

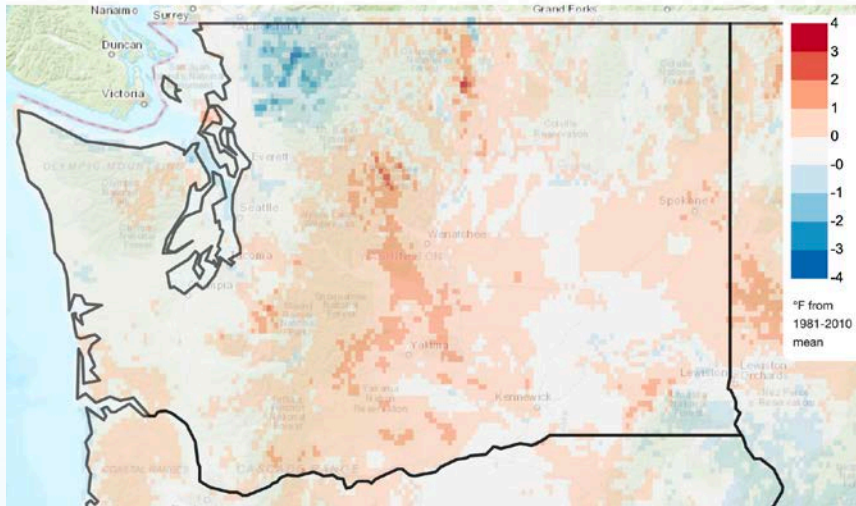
Regional Climate Perspective

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Office of the Washington State Climatologist
Joint Institute for the Study of Atmosphere and Ocean
University of Washington
28 February 2020

2020 Water Year

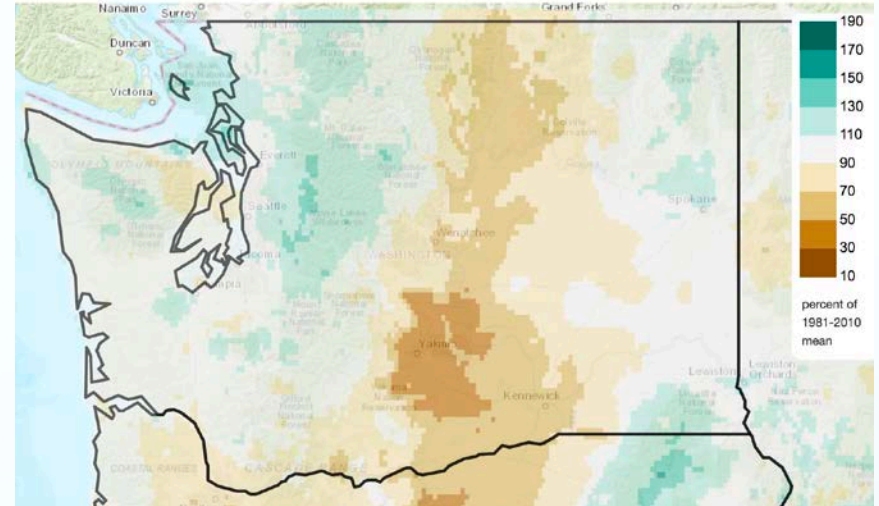
Temperature

Mean Daily Temperature Anomaly, Since Oct 1st
2019/10/01 - 2020/02/25



Precipitation

Total Precipitation Anomaly, Since Oct 1st
2019/10/01 - 2020/02/25



NW Climate Toolbox

- Mainly near-normal temperatures with a tendency to be on the warmer side
 - Oct-Jan statewide avg temps in top third*
- Distinction in precipitation percent of normal between western and eastern WA
 - Oct-Jan statewide avg precip near-normal

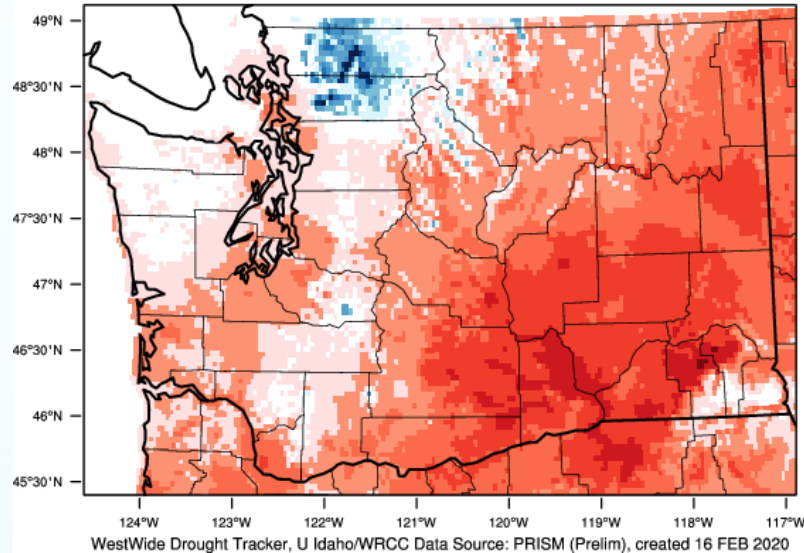
*records since 1895

January 2020

Temperature

Washington - Mean Temperature

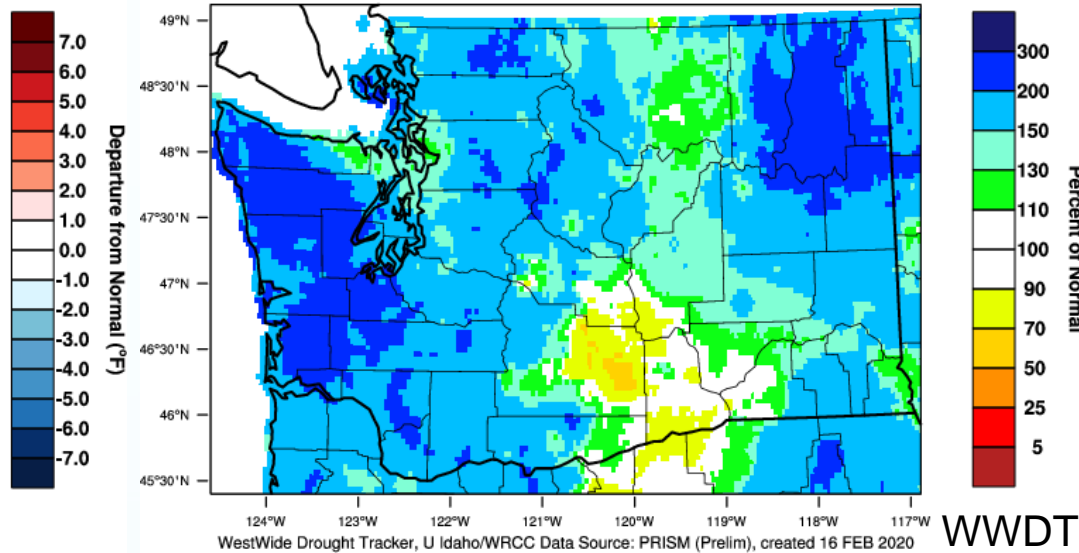
January 2020 Departure from 1981-2010 Normal



Precipitation

Washington - Precipitation

January 2020 Percent of 1981-2010 Normal

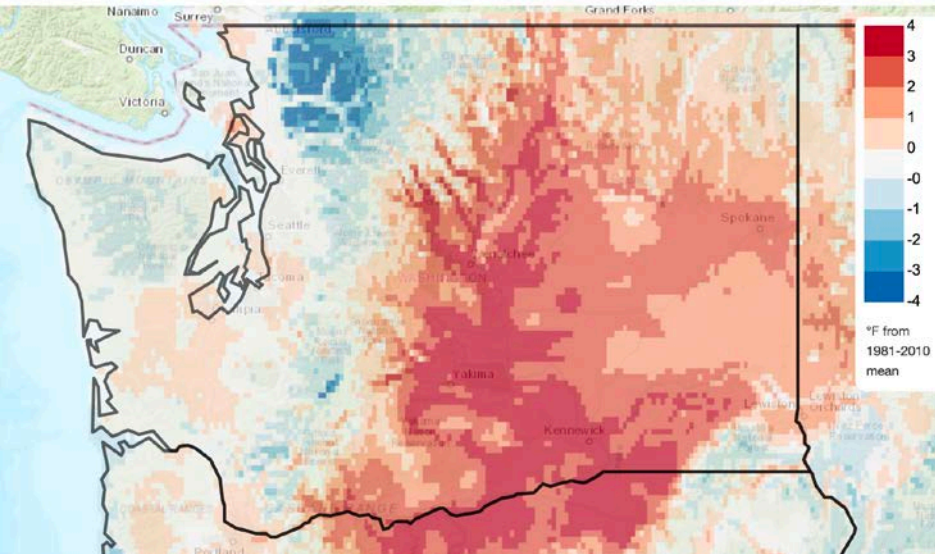


- Much above normal temperatures in eastern WA; tied as the 16th warmest averaged statewide (+2.4°F)
- Averaged statewide, 4th wettest January on record (+4.19"; 169% of normal)

