



CLIMATE & WEATHER A FUTURE VISION FOR AG

CLIMATE, WEATHER AND OUTLOOKS

MARK EWENS, KNOX RADIO STAFF METEOROLOGIST

OWNER / OPERATOR **HOME ON THE PRAIRIE WEATHER LLC**

Some images courtesy of Rob Kupec KVRR Chief Meteorologist

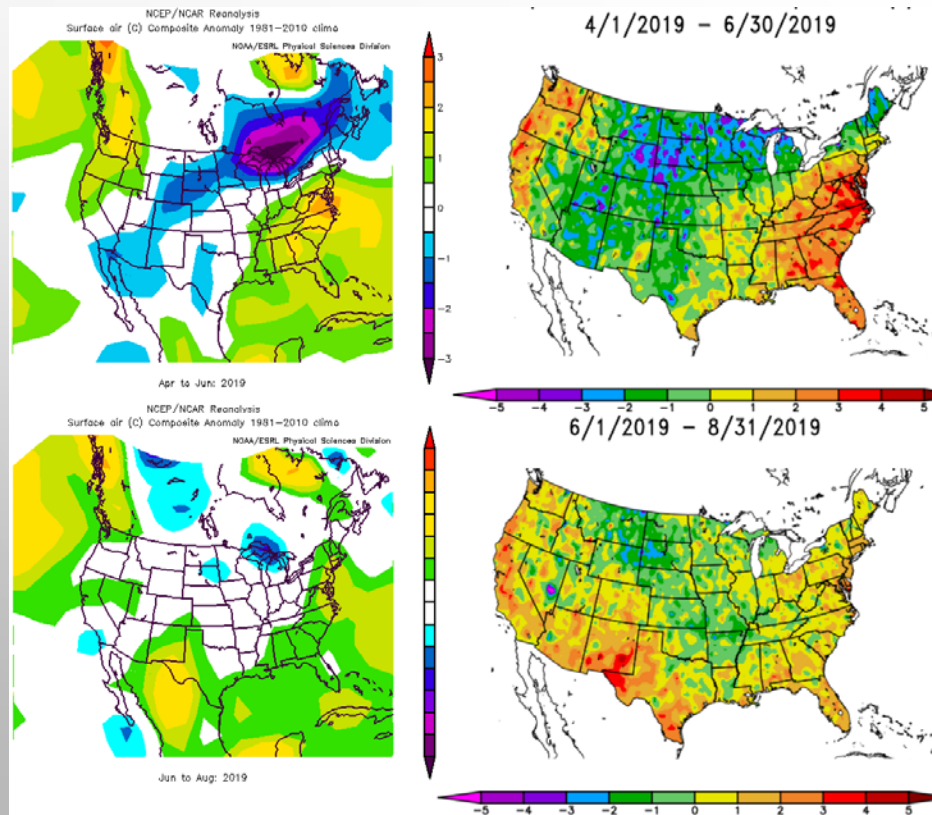


WHO IS THIS GUY?

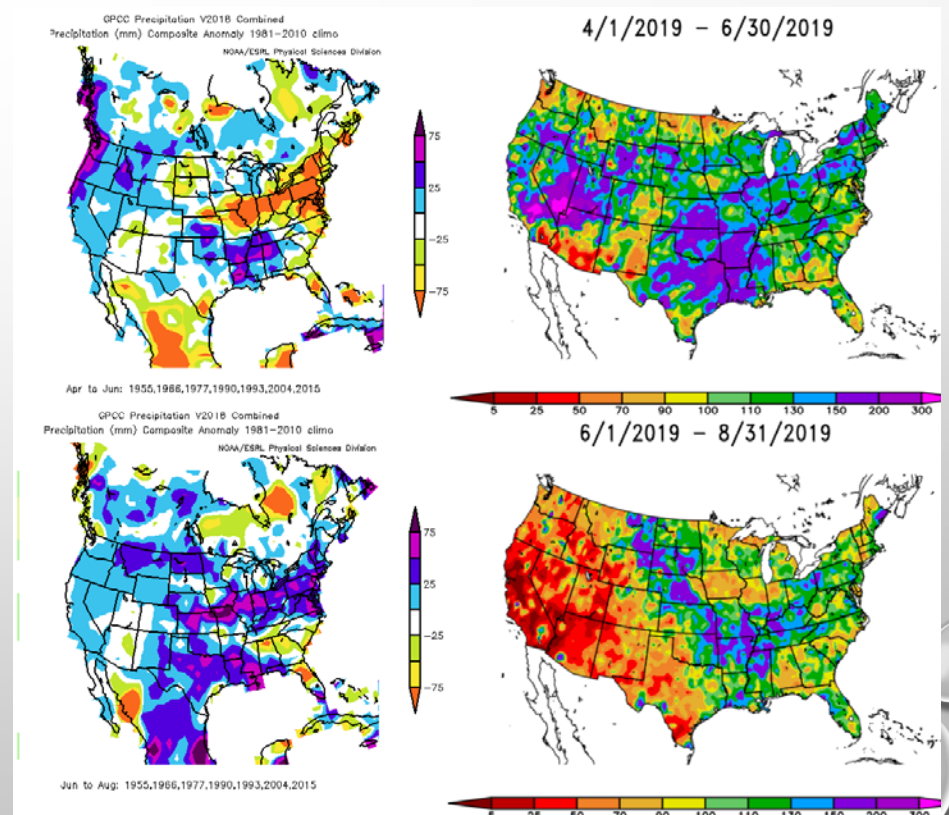
- NEW ORLEANS NATIVE, RED RIVER VALLEY RESIDENT SINCE 1979
- USAF OBSERVER / FORECASTER 1974 - 1982*
- NATIONAL WEATHER SERVICE FARGO 1979*-1995
- GRAND FORKS 1995-2014 - NWS COOPERATIVE WEATHER NETWORK MANAGER
- CLIMATE SERVICES FOCAL POINT 2002 – 2014
- DID STINTS AT NDSU 1980 -1986 STUDIED UNDER DR. JOHN ENZ
- KNOX STAFF METEOROLOGIST 2015 – PRESENT
- **HOME ON THE PRAIRIE WEATHER LLC** DATA MINING / CLIMATE OUTLOOKS

TRUTH IN ADVERTISING

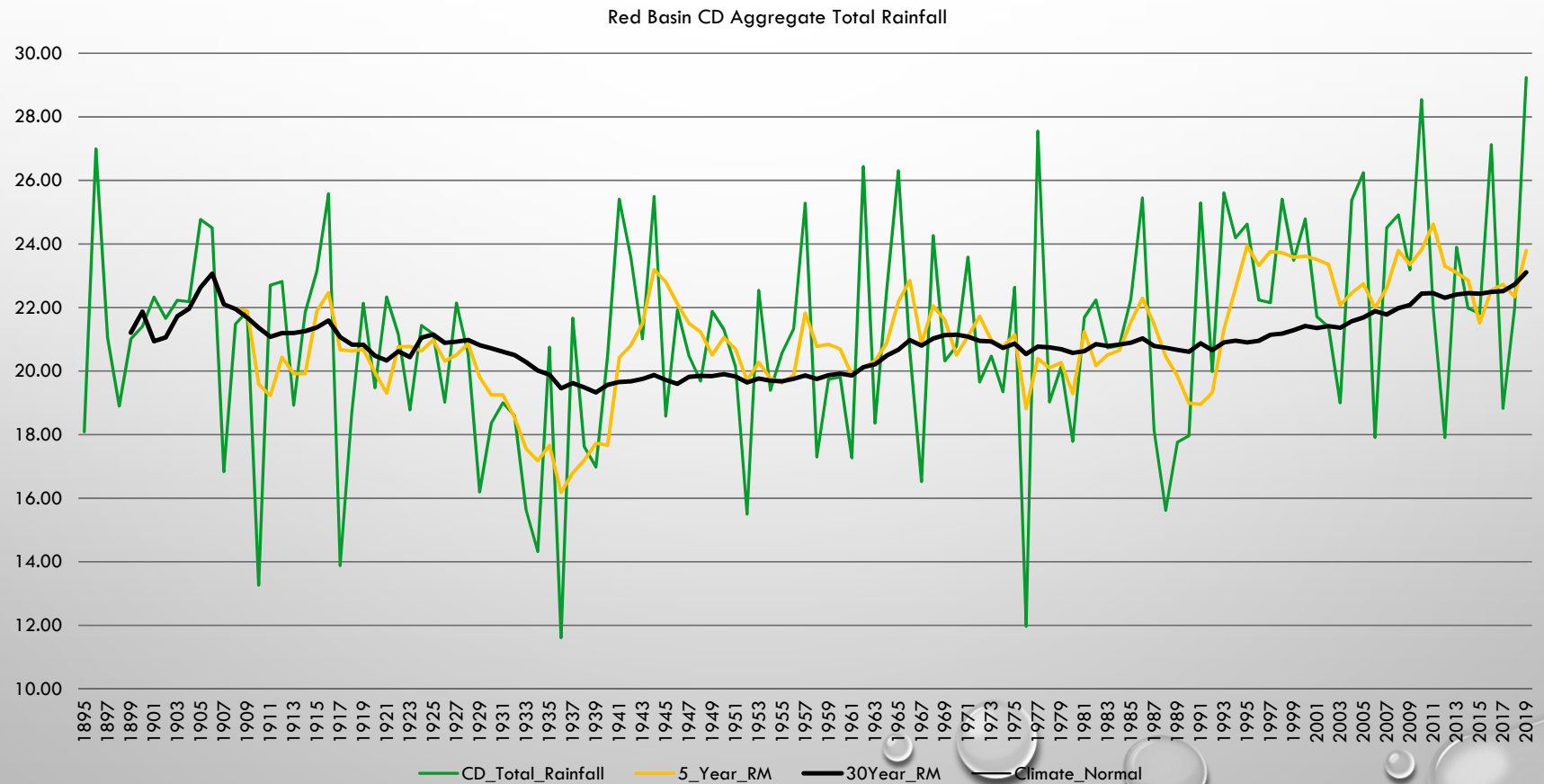
Spring & Summer 2019 Temperature Outlook & Verification



