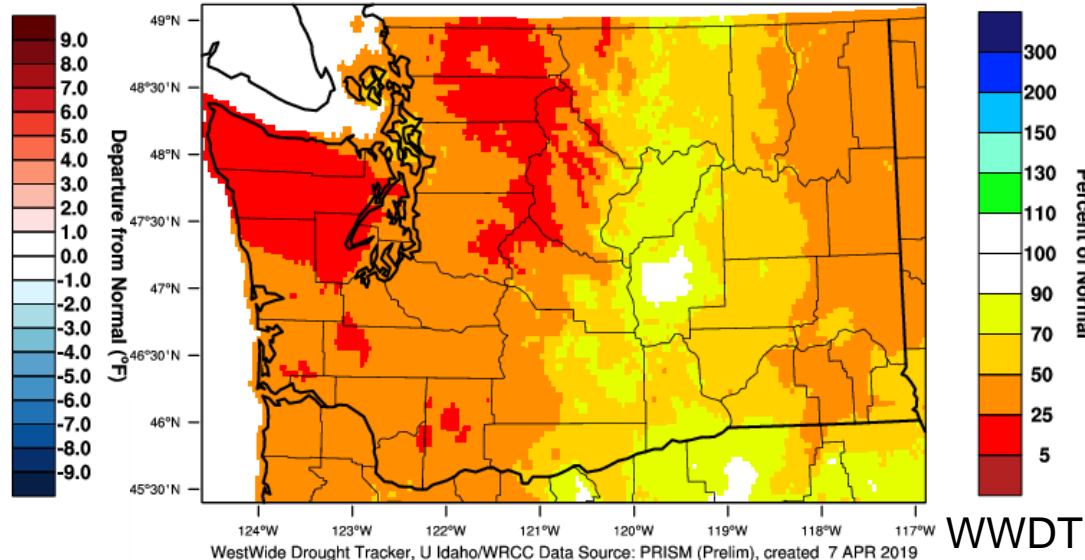
March 2019 Departure from 1981-2010 Normal



Precipitation

Washington - Precipitation

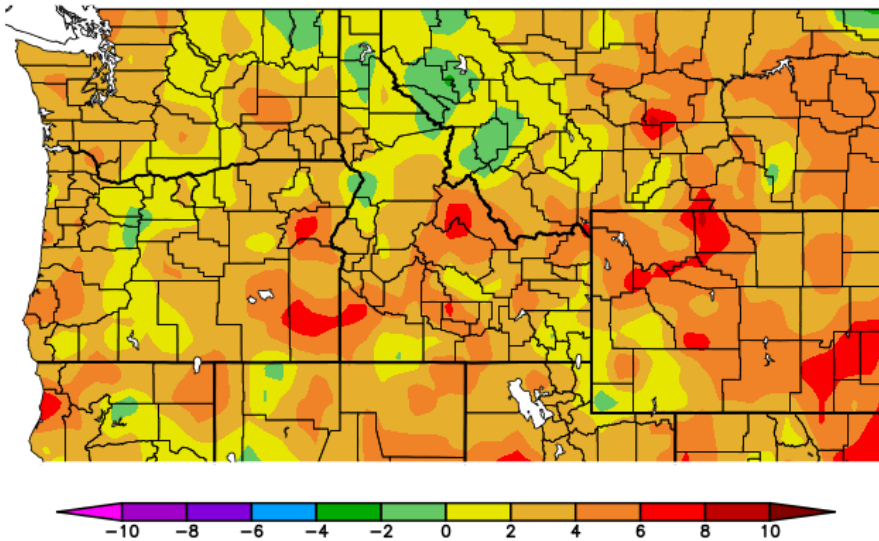
March 2019 Percent of 1981-2010 Normal



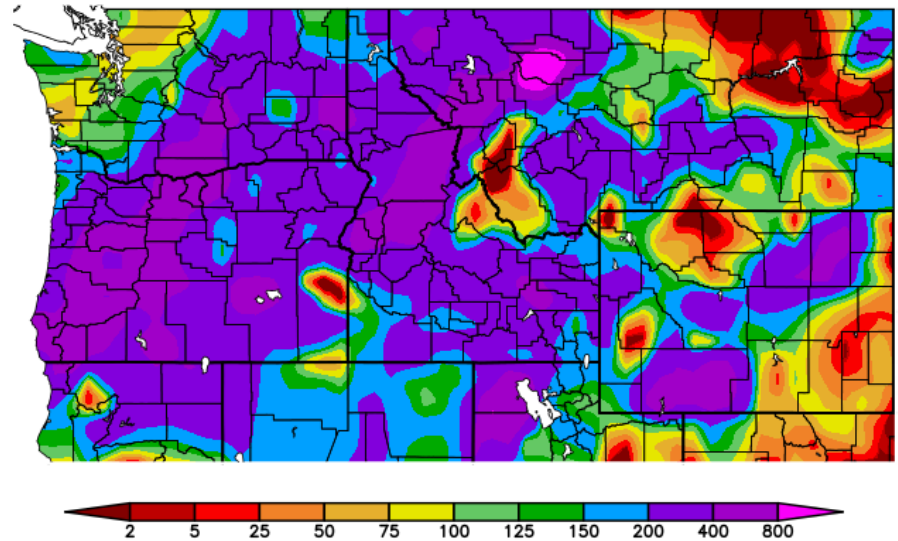
- Statewide, average March temperatures were -3.2°F below normal
- Statewide, 4th driest March on record (since 1895) with -2.96" below normal
 - March 1965, 1992 and 1996 were drier

April so far...

Departure from Normal Temperature (F)
4/1/2019 - 4/10/2019



Percent of Normal Precipitation (%)
4/1/2019 - 4/10/2019



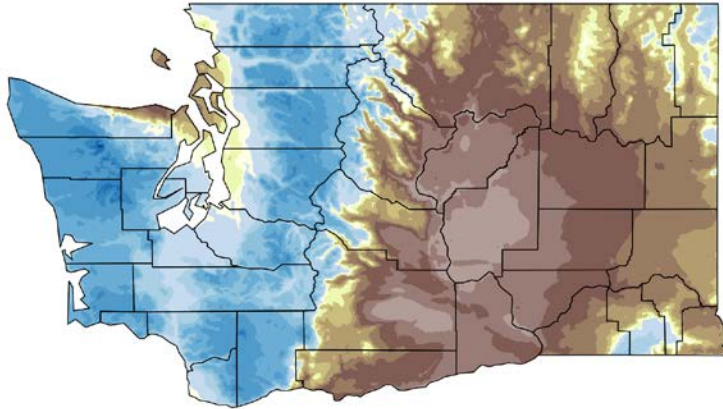
Generated 4/11/2019 at HPRCC using provisional data.

NOAA Regional Climate Center Generated 4/11/2019 at HPRCC using provisional data.