February 2020

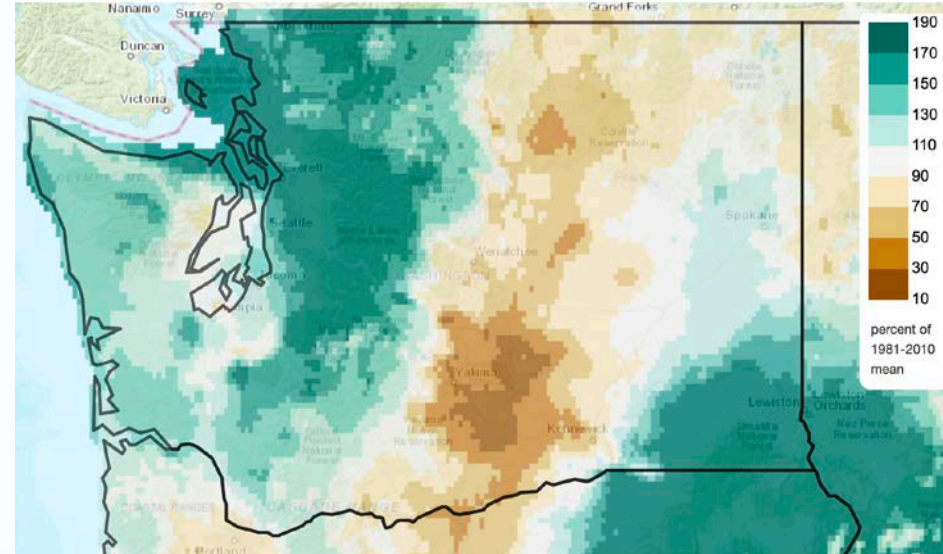
Temperature

Mean Daily Temperature Anomaly, Last 30 Days
2020/01/27 - 2020/02/25



Precipitation

Total Precipitation Anomaly, Last 30 Days
2020/01/27 - 2020/02/25



NW Climate Toolbox

- Above normal Feb temperatures in eastern WA; overall temperature pattern similar to January
- Rain shadows fairly evident in precipitation percent of normal

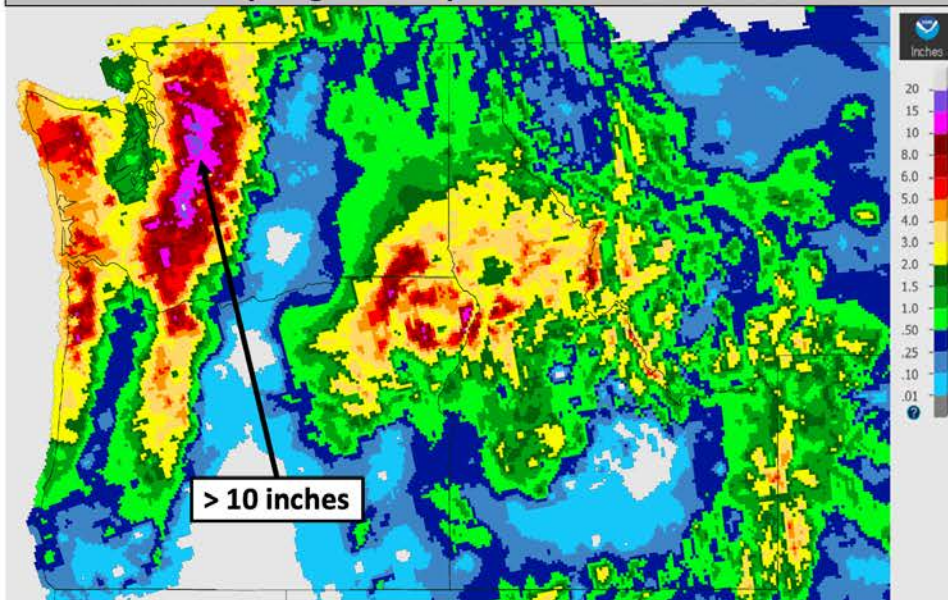
Early Feb. Flooding

CW3E Event Summary: 4–8 Feb 2020



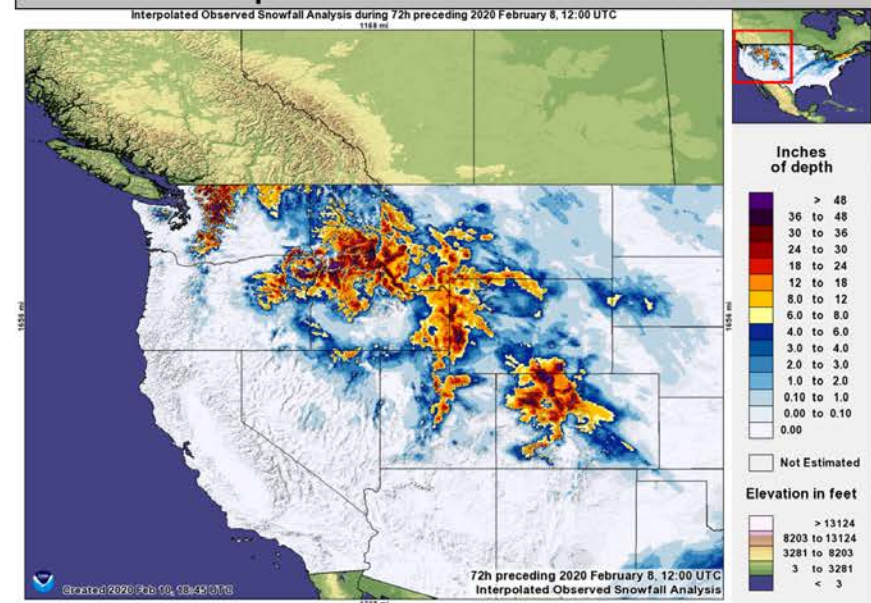
Center for Western Weather
and Water Extremes
SCRIPPS INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

NWS 7-day Stage IV Precipitation: Valid 1200 UTC 10 Feb



Source: NOAA/NWS Advanced Hydrologic Prediction Service, <https://water.weather.gov/ahps/>

72-h Interpolated Snowfall: Valid 1200 UTC 8 Feb



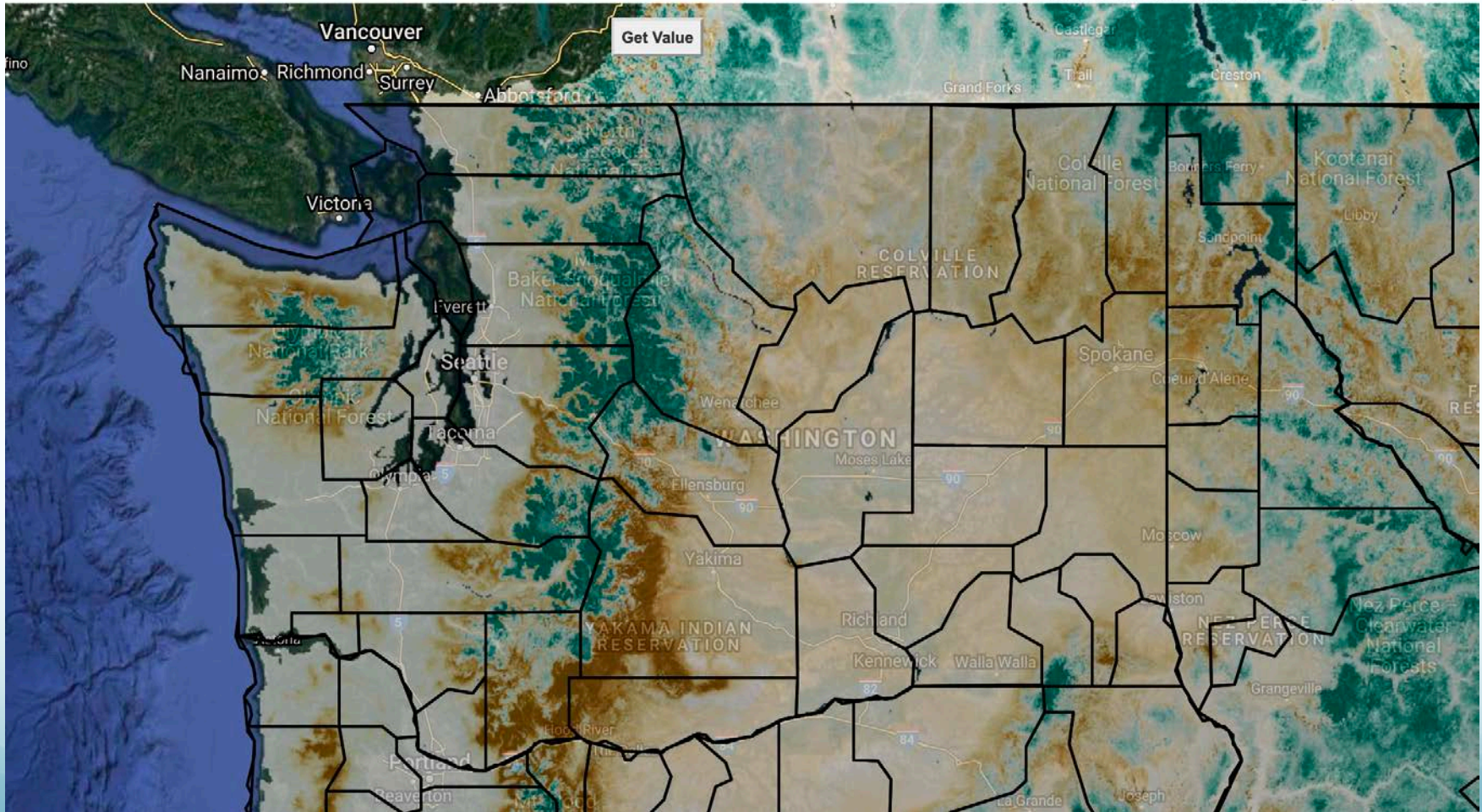
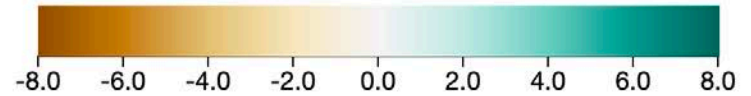
Source: NOAA/NWS NOHRSC, <https://www.nohrsc.noaa.gov/>