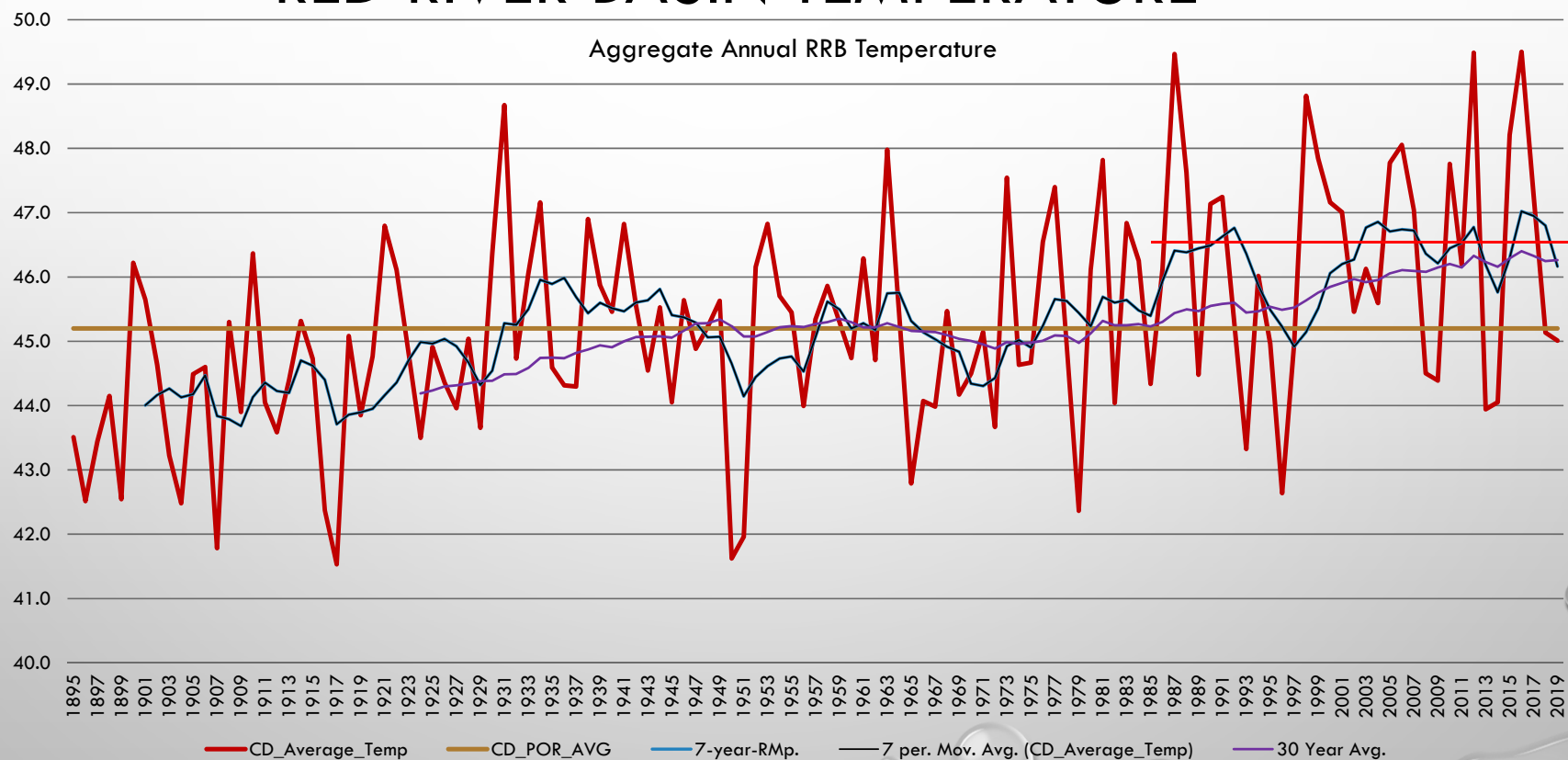
Spring & Summer 2019 Precipitation Outlook & Verification



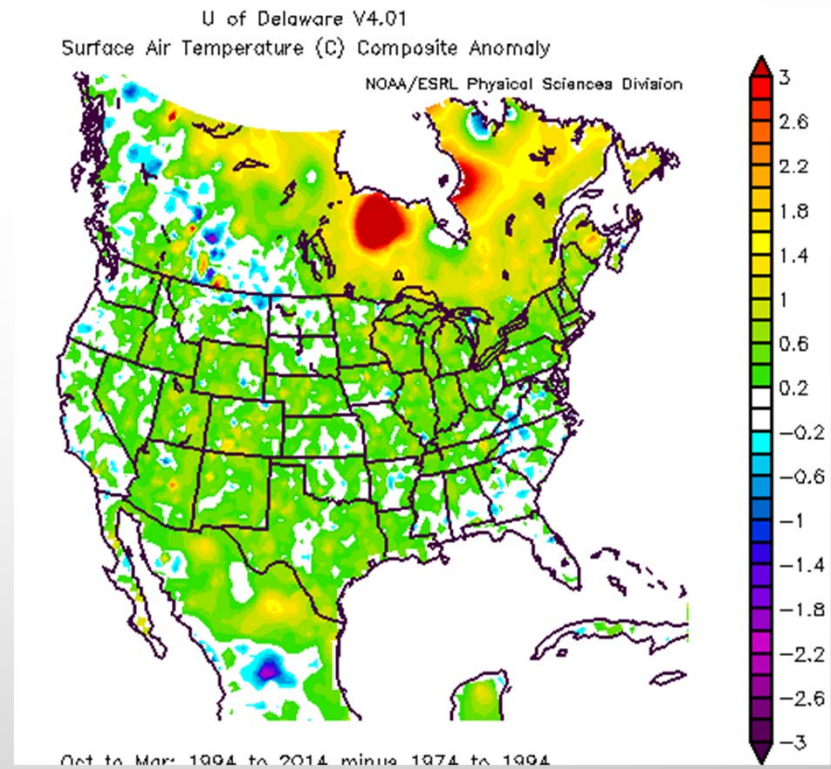
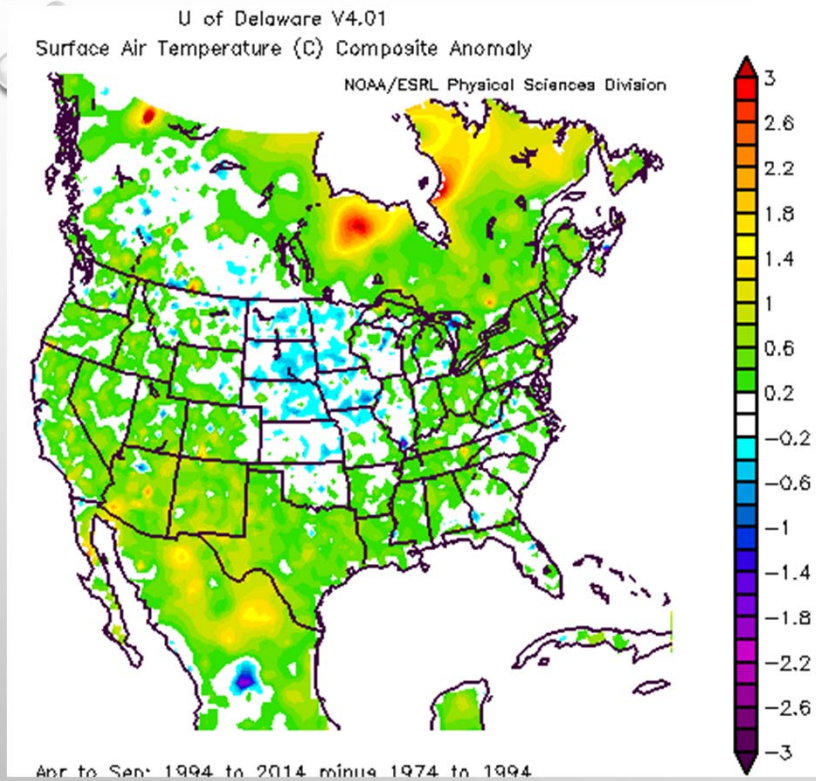
POR RED RIVER BASIN PRECIPITATION



RED RIVER BASIN TEMPERATURE

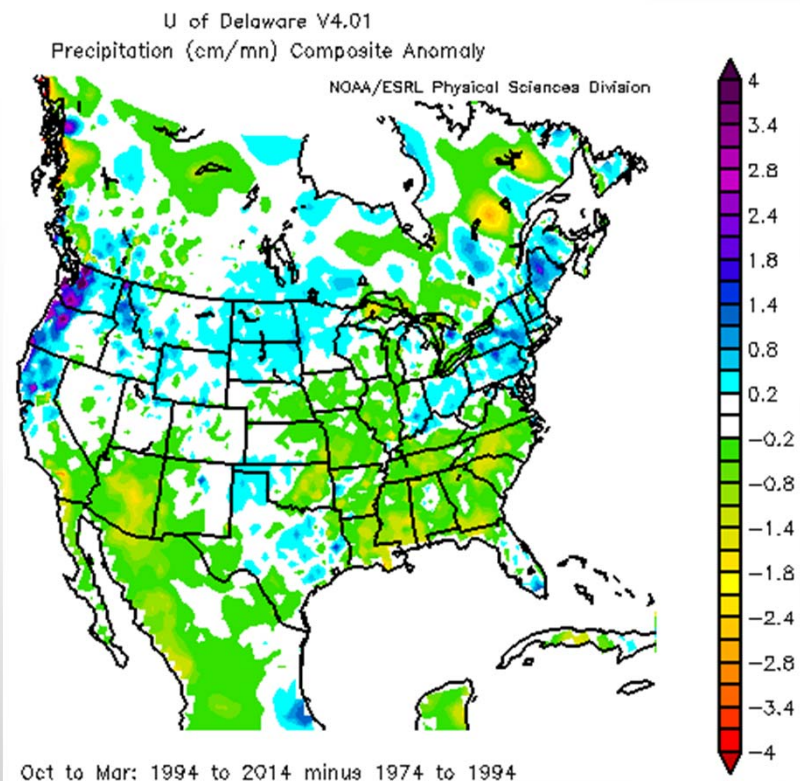
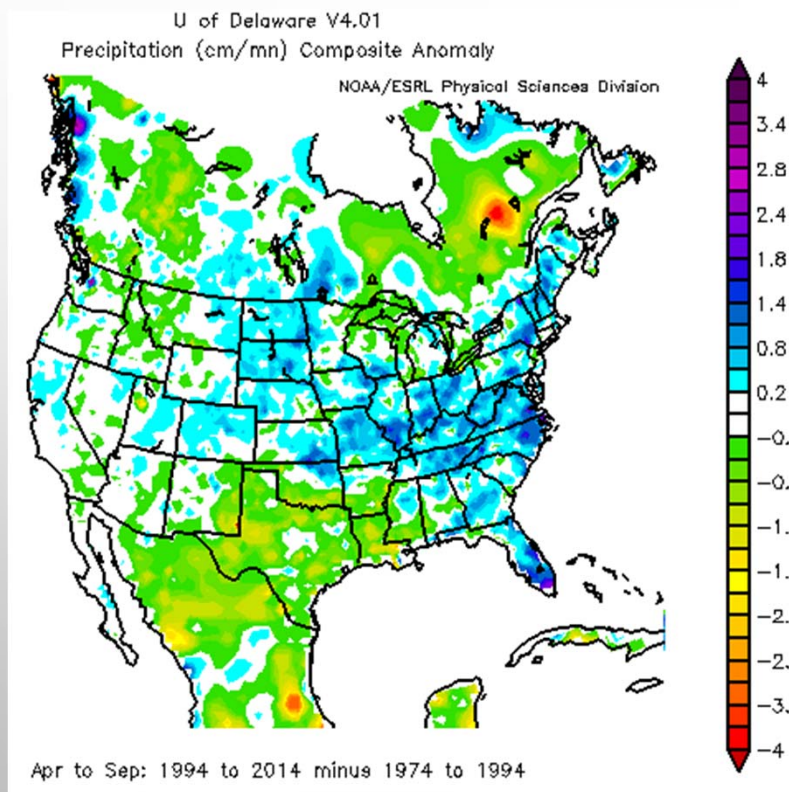