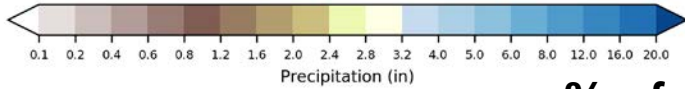
NOAA Regional Climate Centers

Average April Precipitation
Washington

climatology



Map created November 2018 at WRCC using
PRISM 800m 30-year normals (1981-2010)
(prism.oregonstate.edu)



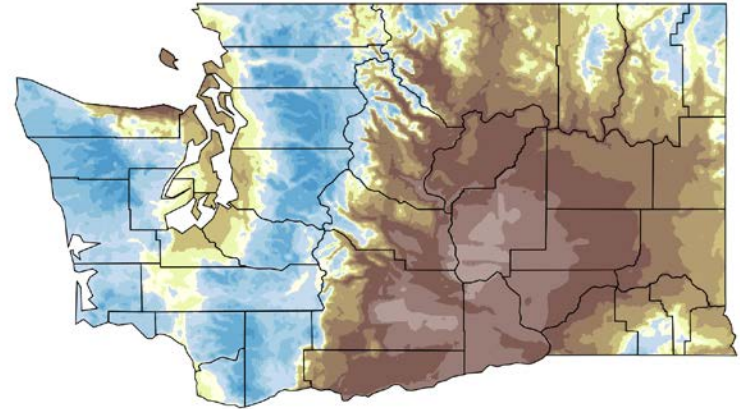
Precipitation (in)

April

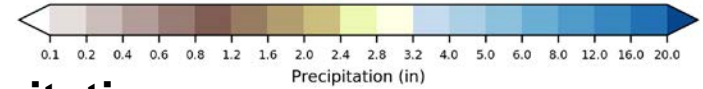
% of Annual Precipitation

Average May Precipitation
Washington

climatology

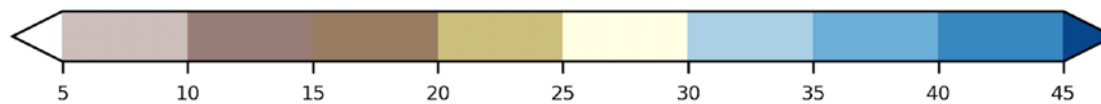
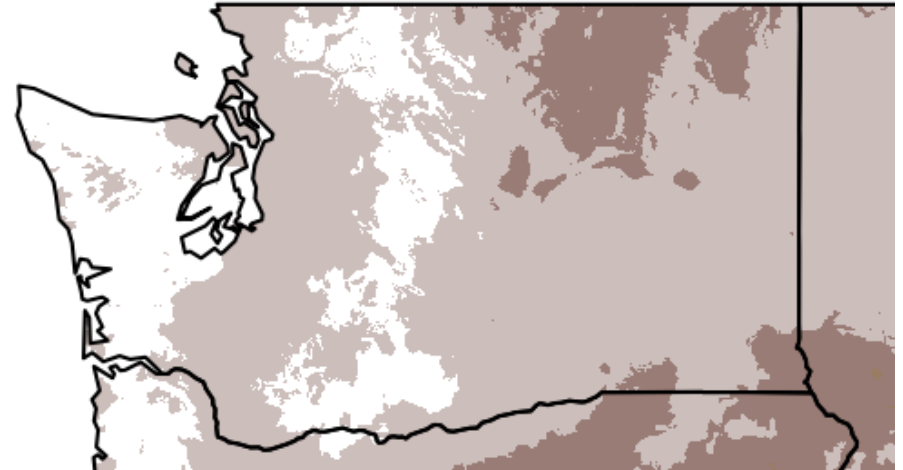


Map created November 2018 at WRCC using
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Precipitation (in)