- Total estimated precipitation over the 7-day period ending 1200 UTC (4 AM PST) 10 Feb exceeded 5 inches over portions of western WA and northwestern OR, with the highest amounts (> 10 inches) over the WA Cascades
- Inland penetration of AR conditions also supported heavy snowfall (1–3 feet) across the higher terrain in the interior Pacific Northwest and Rocky Mountains

SWE Difference

SWE Difference from Average (SNODAS)

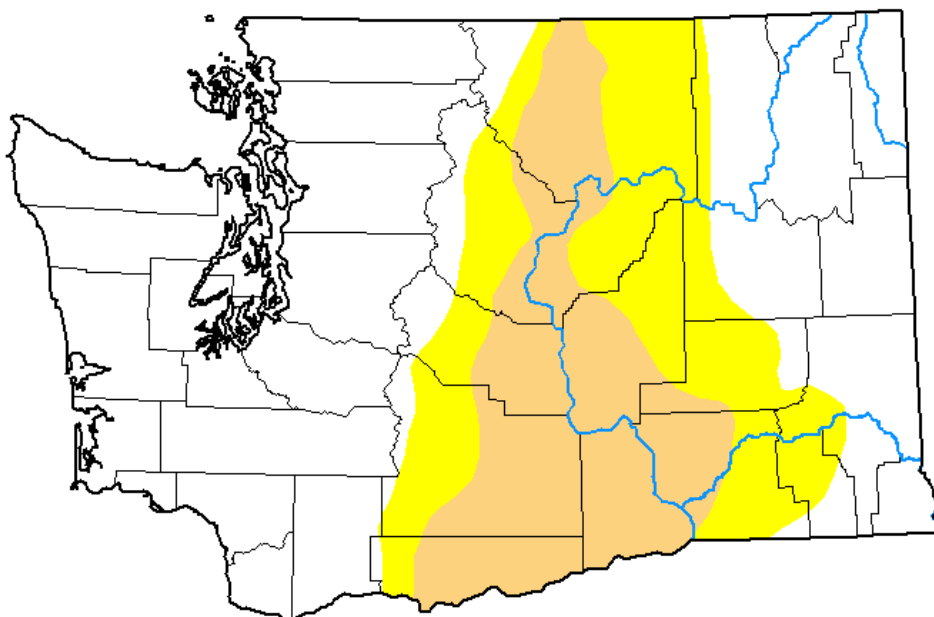
2020-02-24 to 2020-02-24, Mean, vs. 1919 - 1919









US Drought Monitor

U.S. Drought Monitor **Washington**

February 25, 2020
(Released Thursday, Feb. 27, 2020)
Valid 7 a.m. EST



Intensity:

-  None
-  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. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