HISTORY AS A GUIDE TO TOMORROW

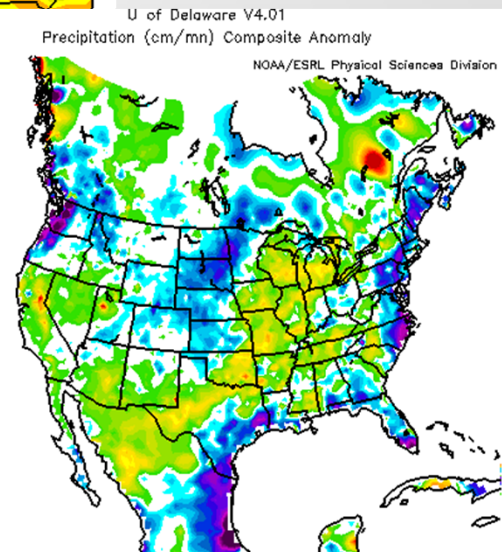
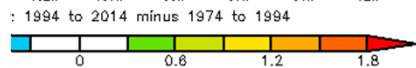
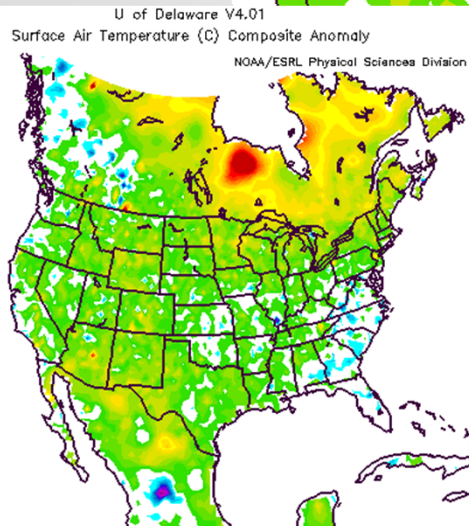
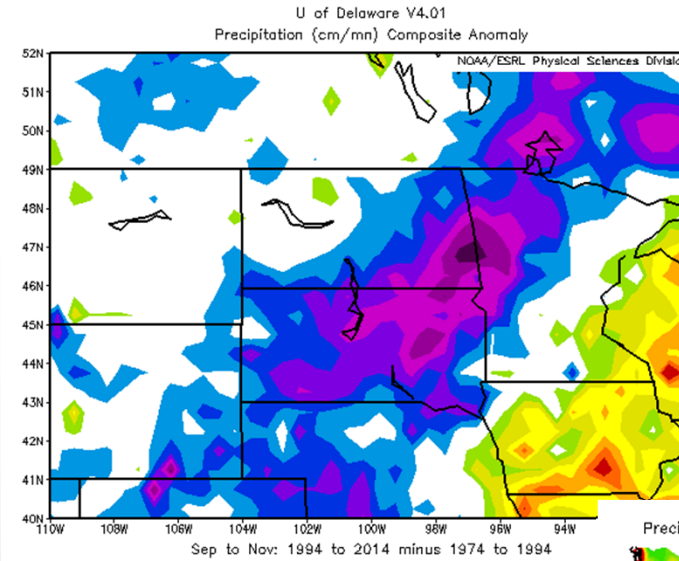
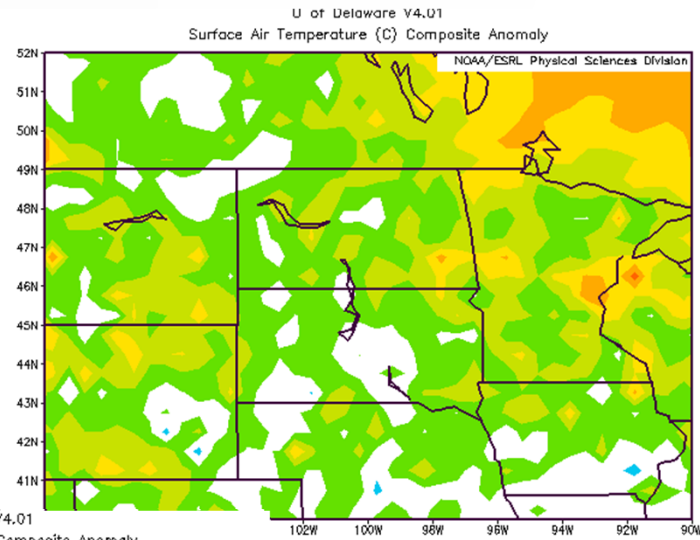


The “Warm Season” has an odd cool area mid continent that shows up in the “Cool Season” as well