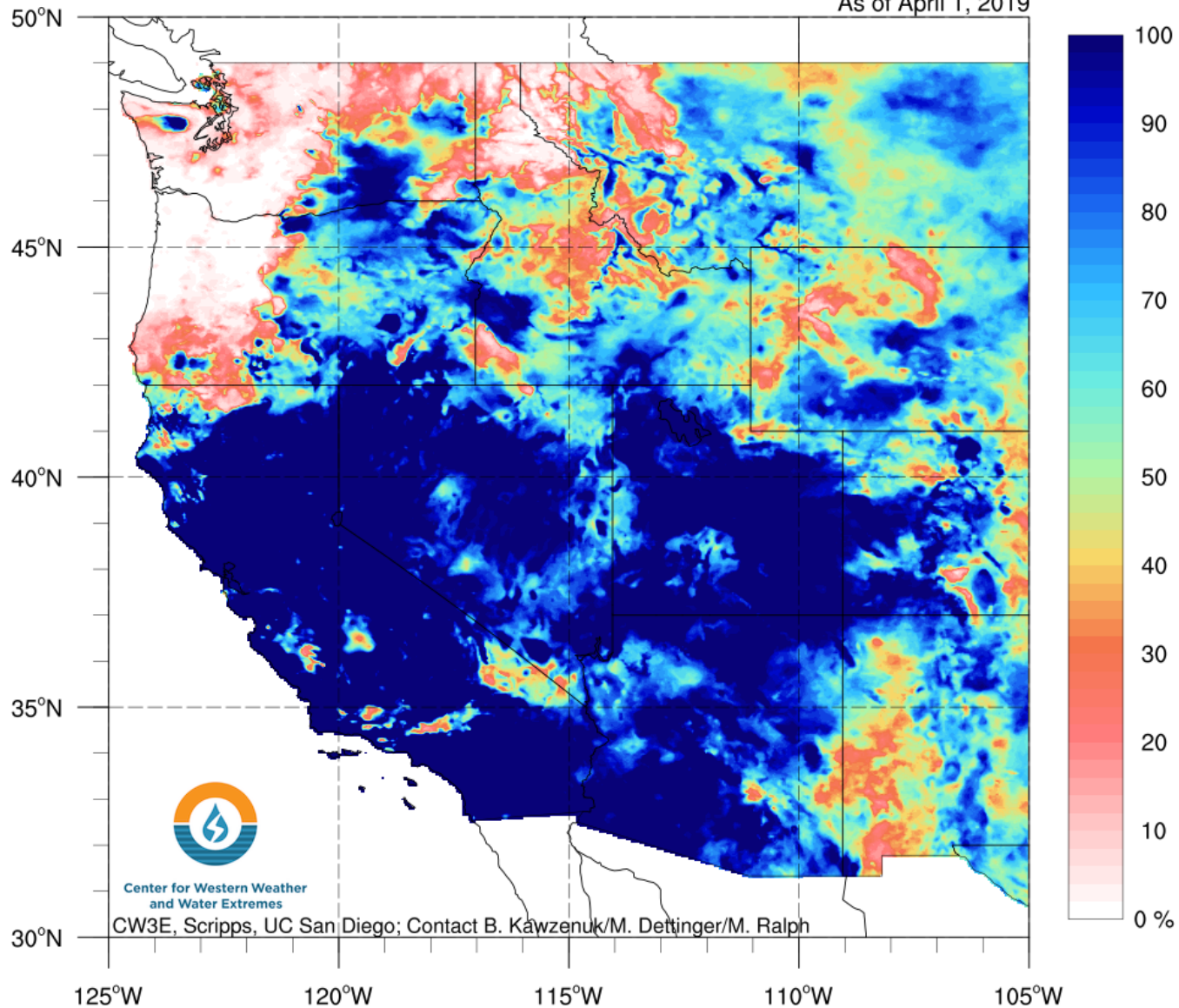
May



Percent

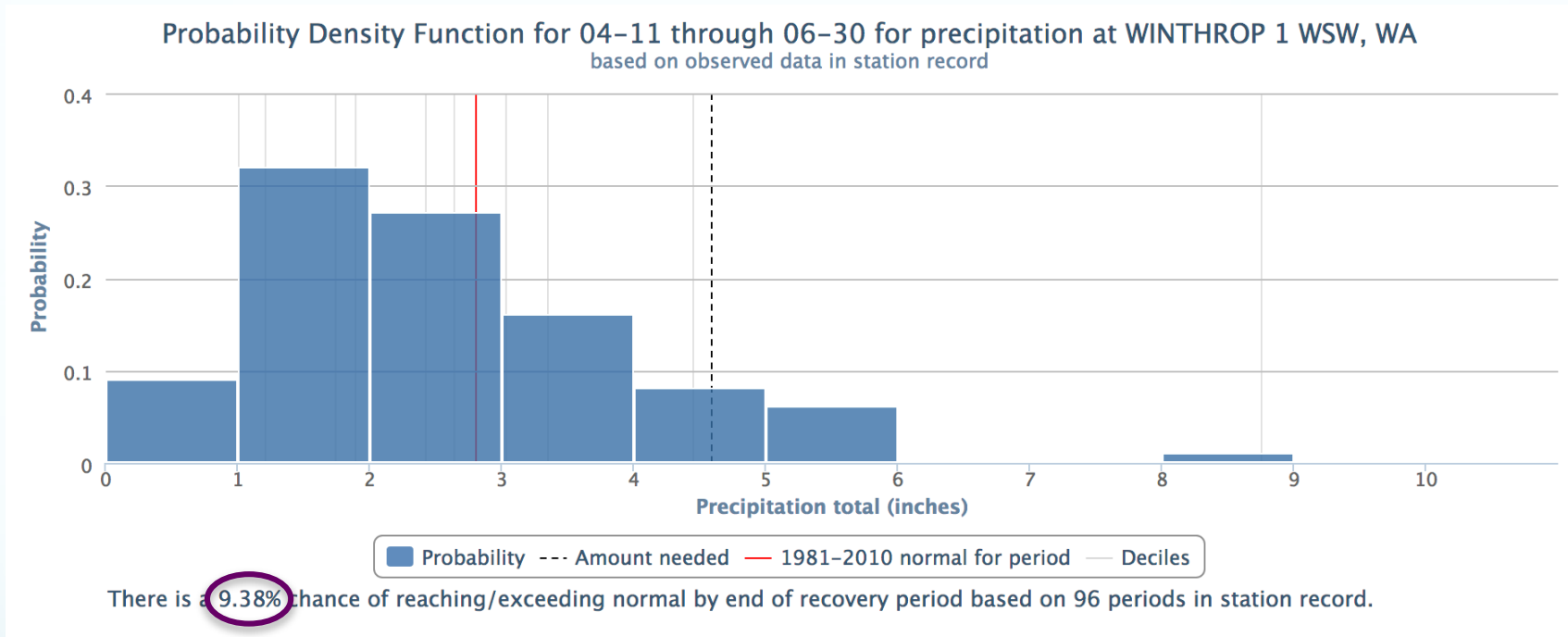
Odds of Water Year 2019 Reaching 100% of Water Year Normal Precipitation

As of April 1, 2019



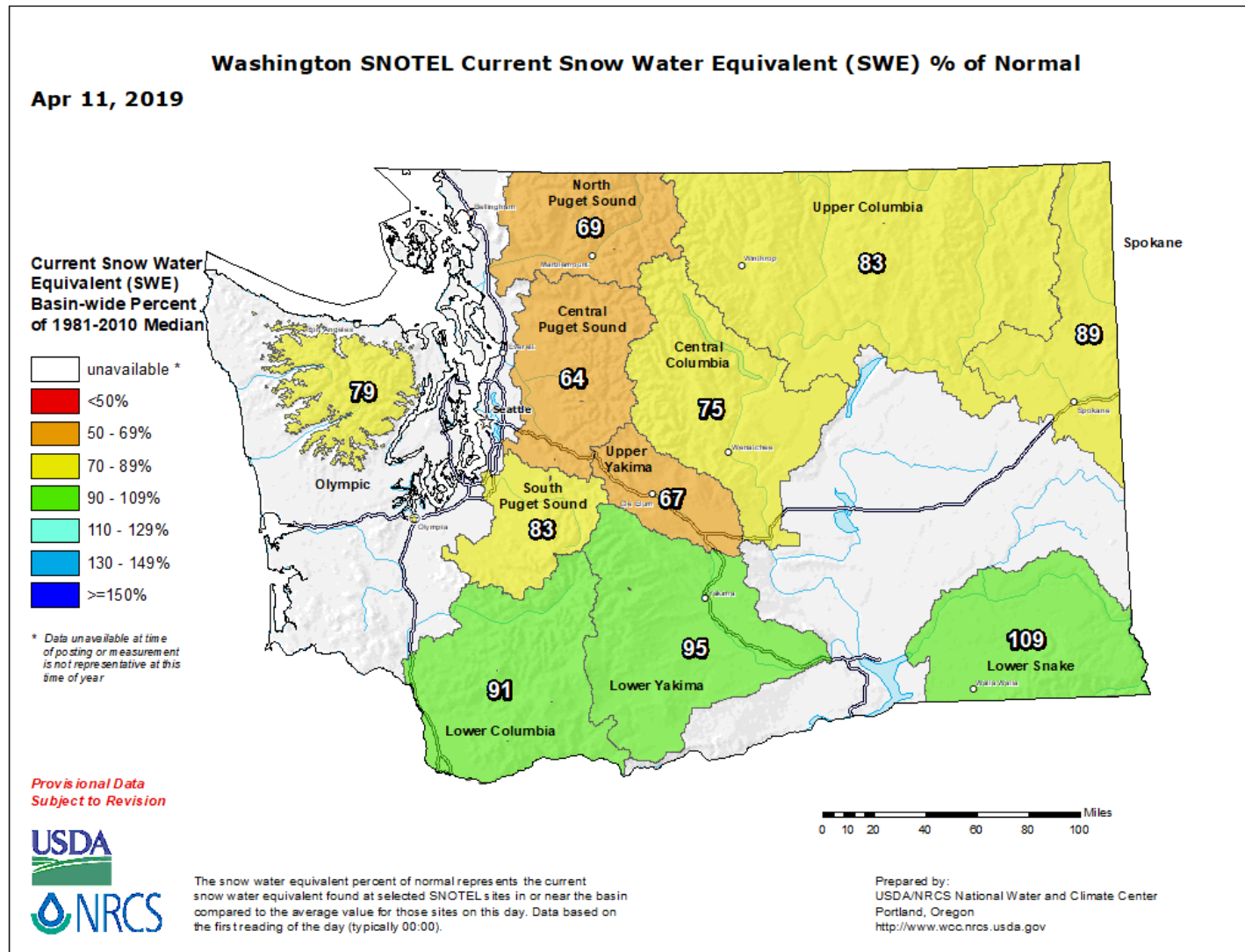
Data courtesy: PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>