David Miskus
NOAA/NWS/NCEP/CPC

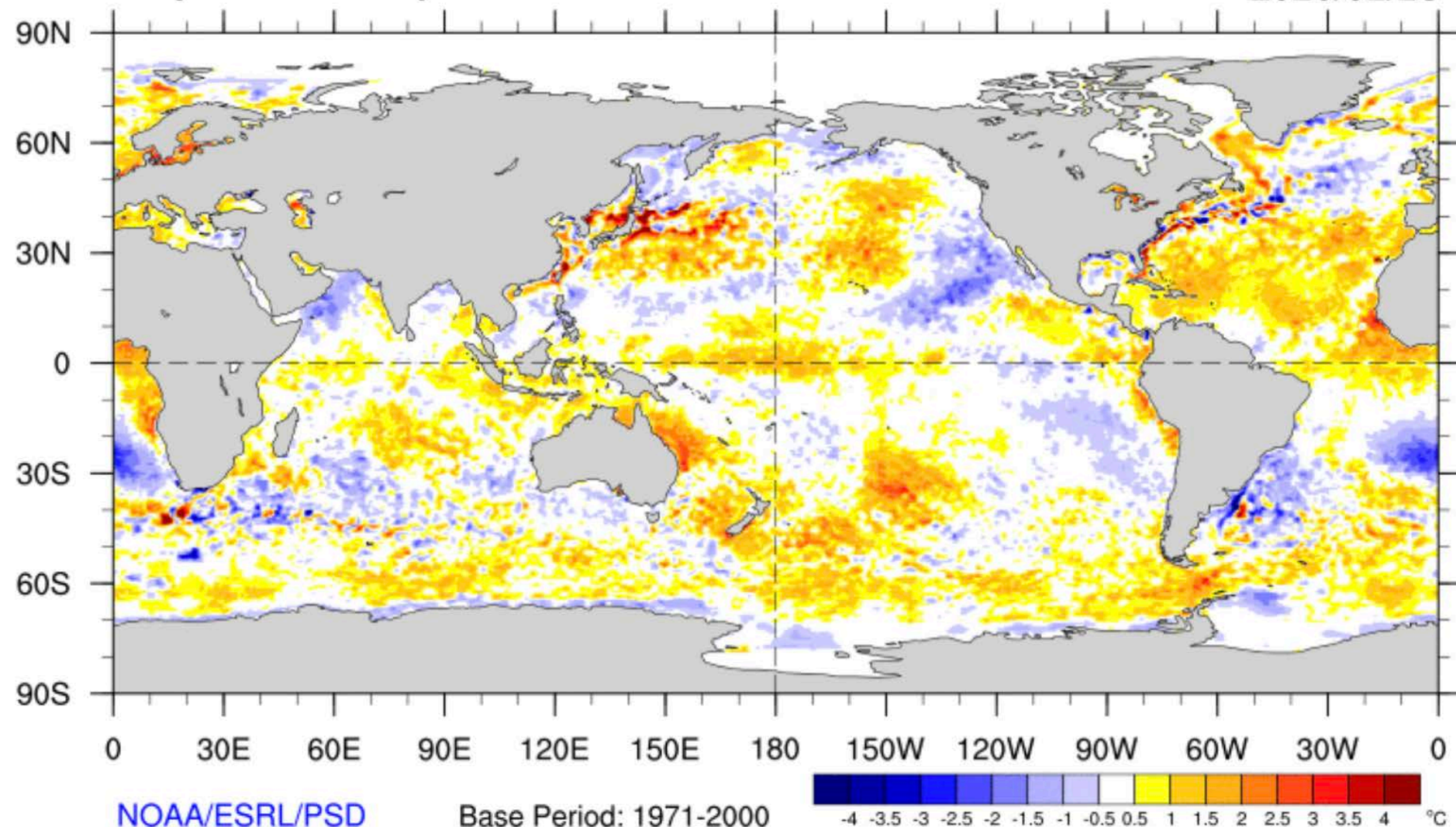


droughtmonitor.unl.edu

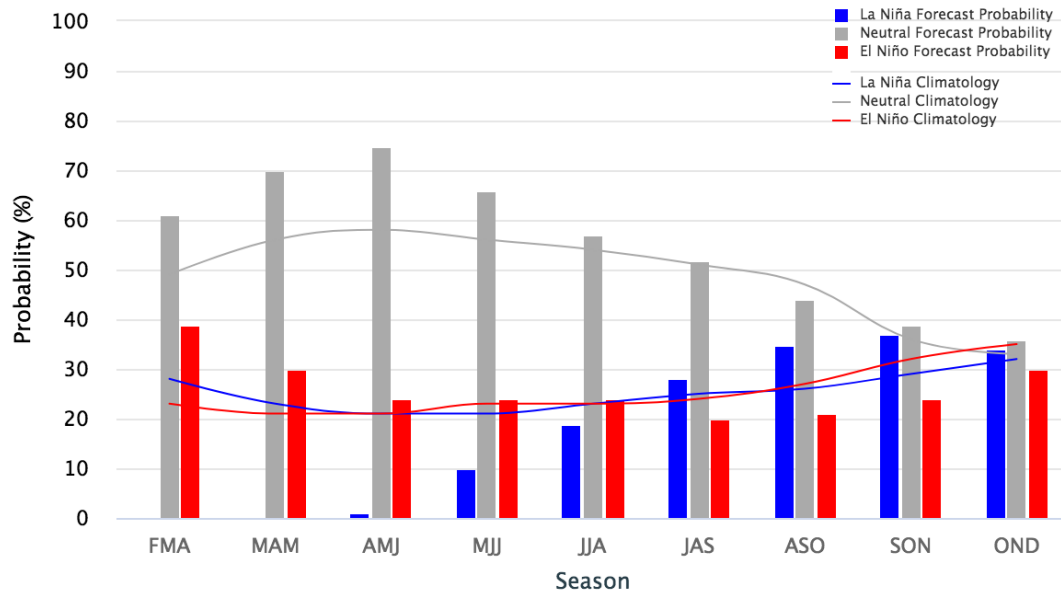
Sea Surface Temperature Anomalies 23 February 2020

Daily SST Anomaly

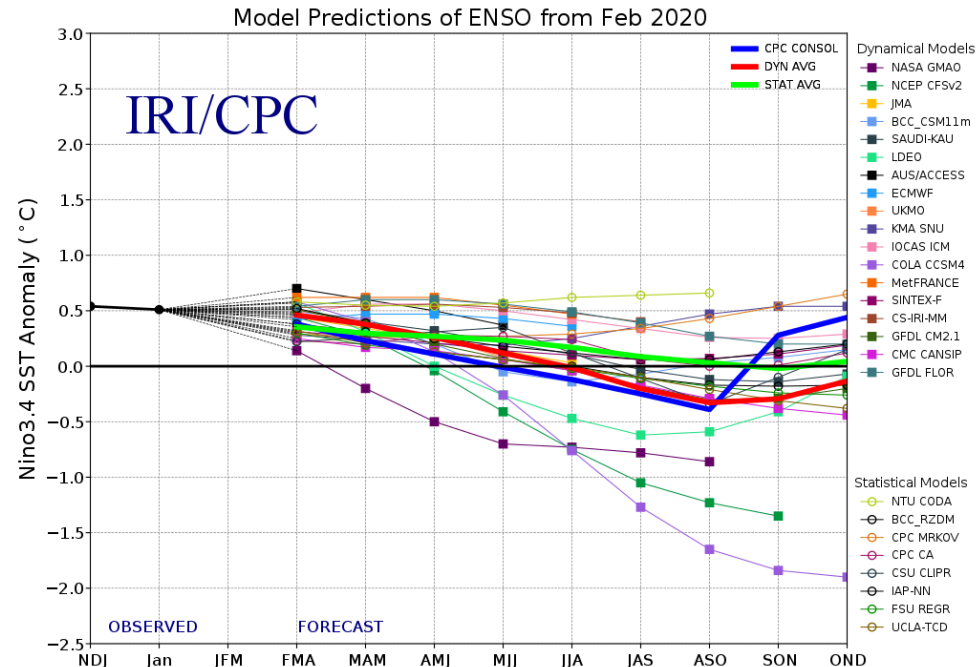
2020/02/23

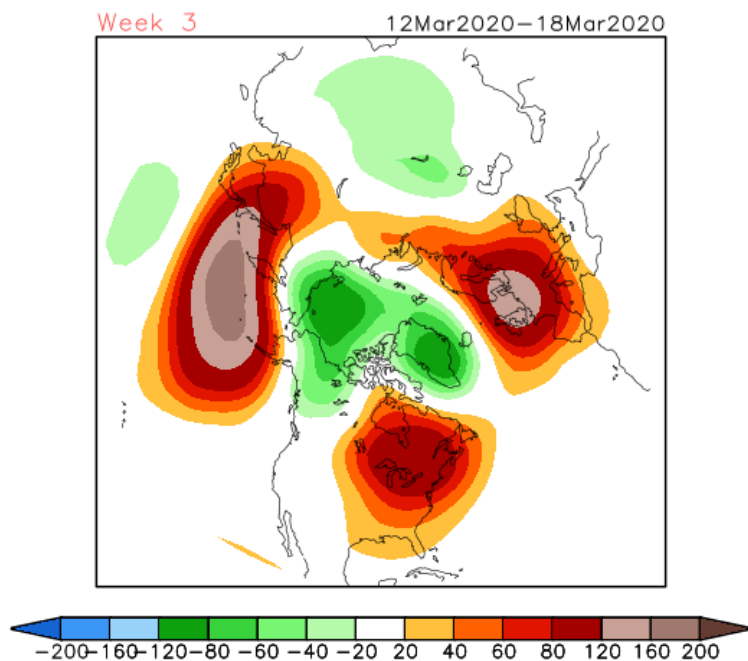


ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5°C to 0.5°C



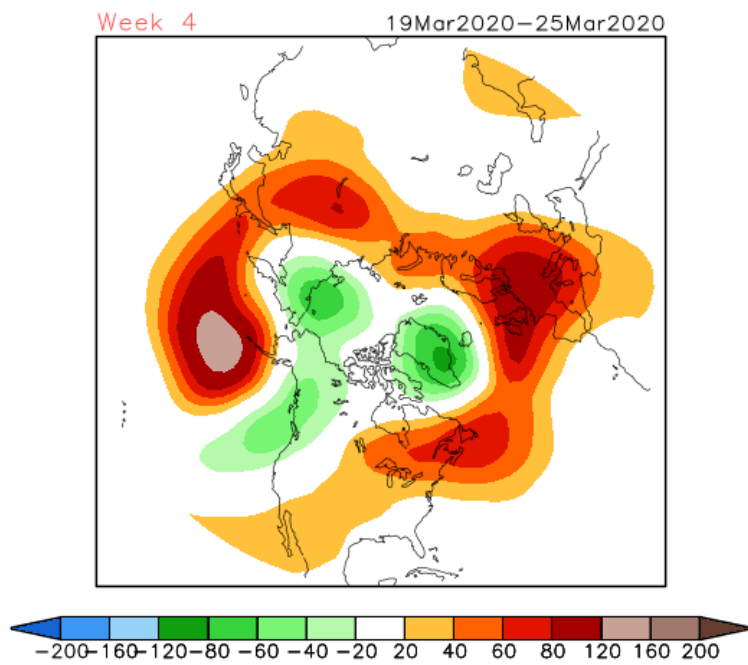
El Niño/La Niña Forecasts Indicate Elevated Odds of Near-Neutral Conditions through Summer 2020