HISTORY AS A GUIDE TO TOMORROW

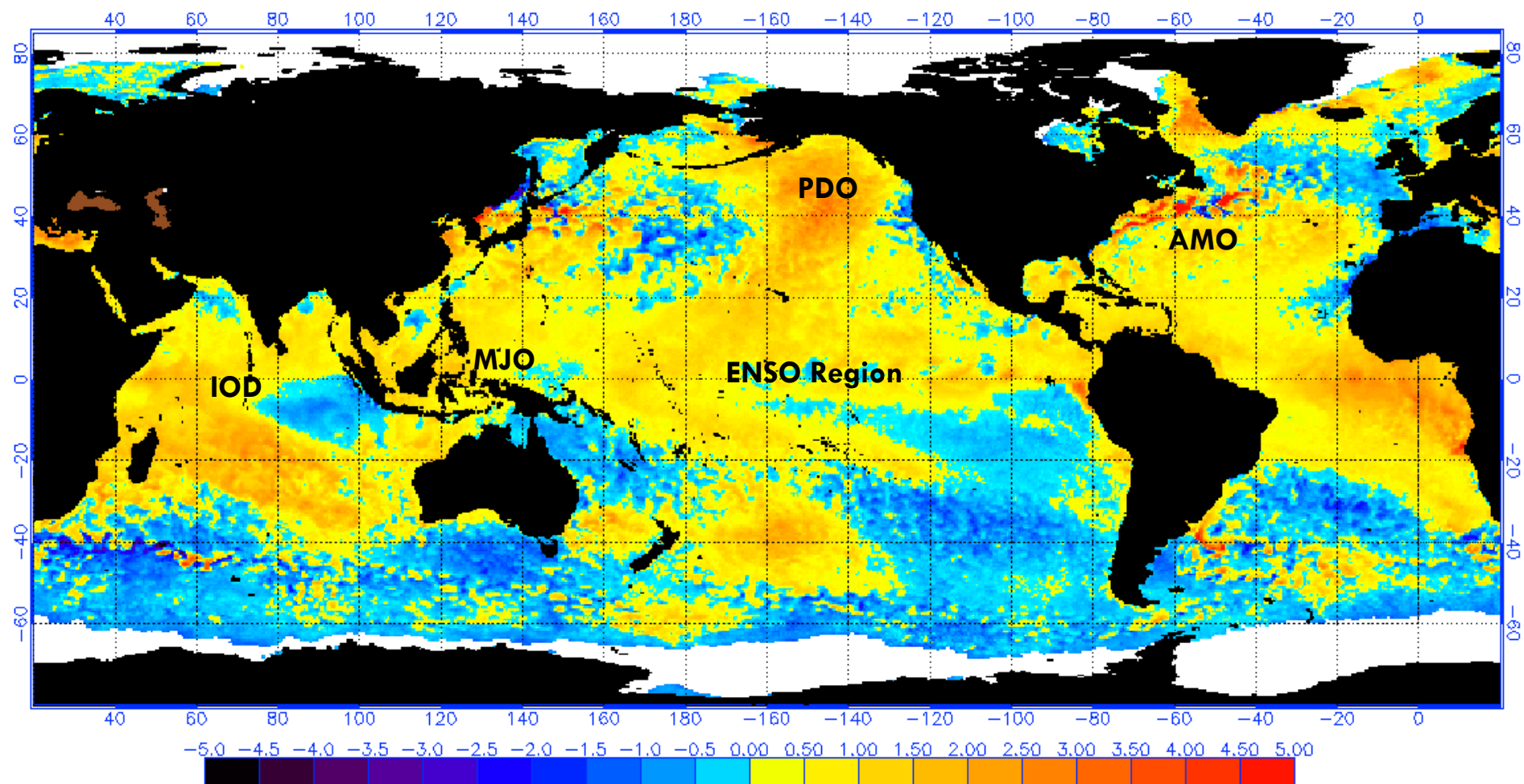


HISTORY AS A GUIDE TO TOMORROW

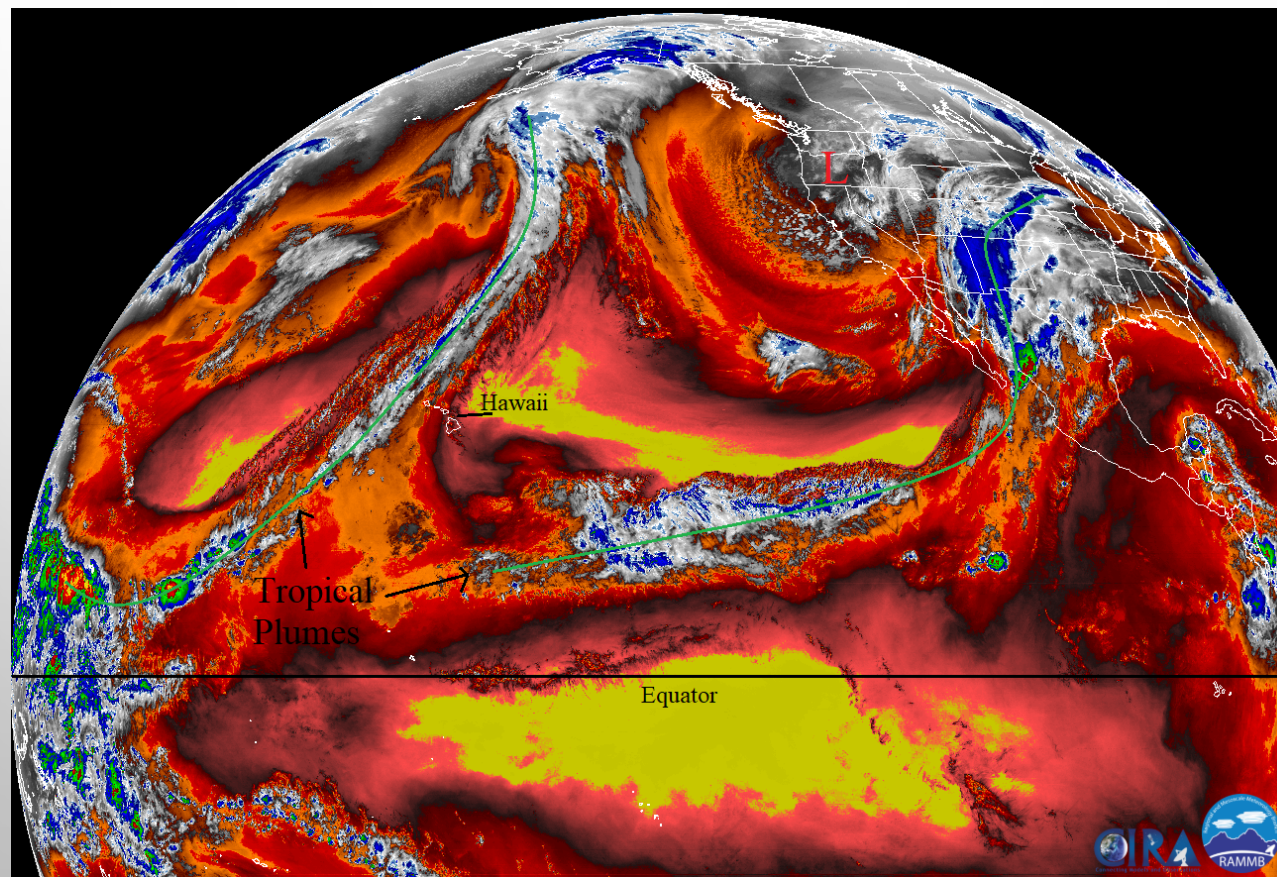


The mean change in temperature (left) and precipitation (right) September – November, 1974-1994 versus 1994-2014. No surprise - warmer, wetter falls in many areas.

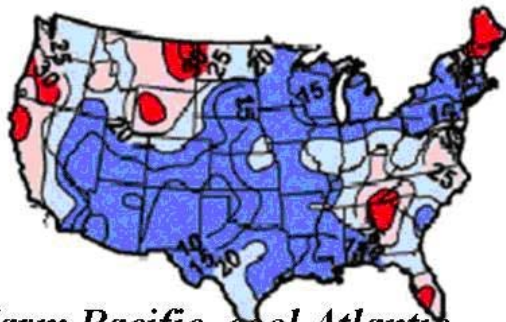
NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 11/28/2019
(white regions indicate sea-ice)



ATMOSPHERIC RIVERS



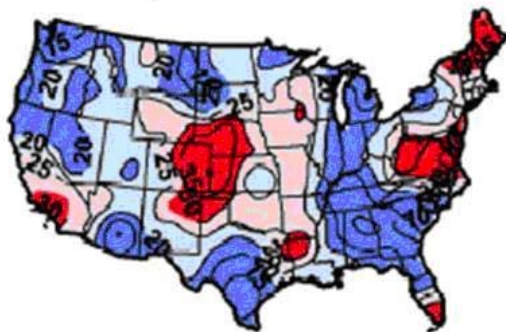
LONG TERM WET / DRY PATTERNS & PDO/AMO



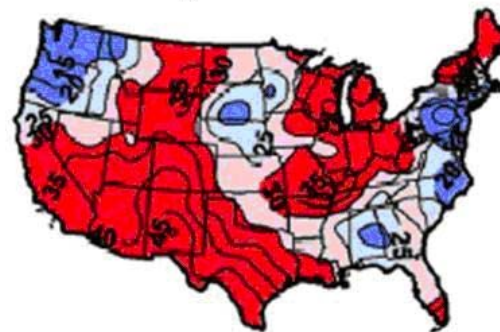
Warm Pacific, cool Atlantic.



Warm Pacific, warm Atlantic.



Cool Pacific, cool Atlantic.

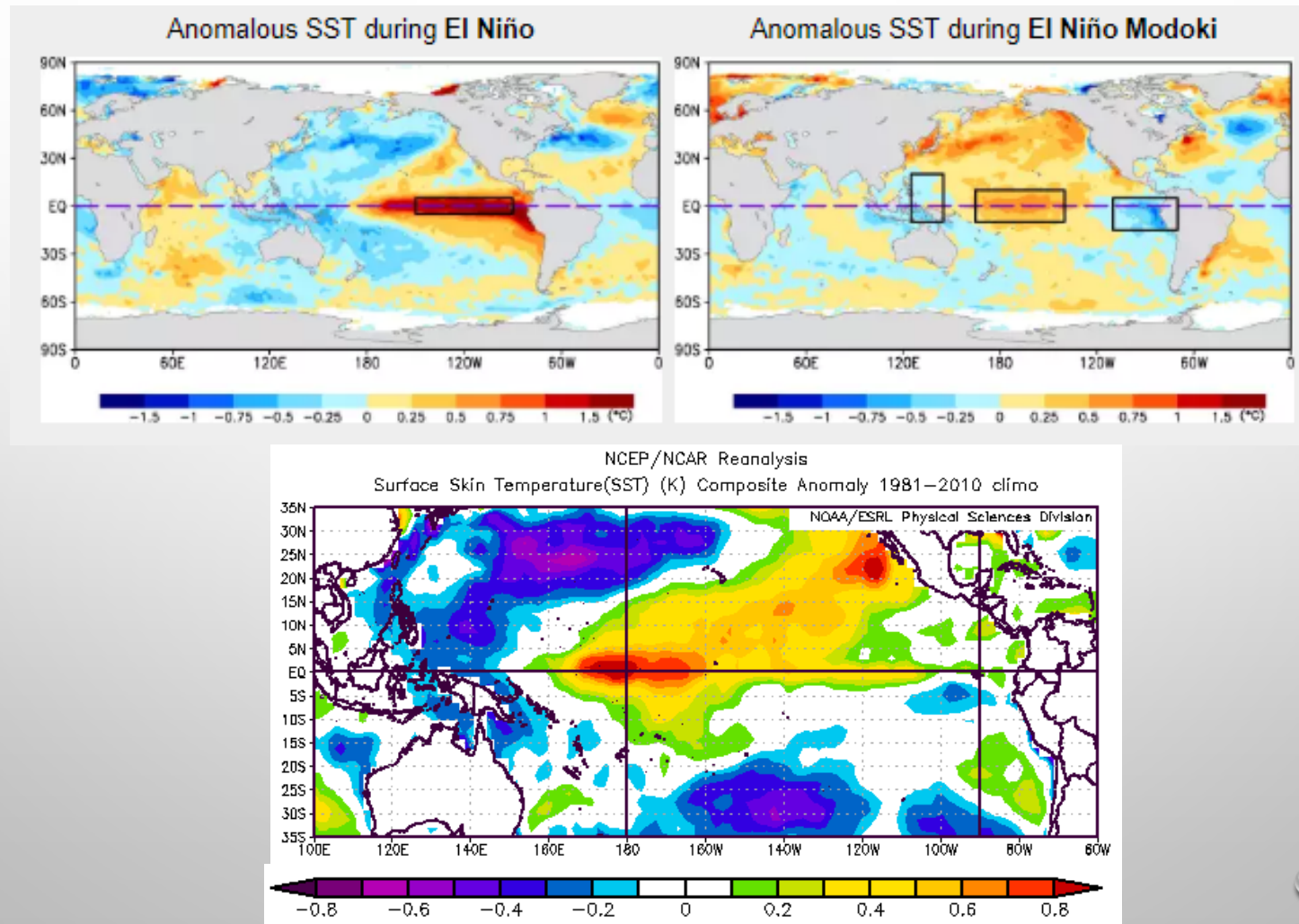


Cool Pacific, warm Atlantic

Drought frequency (in percent of years)

Pacific and Atlantic Ocean Influences on Multidecadal Drought Frequency in the United States, Gregory J. McCabe, Michael A. Palecki, and Julio L. Betancourt