Probability of Recovery



- Winthrop ~1.75" below normal for the water year

April 11 SWE



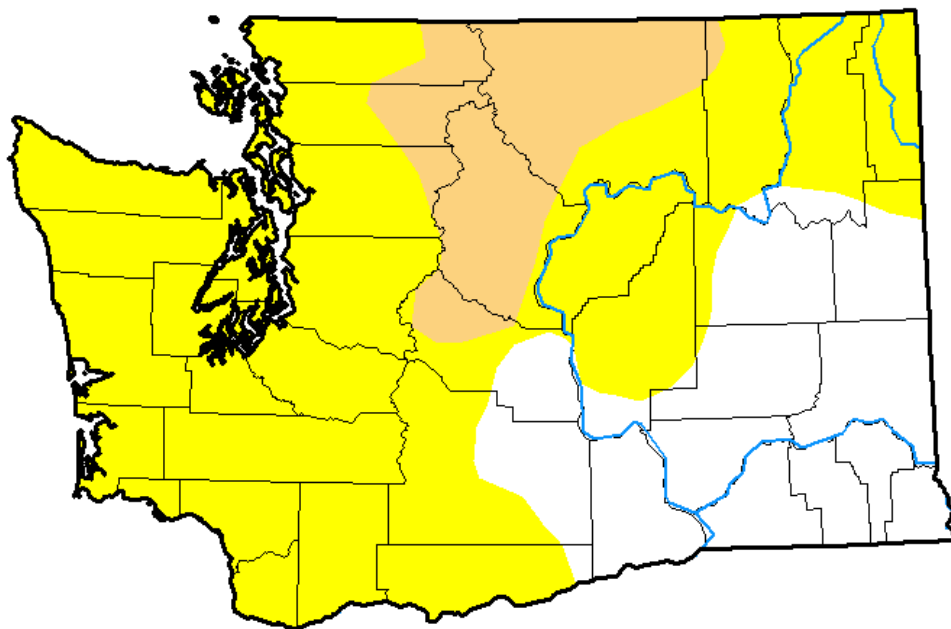
US Drought Monitor

U.S. Drought Monitor Washington

April 9, 2019

(Released Thursday, Apr. 11, 2019)

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

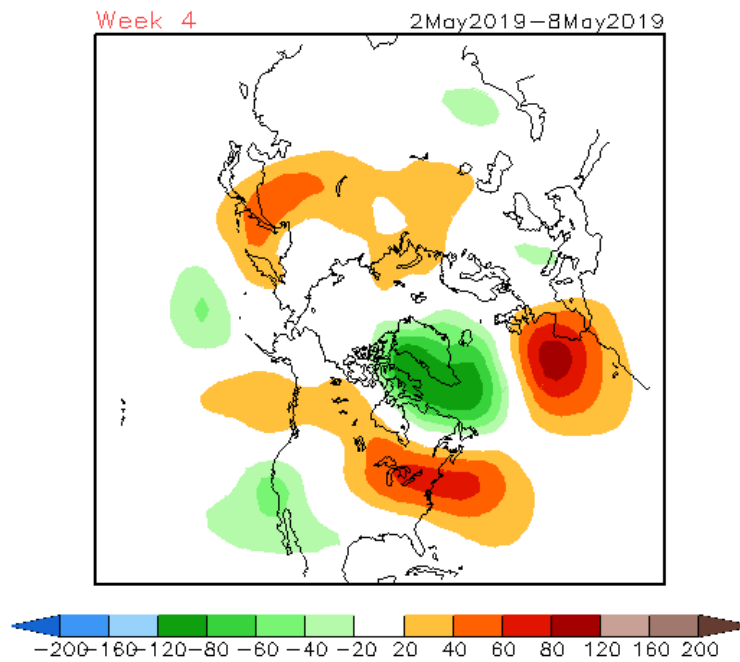
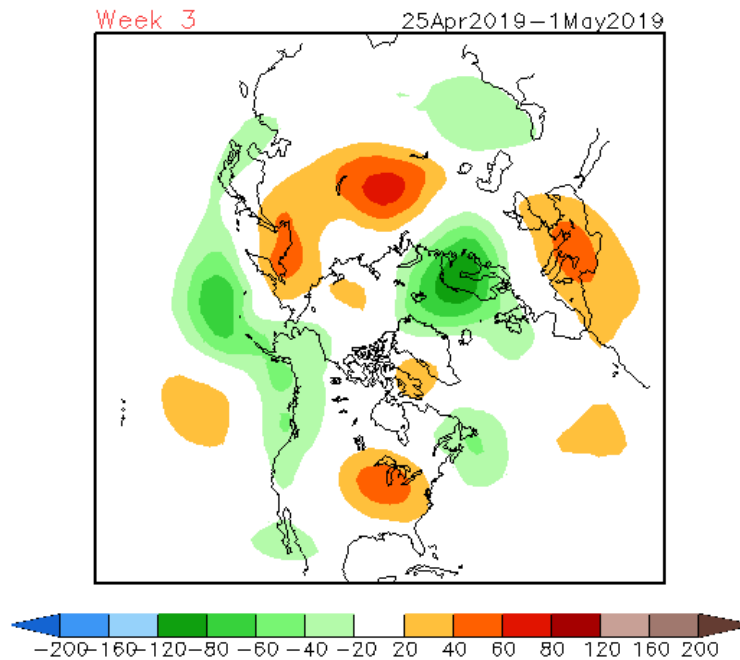
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Deborah Bathke
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