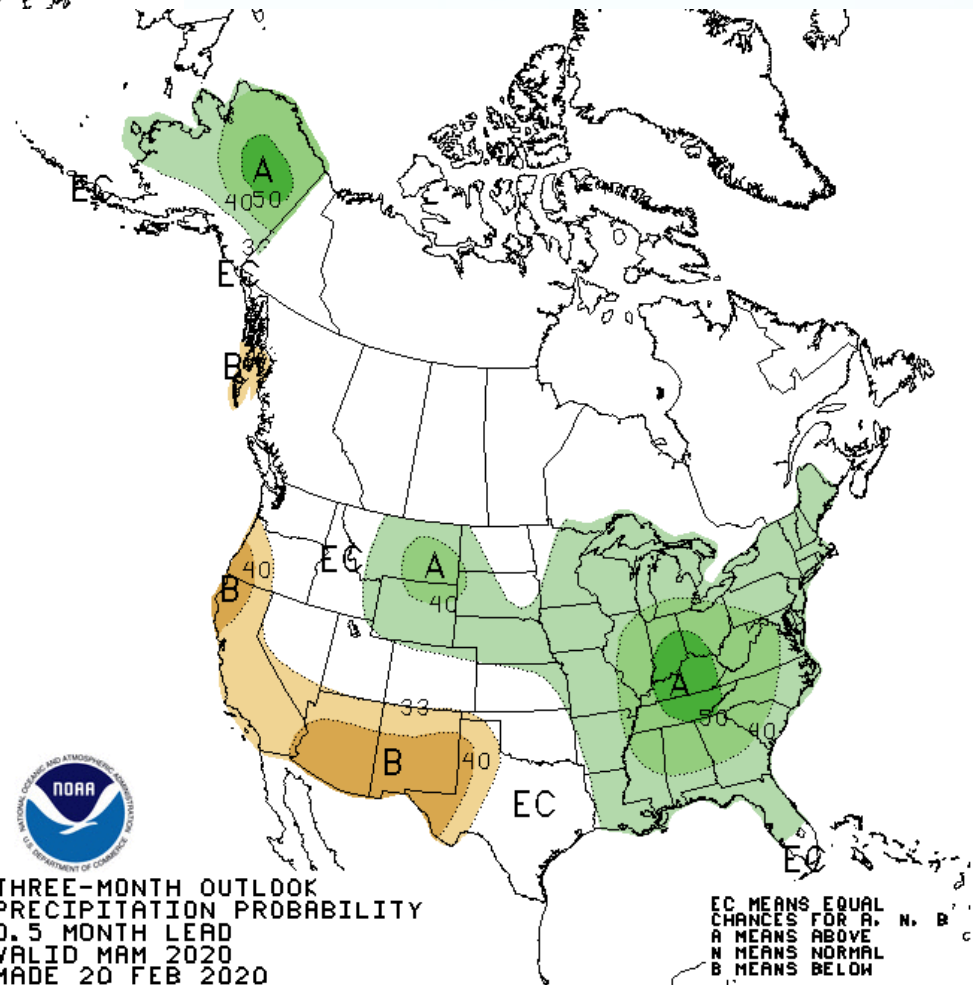
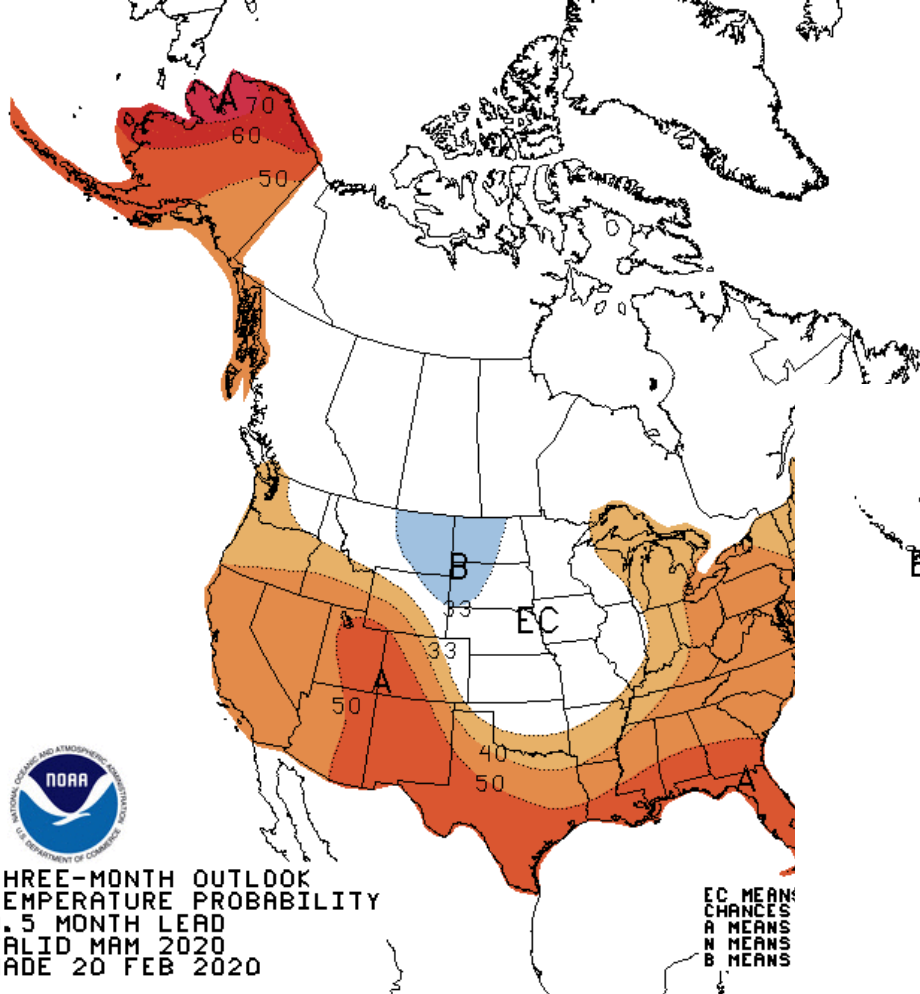


Latest Set of Week 3-4
Forecasts from CFSv2

Anomalously low 500 hPa Z
over WA late: Near-normal
weather early but then cooler
and wetter than normal late