MODOKI EL NINO

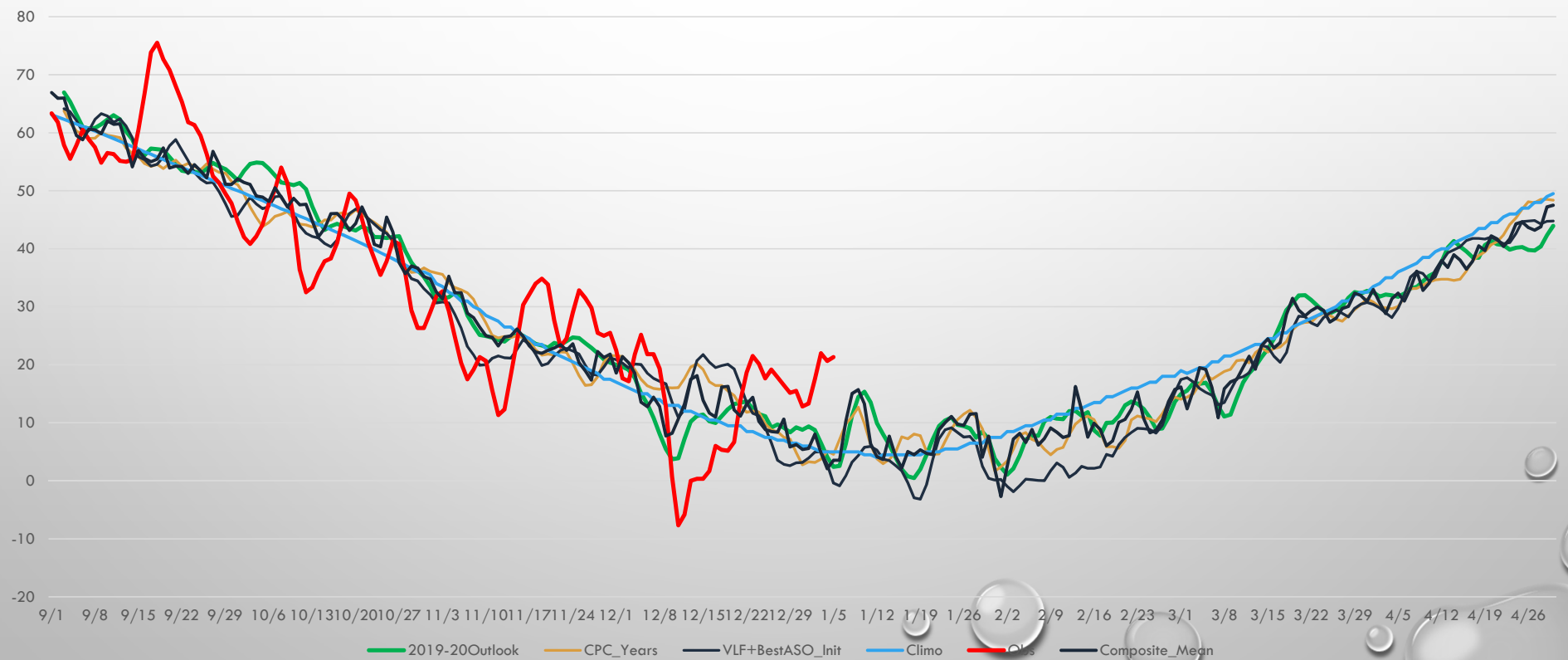


THE 2020 COMPOSITE OUTLOOK ASSUMPTIONS

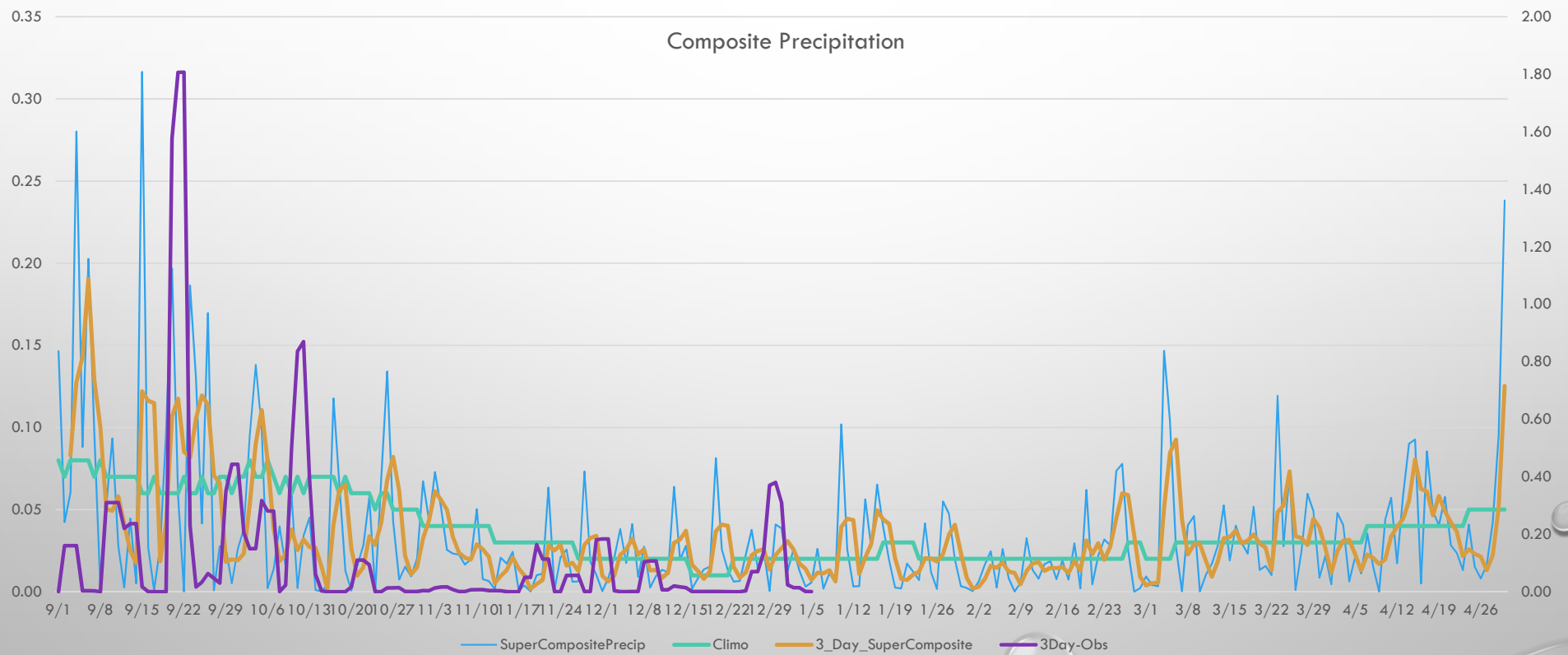
- A WARM NEUTRAL MODOKI ENSO IS ANTICIPATED TO PERSIST THROUGH MUCH OF 2020 WINTER AND SPRING. THE PDO TENDS TO FORCE MORE COLD DAYS THAN WARM, AS RECENT VARIABILITY SUPPORTS
- ENSO IMPACTS ARE MAXIMIZED IN THE WINTER & SPRING, THE BASIC ASSUMPTION THAT A NEGATIVE PDO AND WARM ENSO WILL 'DESTRUCTIVELY INTERACT' RESULTING IN NON-STANDARD WEATHER WITH WIDE VARIABILITY ESPECIALLY IN TEMPERATURE.
- JANUARY - MARCH GENERALLY COLDER AND WETTER MOST AREAS, AS SEEN WITH RECENT VARIABILITY. AN OVERALL DRIER FEBRUARY TRANSITIONS TO SEVERAL MARCH STORMS FOR ABOVE MEDIAN RAIN/SNOW.
- APRIL SUGGESTS A NORTHWARD SHIFT BUT A DECREASE IN THE PRECIPITATION, WITH A RETURN TO WETTER THAN MEDIAN AS WE ENTER MAY.
- WE SHOULD SEE AN EARLY PEAK IN SUMMER RAINS WITH MORE NORMAL PRECIPITATION INTO JULY. LOCALIZED EXCESSIVE RAINS A HIGHER RISK AS WITH RECENT SUMMERS. LATE SUMMER INTO THE EARLY FALL [JULY – SEPTEMBER]