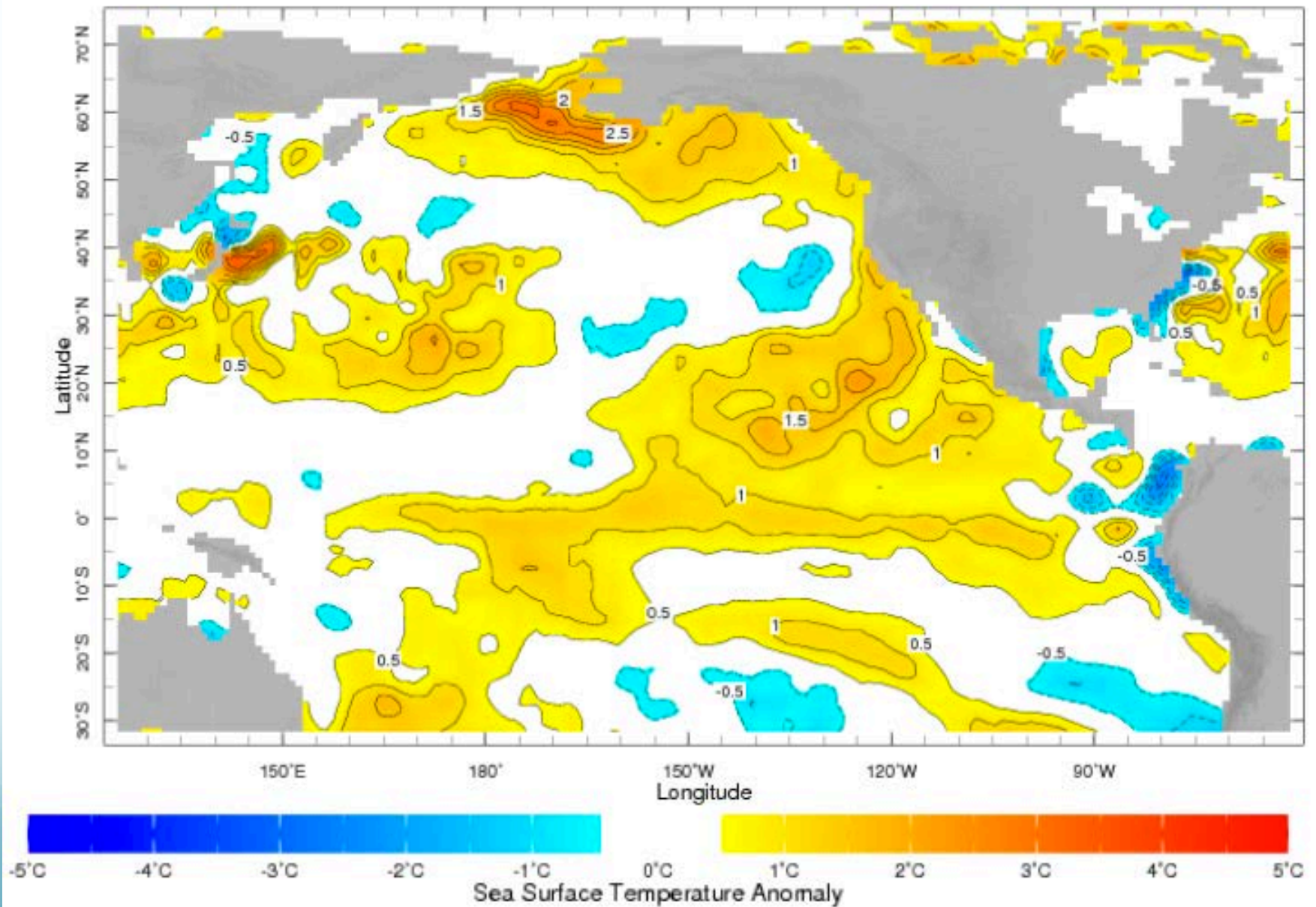


Latest Set of Week 3-4 Forecasts from CFSv2

Anomalous low
500 hPa Z along the coast
of the Pac NW early
and high Z to the north late:
For WA state mostly cooler
and wetter than normal
early and dry and warm
late