NOAA/CPC Forecasts for Mar-May 2020

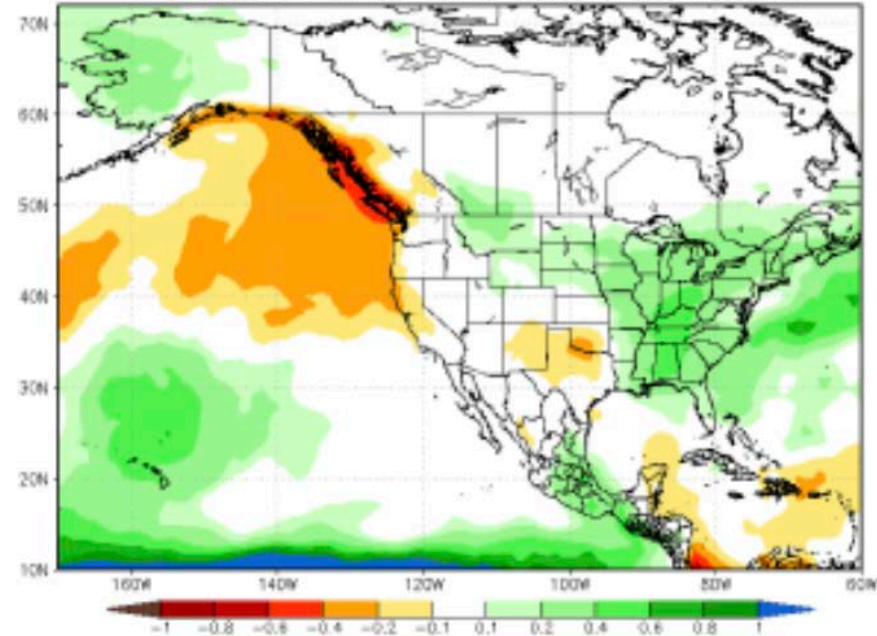


Climate Model Ensemble Projections for MAM Precipitation

NMME

IMME

NMME Forecast of Prec. rate Anom IC=202002 for Lead 1 2020MAM



C3S multi-system seasonal forecast

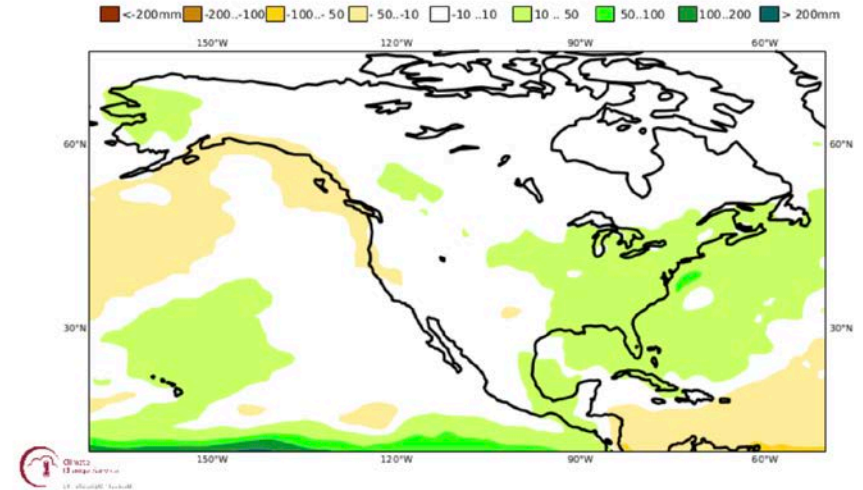
Mean precipitation anomaly

Nominal forecast start: 01/02/20

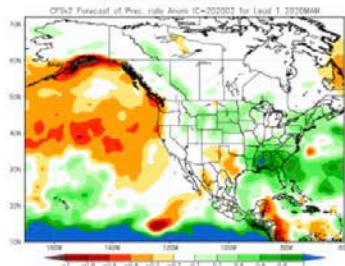
Variance-standardized mean

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

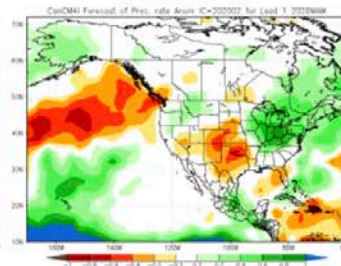
MAM 2020



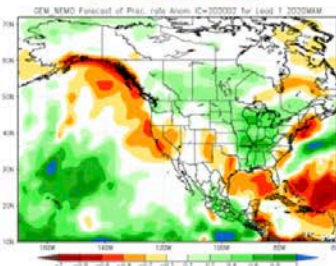
NCEP CFSv2



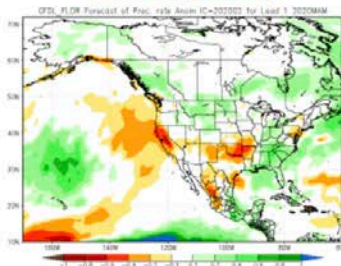
CanCM4i



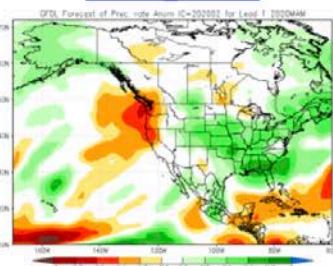
GEM NEMO



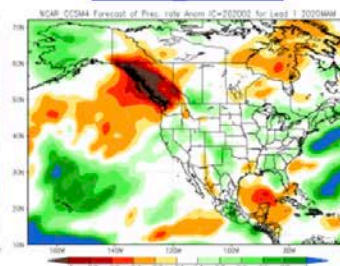
GFDL FLOR



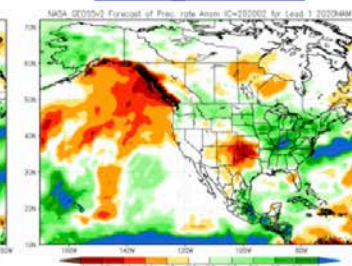
GFDL CM2.1



NCAR CCSM4



NASA GEOS5v2



IMME

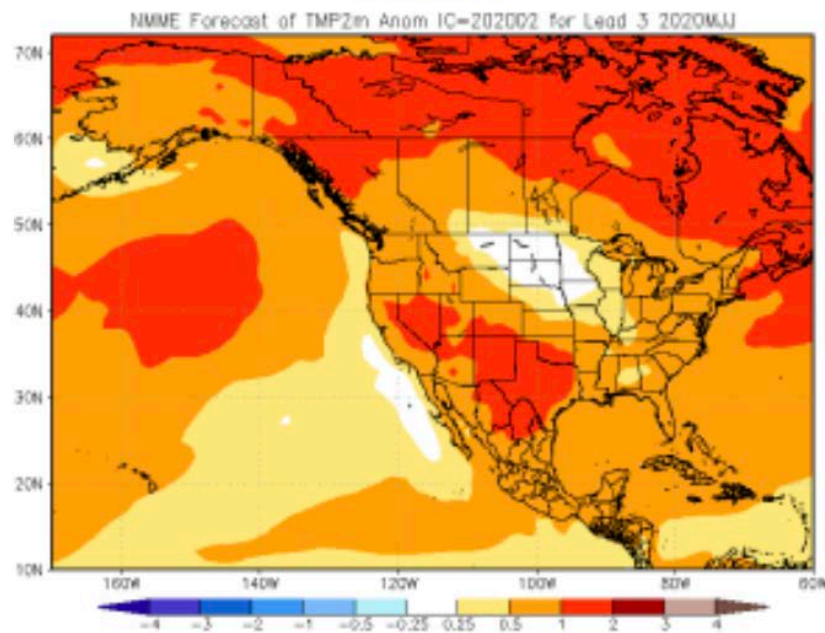
IMME



Warmer than normal temperatures for May-July and July-Aug (not shown)

NMME

NMME



IMME

C3S multi-system seasonal forecast

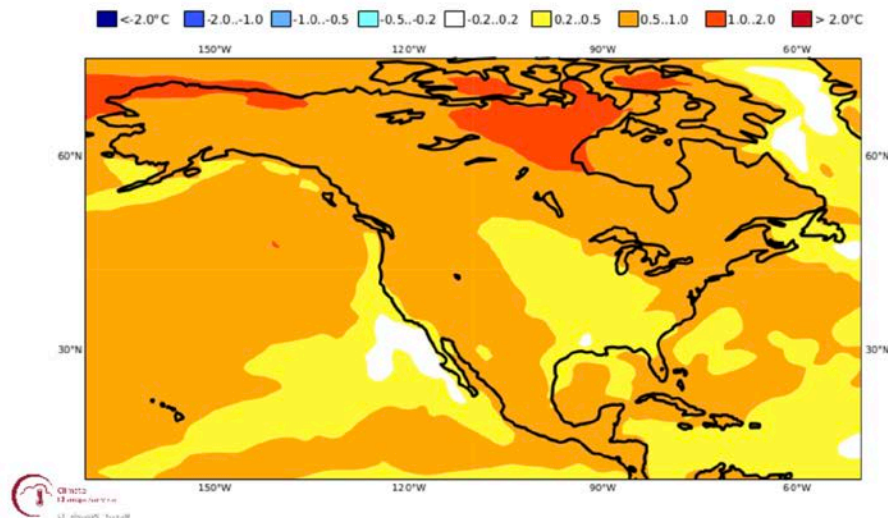
Mean 2m temperature anomaly

Nominal forecast start: 01/02/20

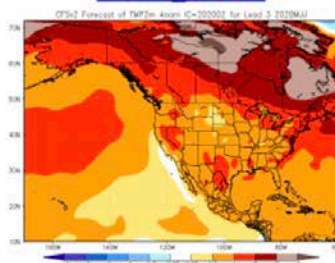
Variance-standardized mean

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

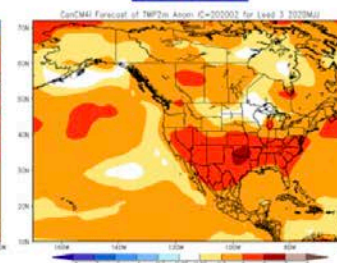
MJJ 2020



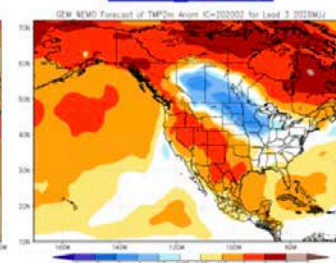
NCEP CFSv2



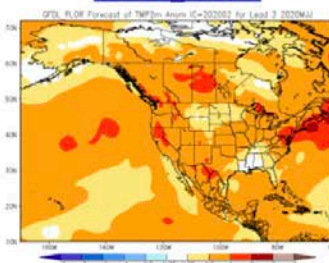
CanCM4i



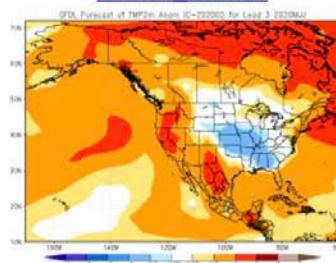
GEM NEMO



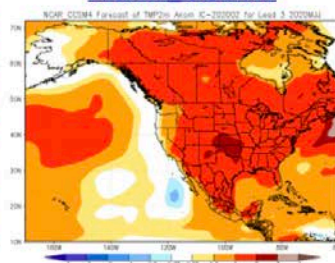
GFDL FLOR



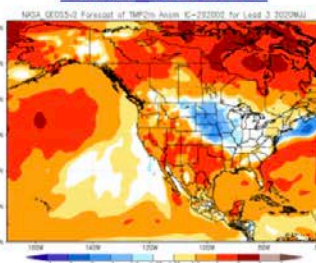
GFDL CM2.1



NCAR CCSM4



NASA GEOS5v2

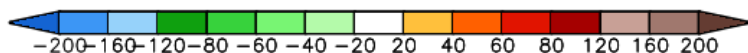
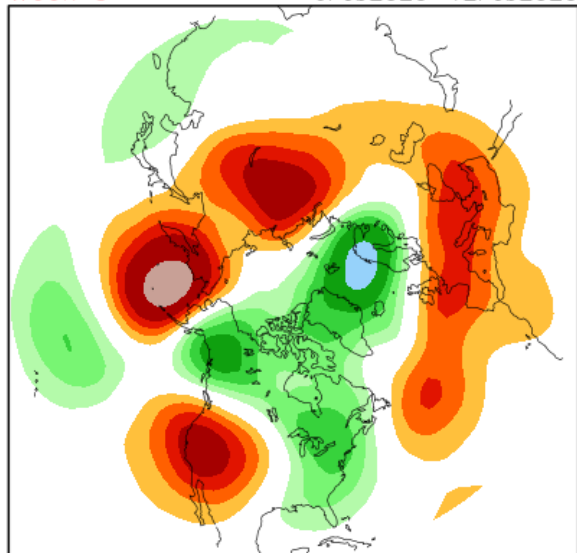