TEMPERATURE ANALOG TRACES

3 Day RM Composite Temperatures

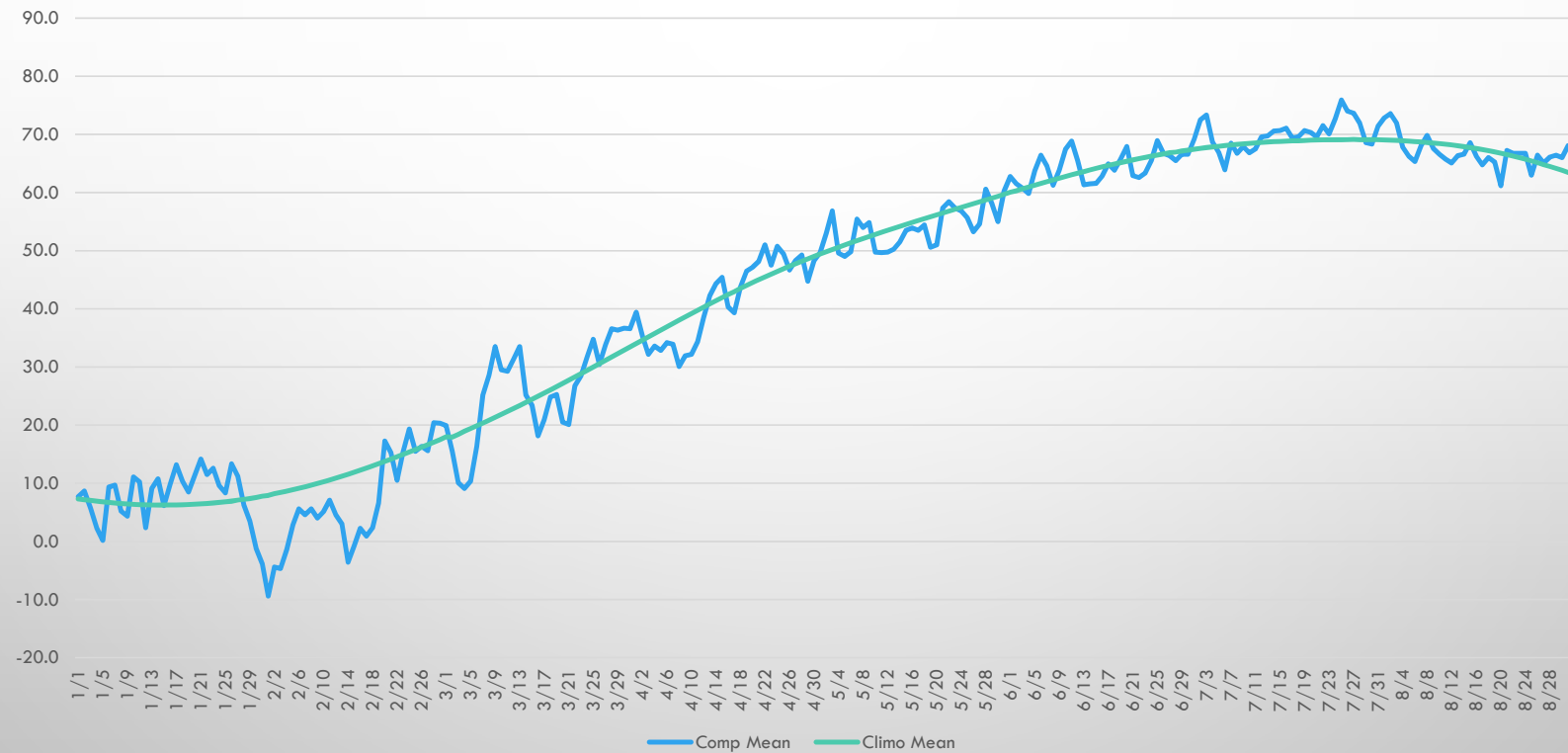


PRECIPITATION ANALOG TRACES



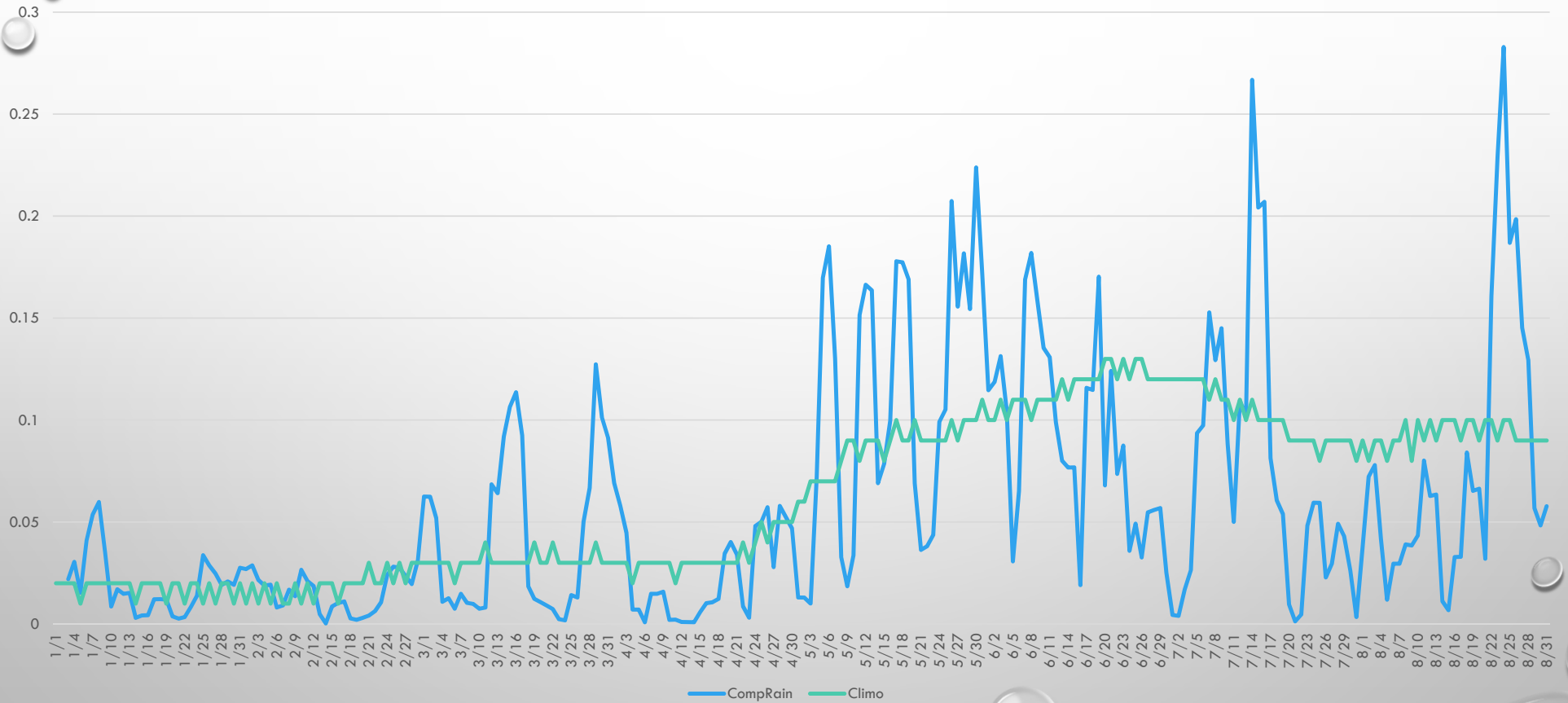
January – August Composite Temperature

Composite Means - Temperature

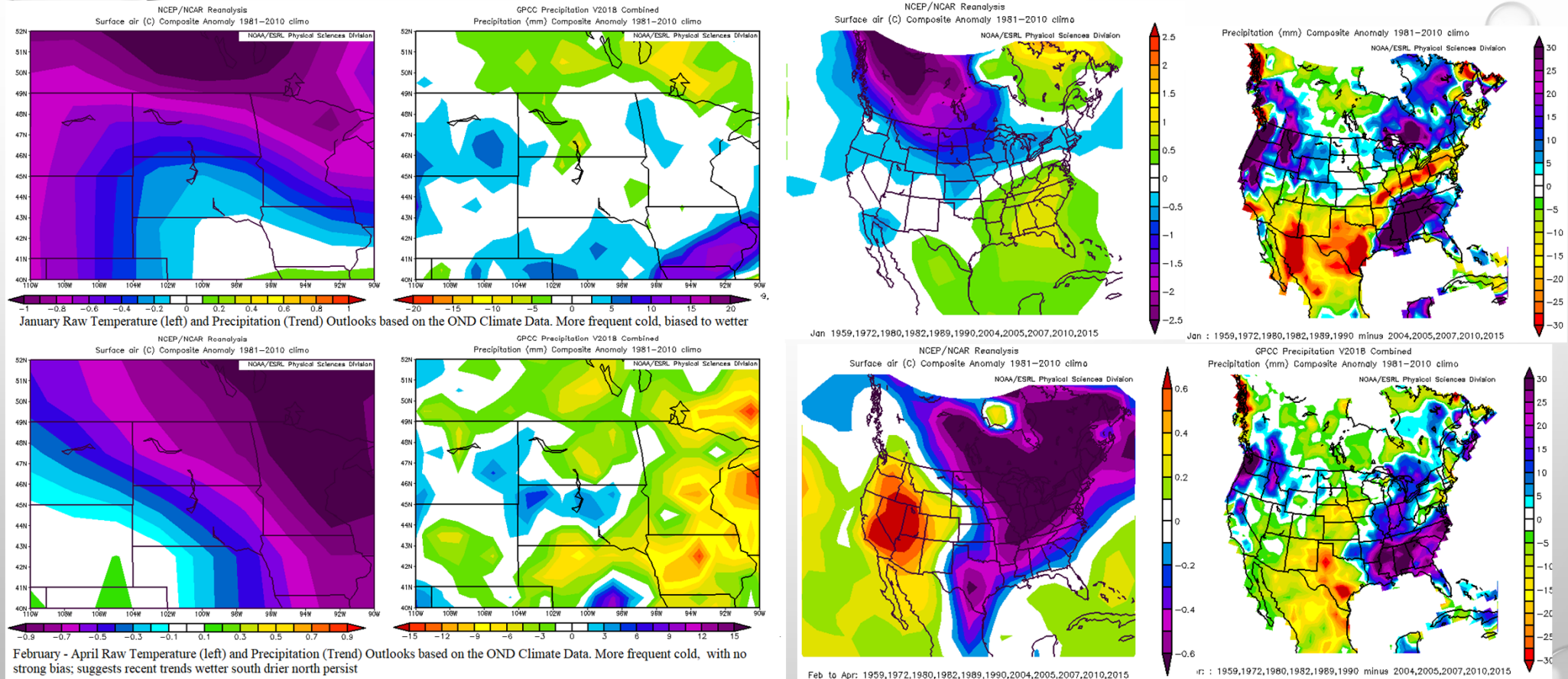


January – August Composite Precipitation

Composite Means - Precipitation

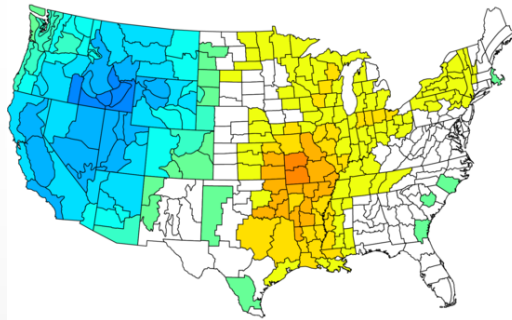


CURRENT OUTLOOKS

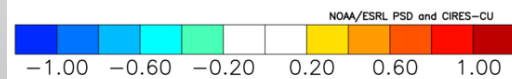
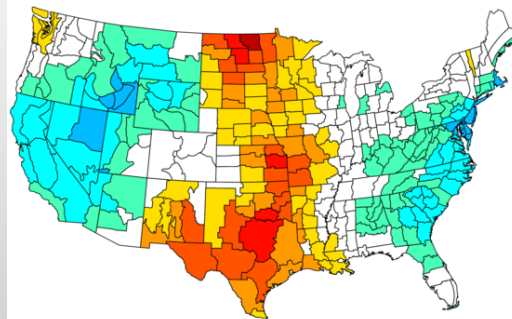


The January (top) February – April Temperature and Precipitation Outlooks suggest dominant cold and more frequent precipitation patterns

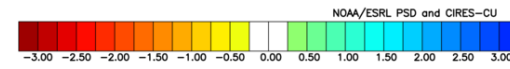
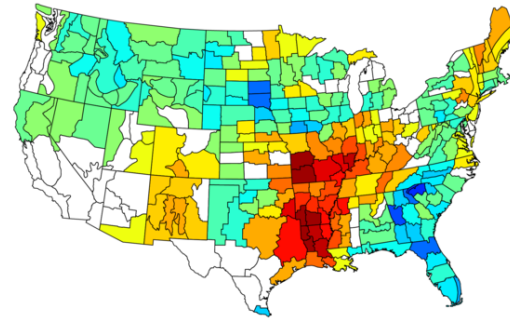
NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
May to Jul 1972,1980,1982,2005,2010
Versus 1981–2010 Longterm Average



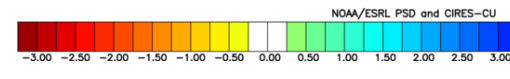
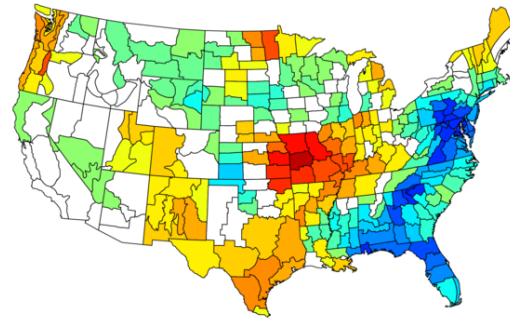
NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
May to Jul 1972,1980,1982,2005,1978,1989,1990,2018
Versus 1981–2010 Longterm Average



NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
May to Jul 1972,1980,1982,2005,2010
Versus 1981–2010 Longterm Average

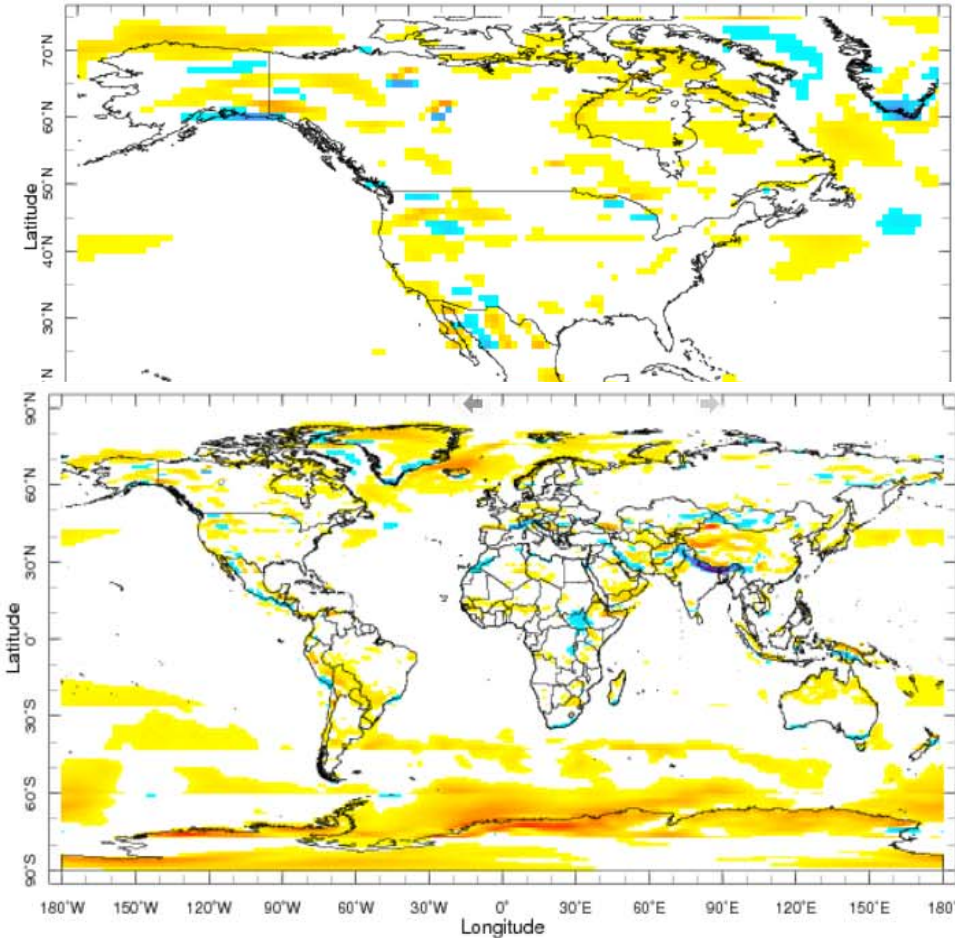


NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
May to Jul 1972,1980,1982,2005,1978,1989,1990,2018
Versus 1981–2010 Longterm Average

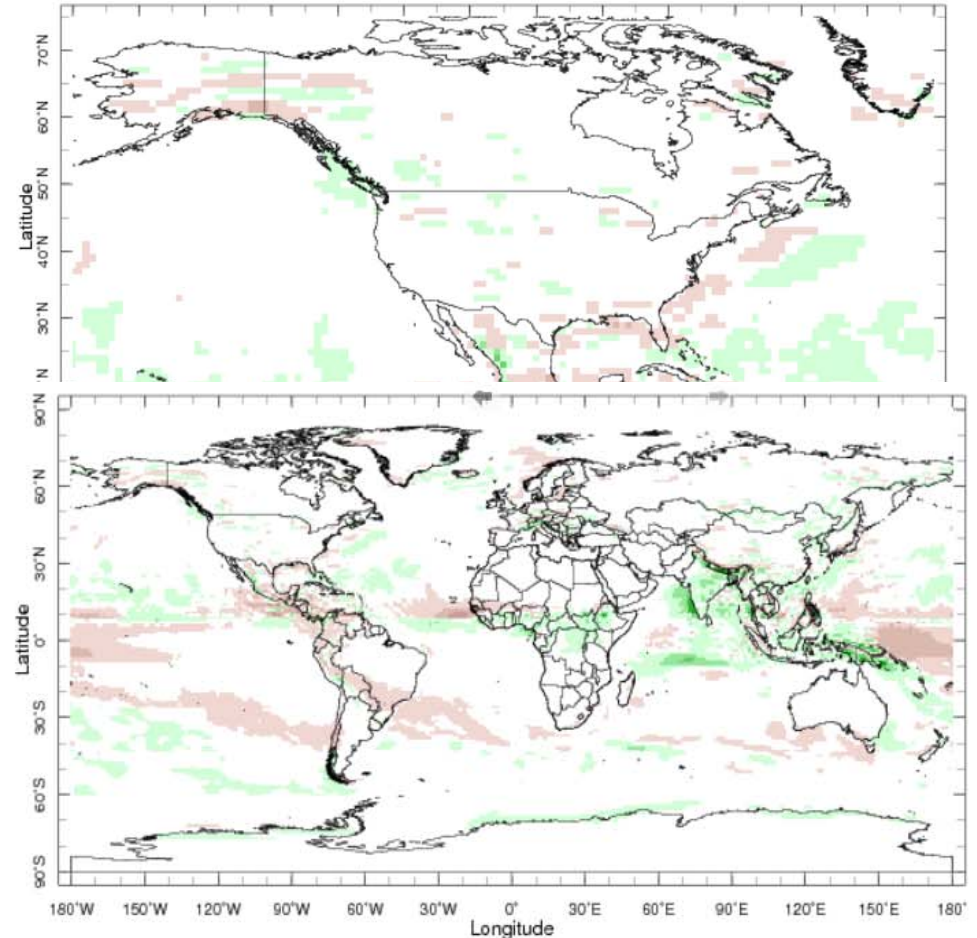


The May to July Temperature and Precipitation Outlooks (ENSO+OND) suggest a turn towards warmer and drier at least to start the growing season.

JULY – SEPTEMBER 2020



Forecast Anomaly for Jul-Sep 2020 for Forecast Issued 0000 1 Jan 2020 from CFSv2



Forecast Anomaly for Jul-Sep 2020 for Forecast Issued 0000 1 Jan 2020 from CFSv2

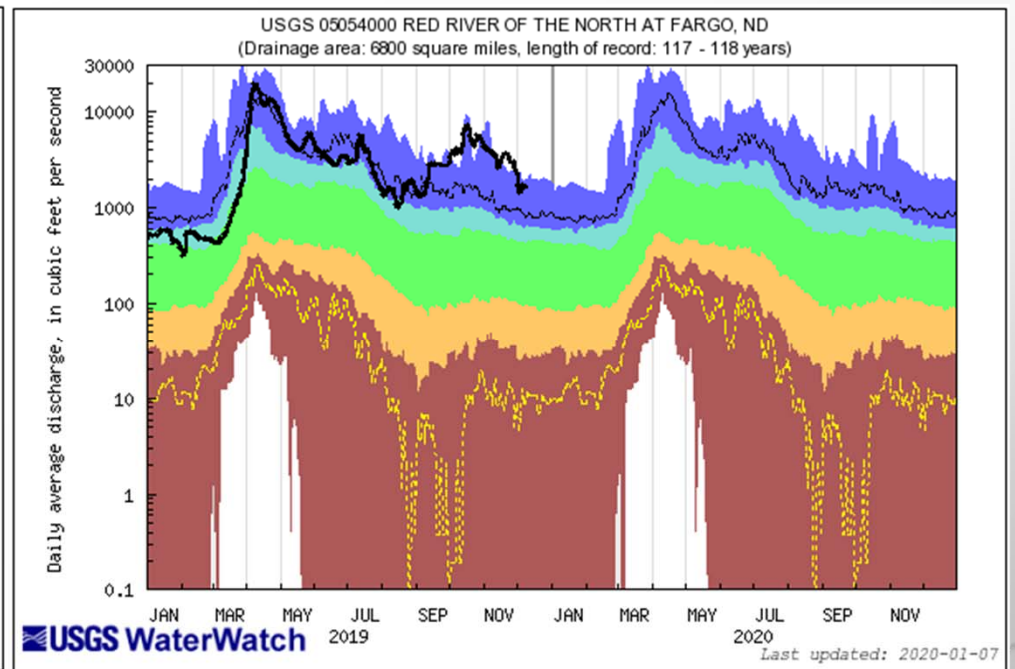
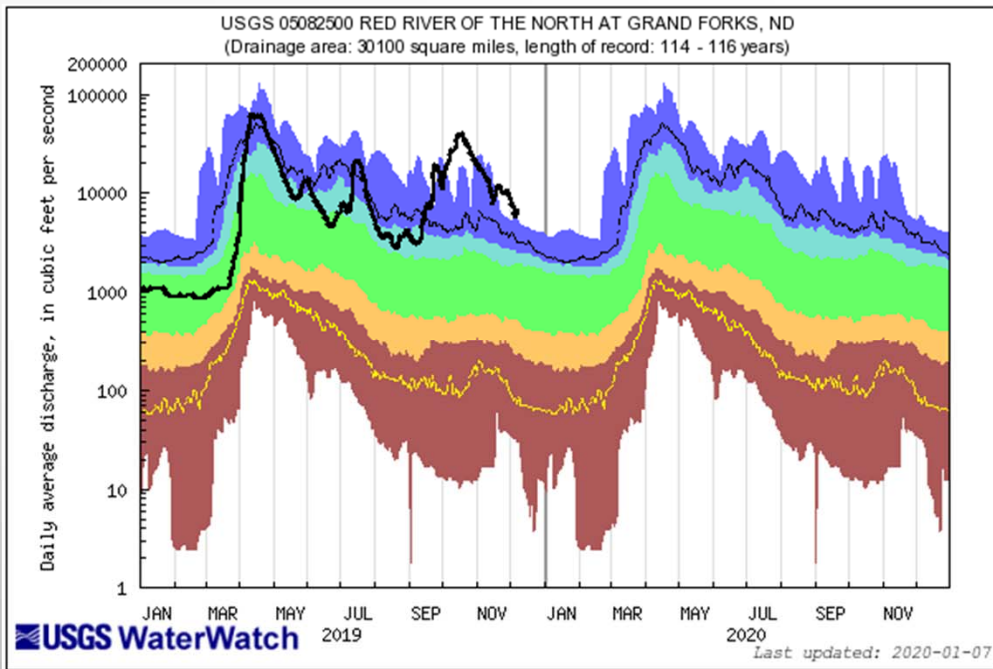
- UNTIL WE SEE A CHANGE IN THE CURRENT PACIFIC / NORTH ATLANTIC TEMPERATURE DISTRIBUTIONS THE BROADLY WETTER PATTERN SHOULD REMAIN.