Recent Pacific SST Anomalies

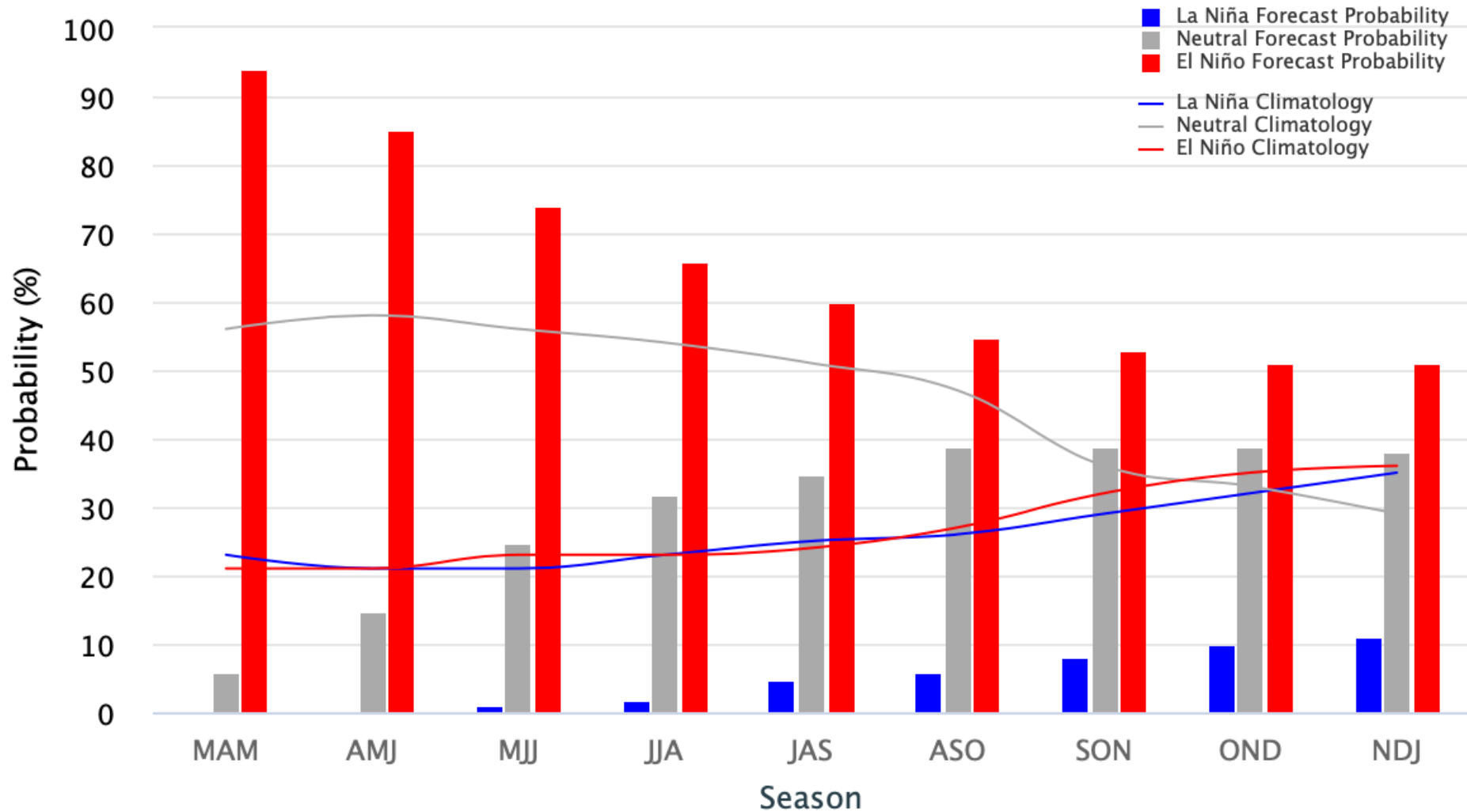
3 Apr 2019



Early-April 2019 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly

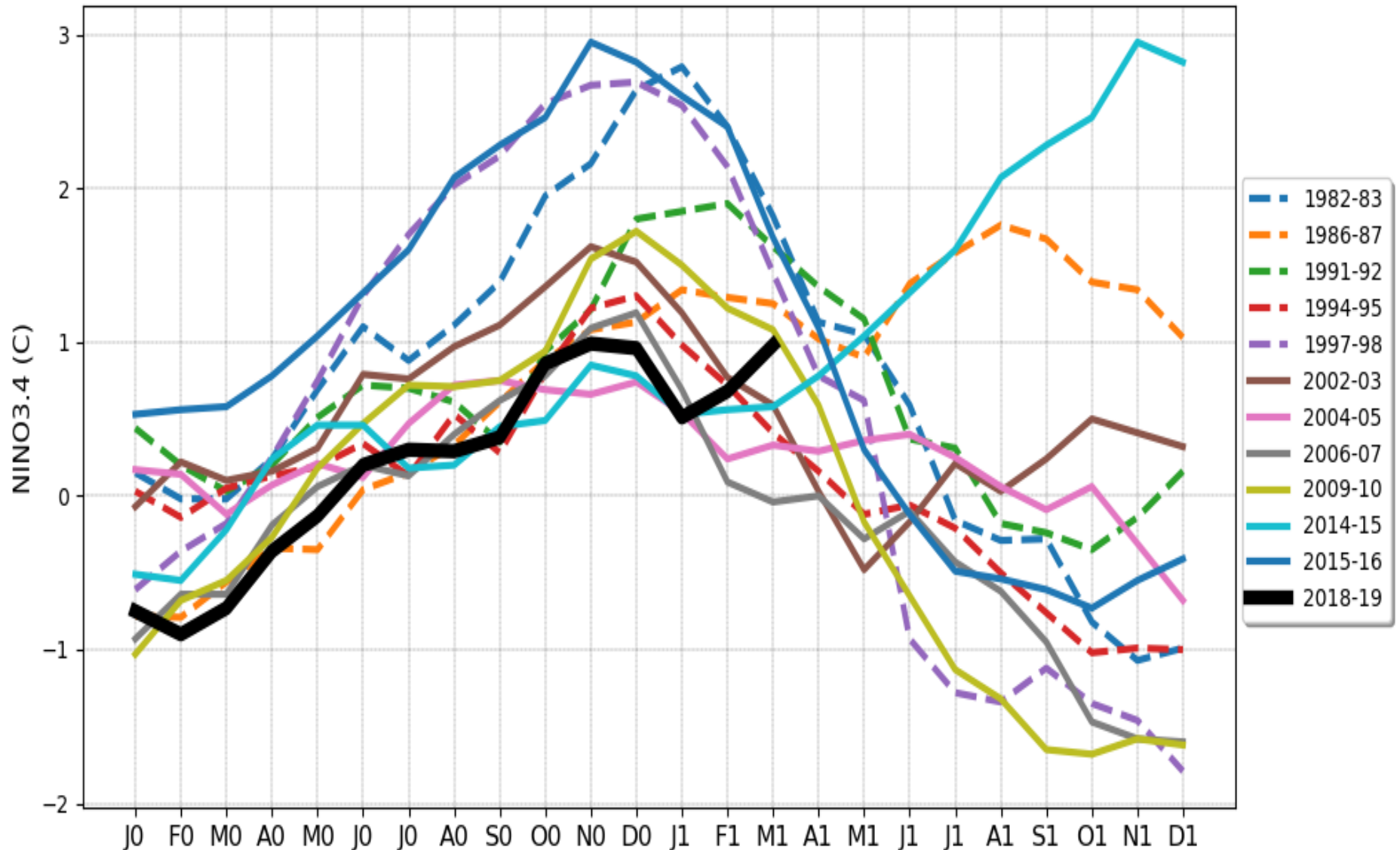
Neutral ENSO: -0.5°C to 0.5°C



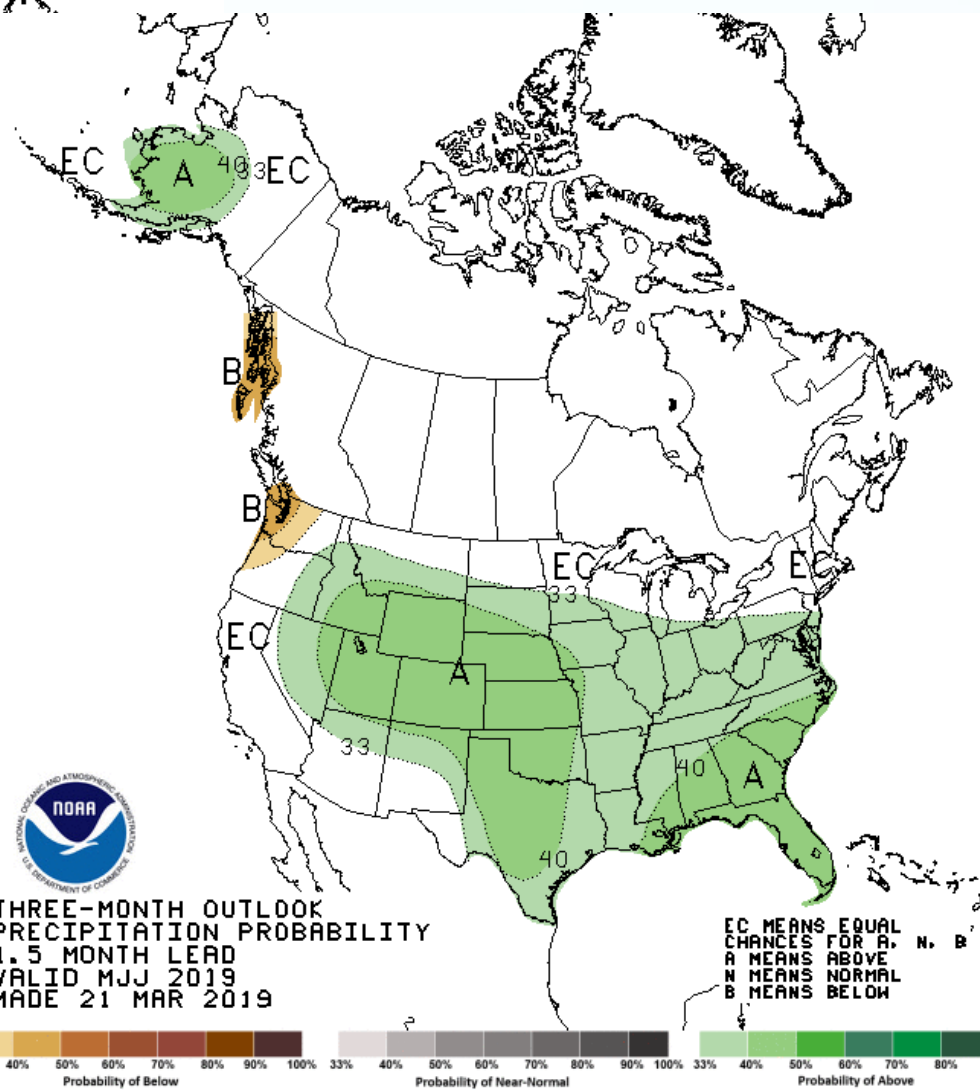
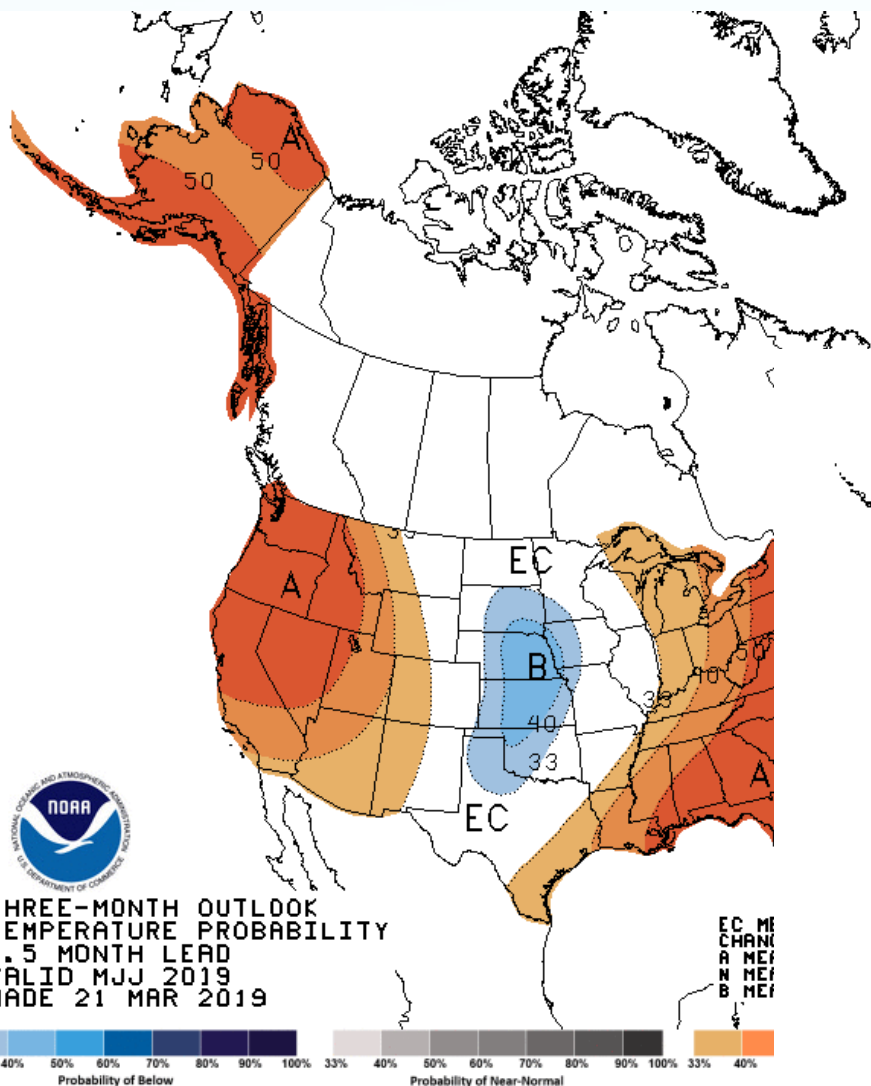
Nino3.4 Evolution In El Nino Years