IMME

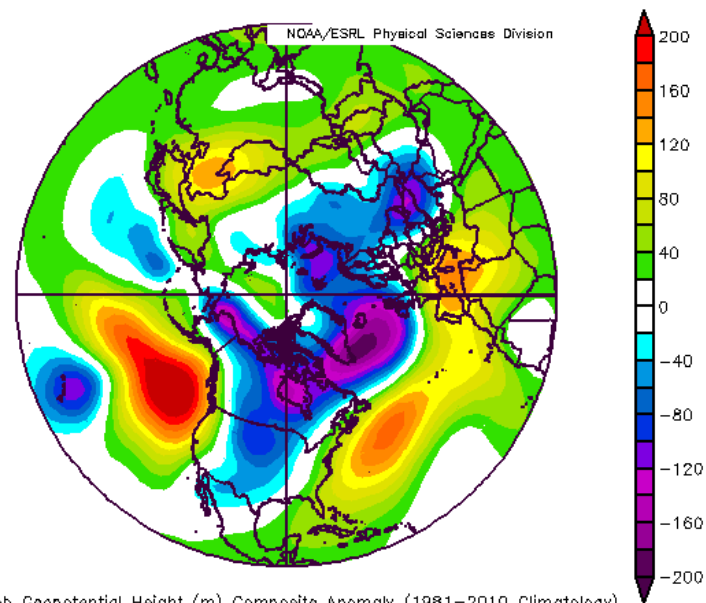
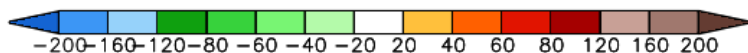
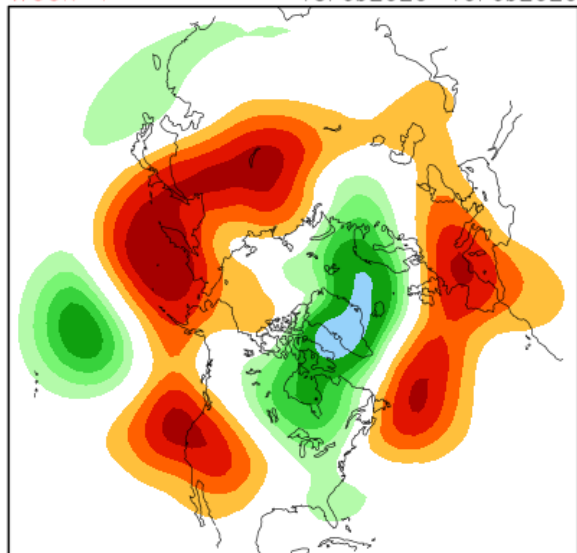
IMME



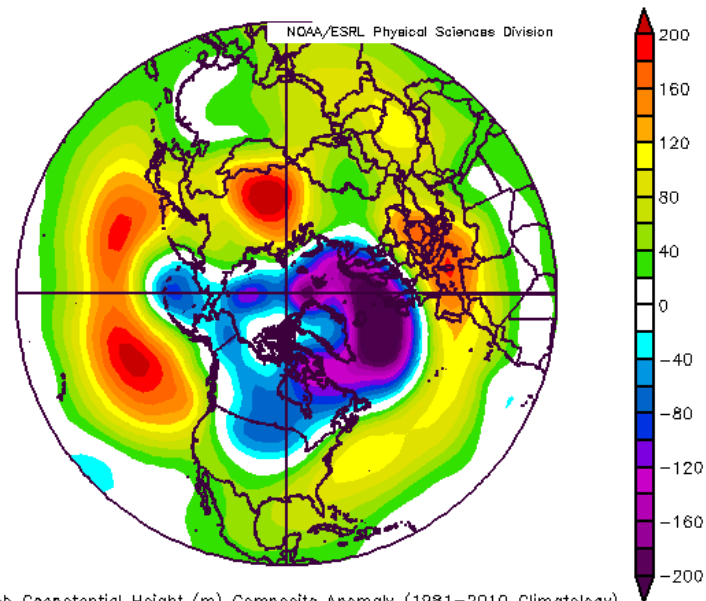
Week 3 6Feb2020–12Feb2020



Week 4 13Feb2020–19Feb2020



500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
2/6/20 to 2/12/20

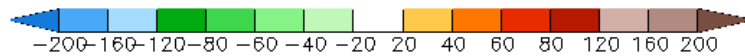
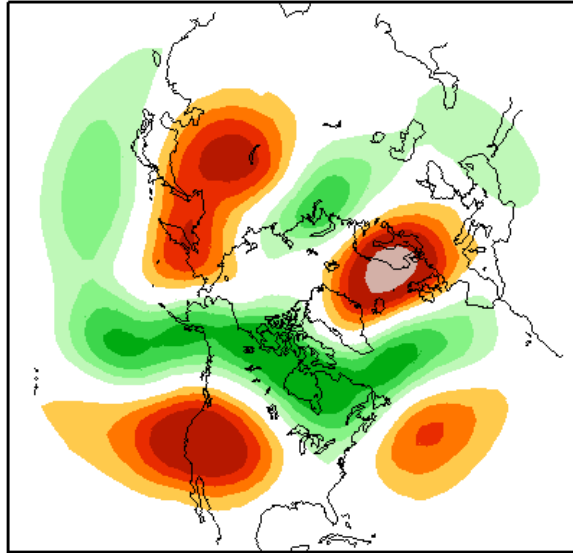


500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
2/13/20 to 2/19/20

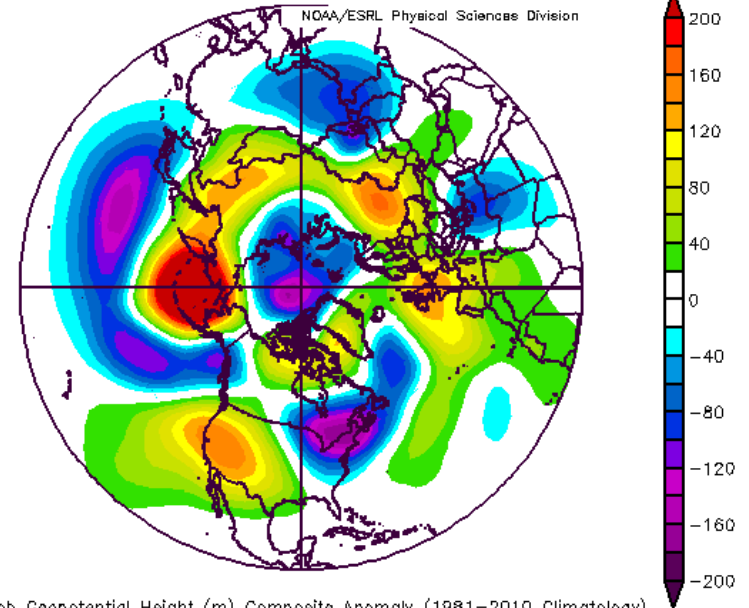
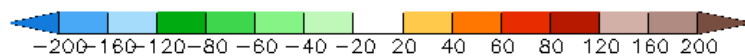
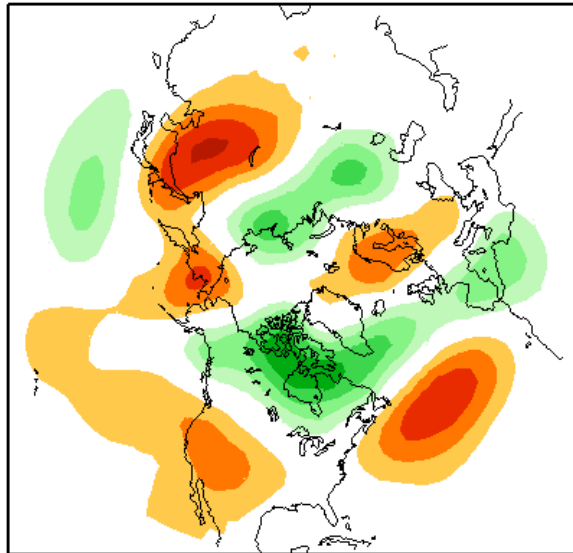
NCEP/NCAR Reanalysis