SPRING FLOOD IMPLICATIONS

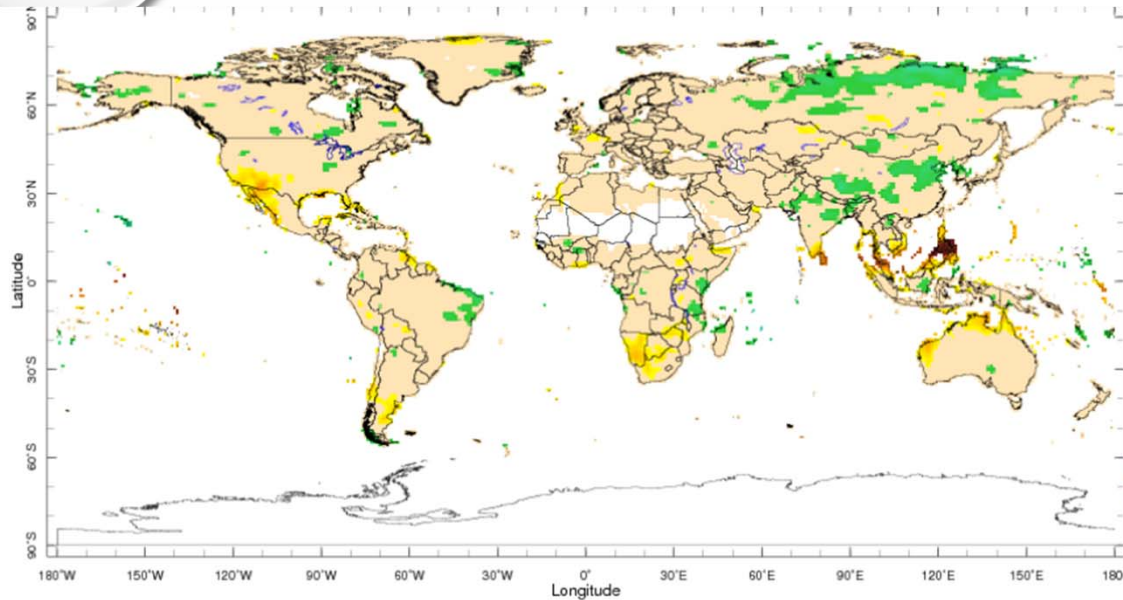
- 1. THE FREEZE/MELT CYCLE
 - 2. EARLY SPRING RAINS WHICH INCREASE MELTING OF THE SNOWPACK OR LATE SPRING SNOWSTORMS ADDING TO THE EXISTING SNOWPACK
 - 3. THE ACTUAL SNOWPACK DEPTH AND WATER EQUIVALENCY
 - 4. FROST DEPTH
 - 5. SOIL MOISTURE CONTENT
 - 6. RIVER ICE CONDITIONS
 - STATISTICALLY / HISTORICALLY THERE IS NO REAL CORRELATION BETWEEN THE FALL PRECIPITATION AND NEXT SPRINGS FLOOD.
- 

WHERE ARE WE NOW

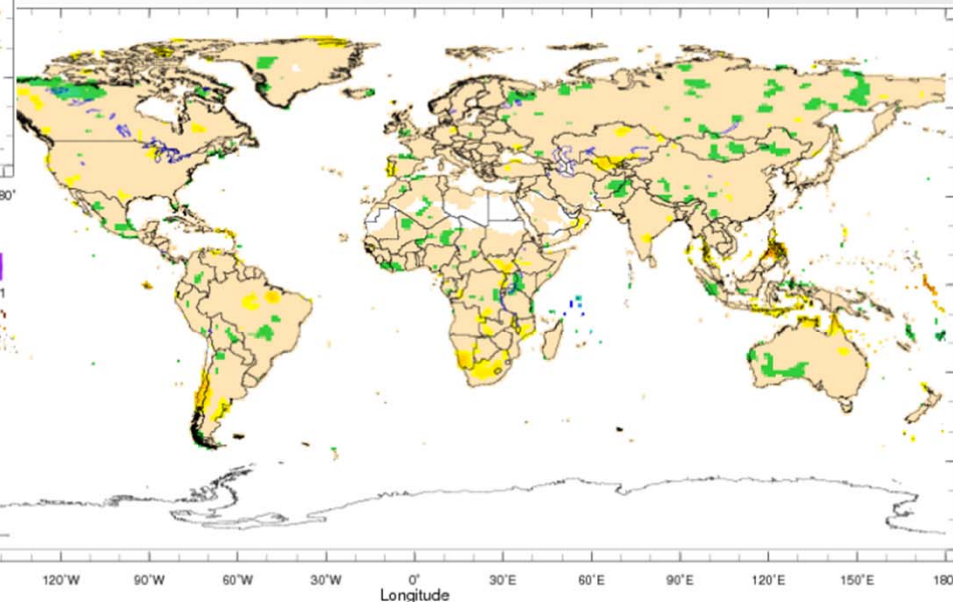


USGS Streamflow Duration Hydrograph Builder <https://waterwatch.usgs.gov/index.php?id=sitedur>

GLOBAL DROUGHT OUTLOOKS



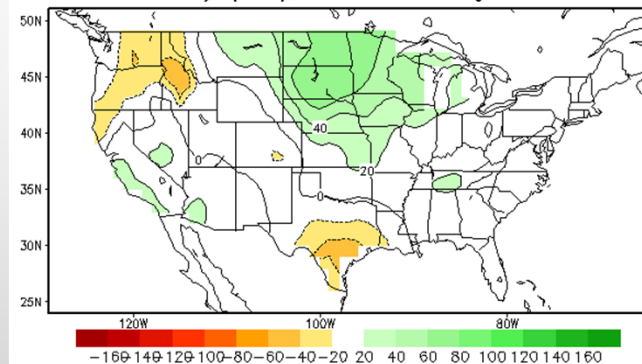
- Australian drought to show little relief, except for portions of the southwest
- South African regions remain dry while excessive rains fall over the Equatorial Regions
- Little change expected through January across the South American Continent



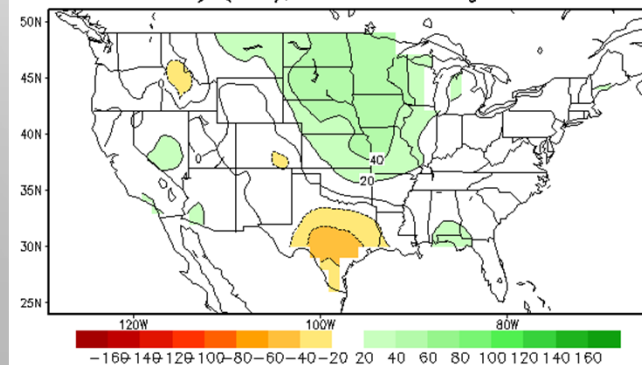
- The Canadian drought areas show little improvement while winter moisture falls across southern Alberta, Saskatchewan and Manitoba
- Southern / western US Plains drought persists or intensifies as northern US wet persists

MISCELLANY

Lagged Averaged Soil Moisture Outlook for End of FEB2020
units: anomaly (mm), SM data ending at 20200106



Lagged Averaged Soil Moisture Outlook for End of APR2020
units: anomaly (mm), SM data ending at 20200106



North American Drought Monitor November 30, 2019

Released: Friday, December 13, 2019

<http://www.ncdc.noaa.gov/temp-and-precip/drought/nadm>

Analysts:
Canada - Trevor Hadwen
Laura Richard
Mexico - Minerva Lopez
Yenifer Loranca
U.S.A. - Deborah Bathke
Jessica Blunden*

* Responsible for collecting analysts' input & assembling the NADM map

Intensity

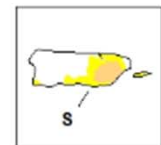
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)



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



Regions in northern Canada may not be as accurate as other regions due to limited information.

RECAP & CAVEAT

- JANUARY - FEBRUARY GENERALLY COLDER; NORMAL CLIMATOLOGICAL VARIABILITY CONSISTENT WITH RECENT PATTERS. ODD FAVOR AN OVERALL DRIER FEBRUARY TRANSITIONS TO SEVERAL MARCH STORMS FOR ABOVE MEDIAN RAIN/SNOW.
- APRIL SUGGESTS A NORTHWARD SHIFT IN THE PRECIPITATION AXIS WITH A DECREASE IN THE PRECIPITATION, WITH A RETURN TO WETTER THAN MEDIAN LATER APRIL INTO MAY.
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- THE RISK FOR A LATE HARD FREEZE/FROST IS HIGHER.
- THERE LOOKS TO BE A PERIOD OF WARMER DRIER WEATHER FAVORABLE FOR PLANTING PATTERN BASED ON MODOKI EL NIÑO & TRENDS
- FOR SUMMER, GREATER VARIABILITY WITH A SEASONALLY NORMAL' FAVORING THE COOL SIDE OF NORMAL. PRECIPITATION WILL SHOW THE USUAL SHOWER / T-STORM PRECIPITATION DISTRIBUTION ISSUES EXIST.
- THE RISK FOR WIDESPREAD OR SIGNIFICANT DROUGHT IS LOW IN MOST AREAS. THERE ARE SOME SUGGESTIONS THAT THE INTERNATIONAL BORDER REGIONS MAY BE MOST AT RISK EARLY AND THE SOUTHERN BORDER LATER.

Q & A



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GOOGLE BUSINESS

[HTTPS://HOME-ON-THE-PRAIRIE-WEATHER.BUSINESS.SITE/?M=TRUE](https://home-on-the-prairie-weather.business.site/?m=true)