Provided by Yan Xue

NINO3.4: El Nino Years

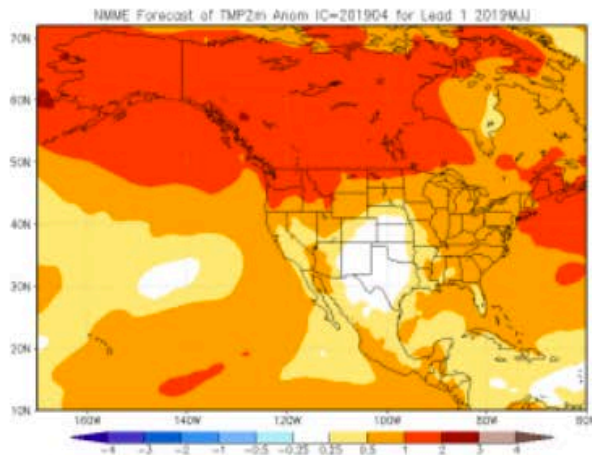


NOAA/CPC Forecasts

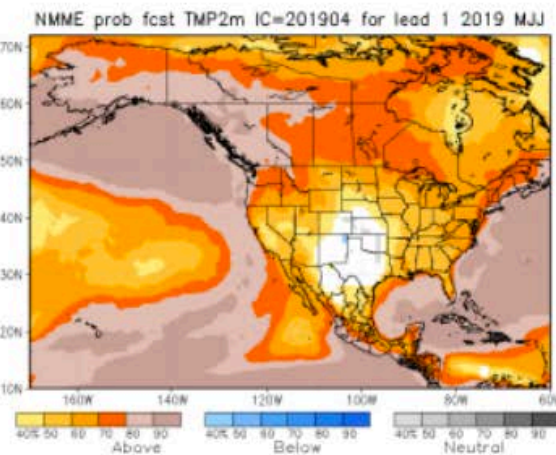


Climate Model Projections for MJJ 2019 Temperature

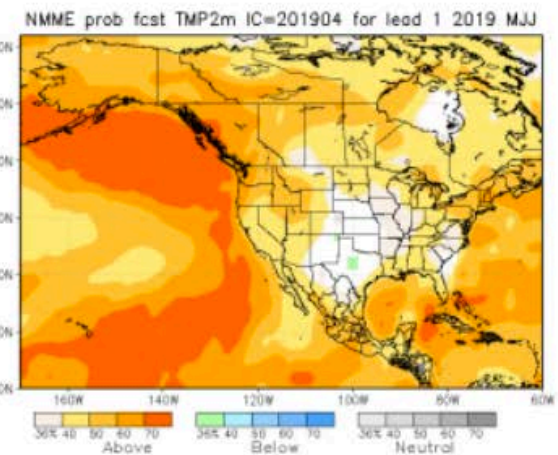
NMME



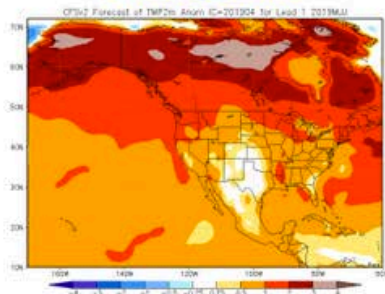
Prob fcst



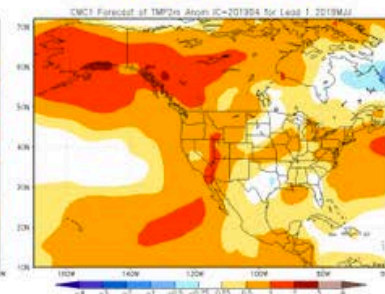
PAC calib. prob fcst



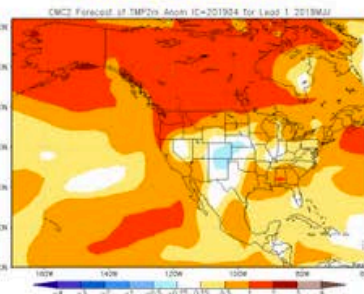
NCEP CFSv2



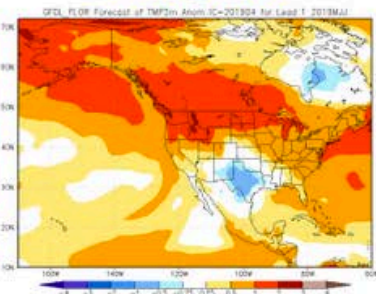
CMC1 CanCM3



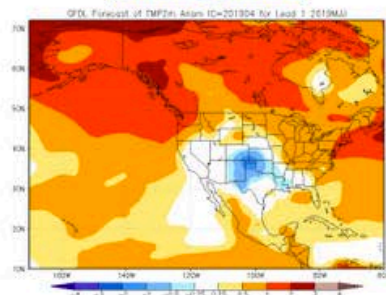
CMC2 CanCM4



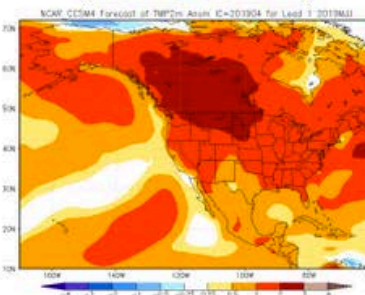
GFDL FLOR



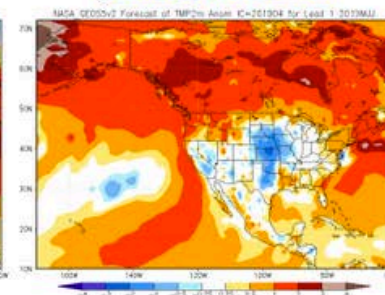
GFDL CM2.1



NCAR CCSM4



NASA GEOS5v2

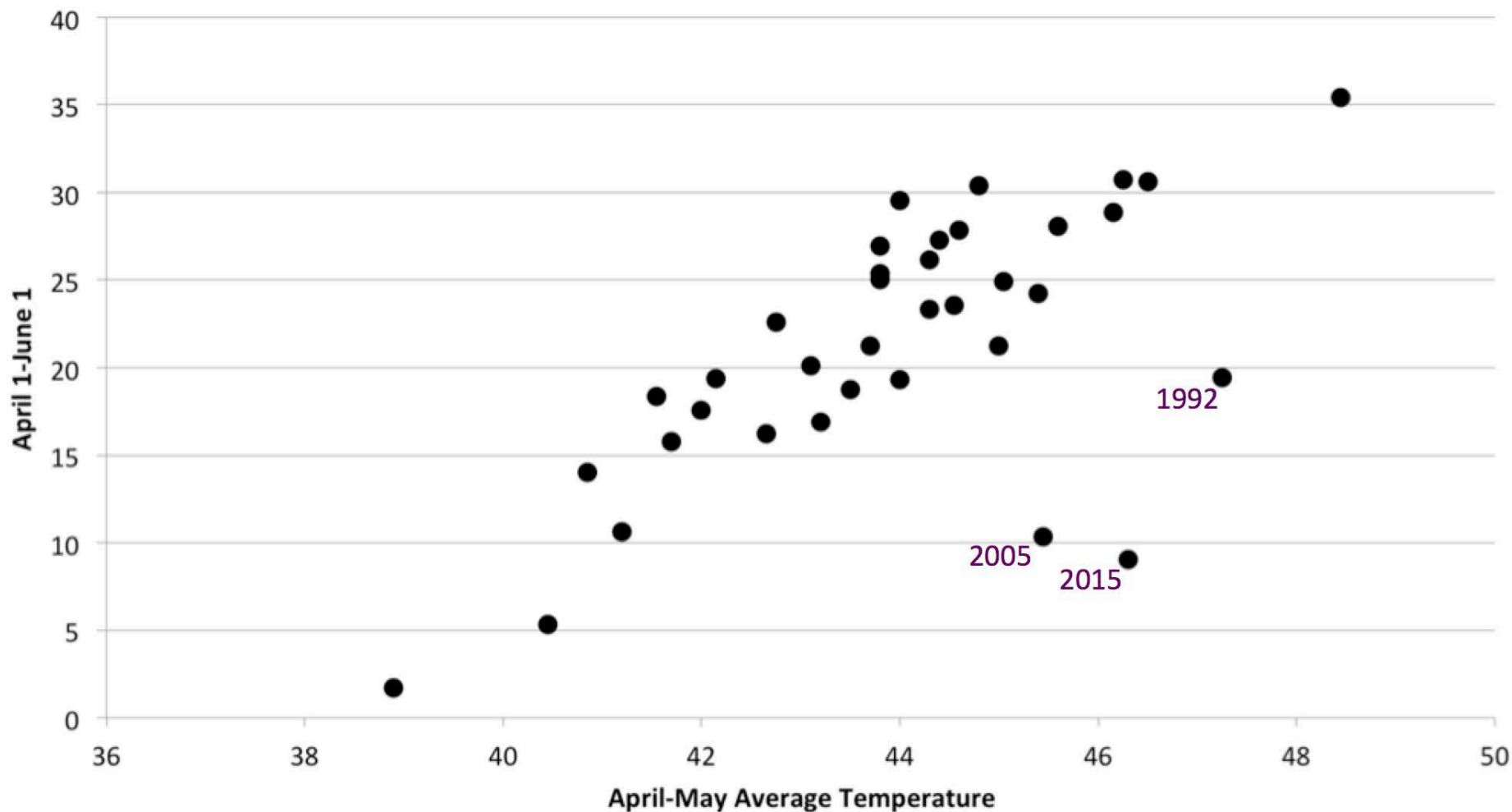


IMME



1983-2018 Composite SWE for:
Harts Pass, Stevens Pass, Stampede Pass, White Pass, Lone Pine

April-May Avg Temperatures vs. April 1-June 1 SWE Difference



Final Remarks

- OK, your lawn has never been greener, but there still are water concerns in various parts of WA state
- April has been warm and wet so far but Feb-Mar were cold and dry (notable exception is the wet Feb-Mar conditions in the Lower Columbia Basin)
- El Niño may continue, with the possibility of strengthening over the course of 2019
- Still anticipating a late spring and summer on the warm side due to multi-year trends and climate model output