A Fine Forecast

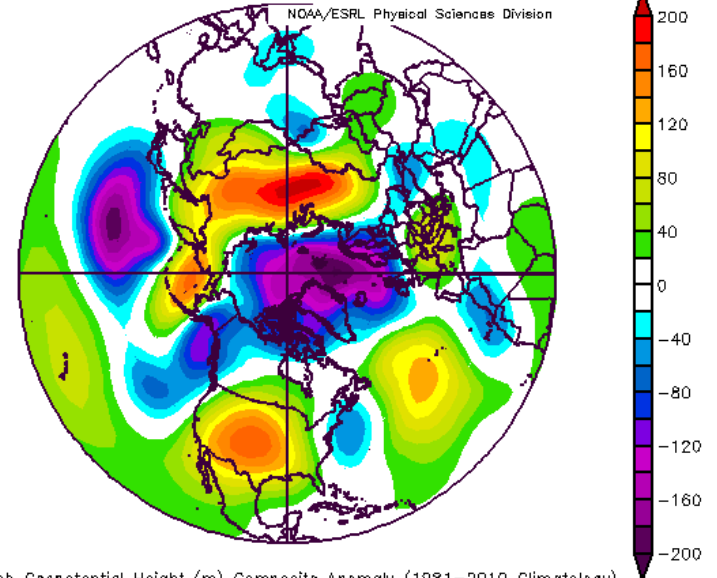
Week 3 9Mar2017–15Mar2017



Week 4 16Mar2017–22Mar2017



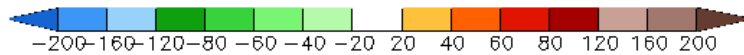
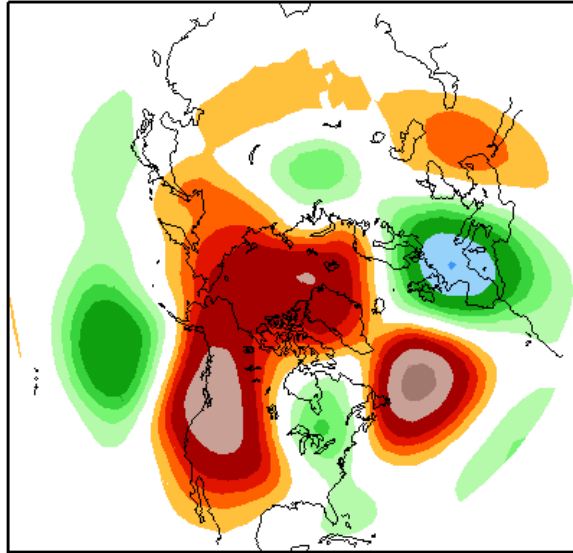
500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
3/9/17 to 3/15/17



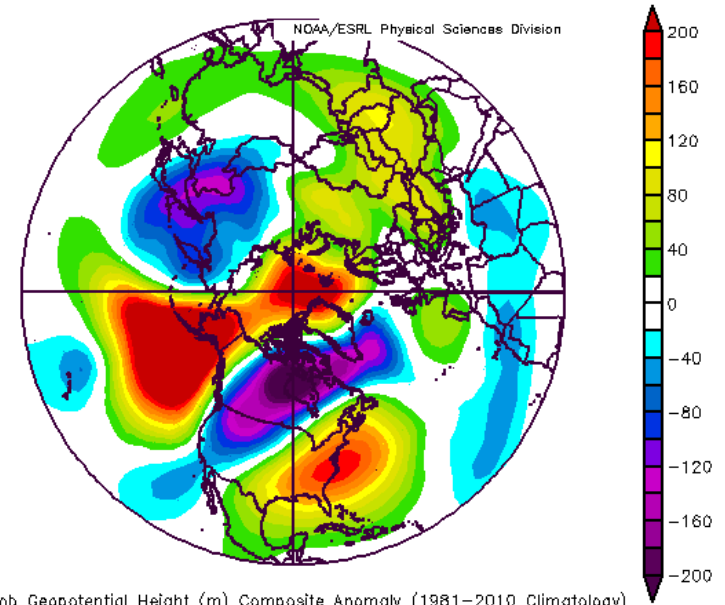
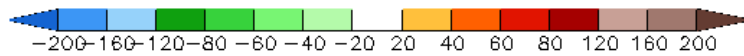
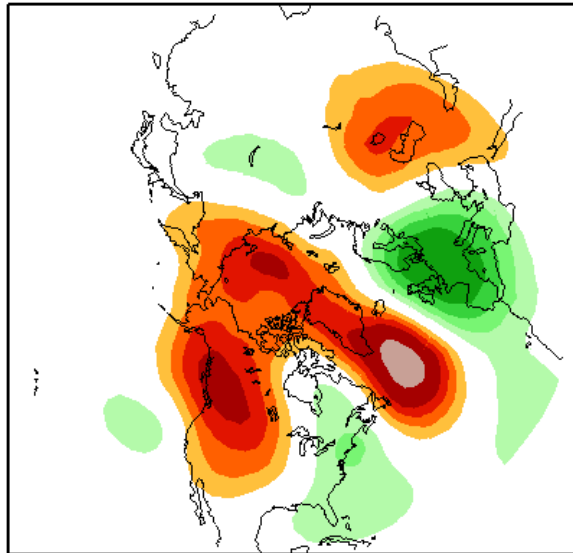
500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
3/16/17 to 3/22/17
NCEP/NCAR Reanalysis

A Real Stinker of a Forecast

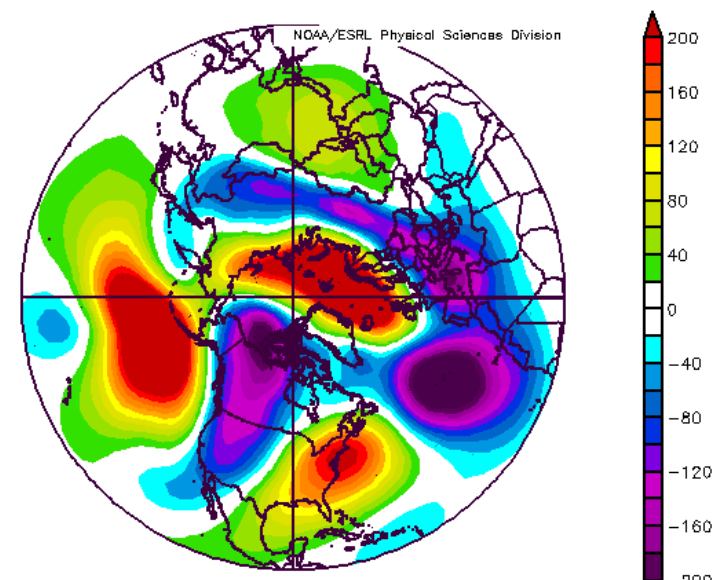
Week 3 15Feb2018–21Feb2018



Week 4 22Feb2018–28Feb2018



500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
2/15/18 to 2/21/18



500mb Geopotential Height (m) Composite Anomaly (1981–2010 Climatology)
2/22/18 to 2/28/18

NCEP/NCAR Reanalysis

Validation Summary

24 Cool Season (Oct-Apr) and 14 Warm Season (May-Sept) forecasts using a 3-Tier System (Below, Near-Normal, Above) with respect to:

- 500 hPa Geopotential Heights (Z)
- 500 hPa Zonal Wind (U)
- 500 hPa Meridional Wind (V)

Hits

Forecast	Verification	Z	U	V
Normal	Normal	6	5	8
Either Positive or Negative	Direction Verified	10	9	6

Total: 44 vs. 38 by chance

Category 1 Errors

Forecast	Verification	Z	U	V
Normal	Positive or Negative	8	10	12
Either Positive or Negative	Normal	5	12	5

Total: 52 vs. 51 by chance

Bad Misses

Forecast	Verification	Z	U	V
Either Positive or Negative	Opposite Direction	9	2	7

Total: 18 vs. 25 by chance

Final Remarks

- Water year 2020 warmer than normal for most of the state, but dry east of the Cascades
- Overall wet conditions for the rest of the state improved high elevation snow and Drought Monitor conditions
- ENSO not liable to be a significant player in the climate system during the next 6 months
- Expecting temperatures to run moderately above normal for spring but even warmer for May-July and July-Aug
- Spring precipitation may be on the drier side
- I plan on putting my tomato plants out early this spring