

Winter Grain Market and Climate Outlook Meetings

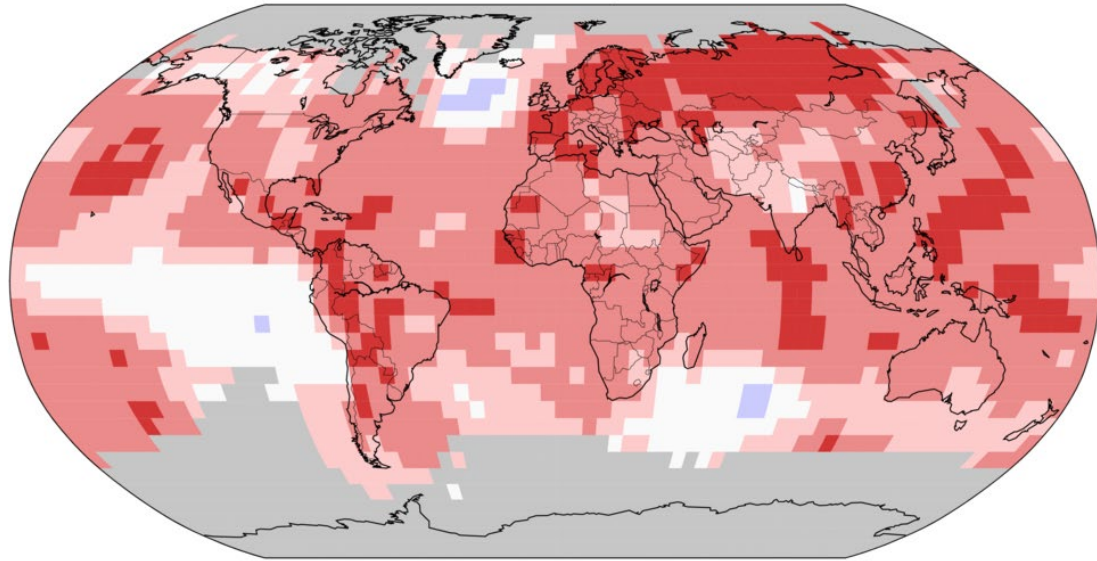
January 22, 2021

**Ben Brown & Aaron Wilson
University of Missouri/The Ohio State University**

Photo Courtesy of Mary Griffith

GLOBAL ASSESSMENT

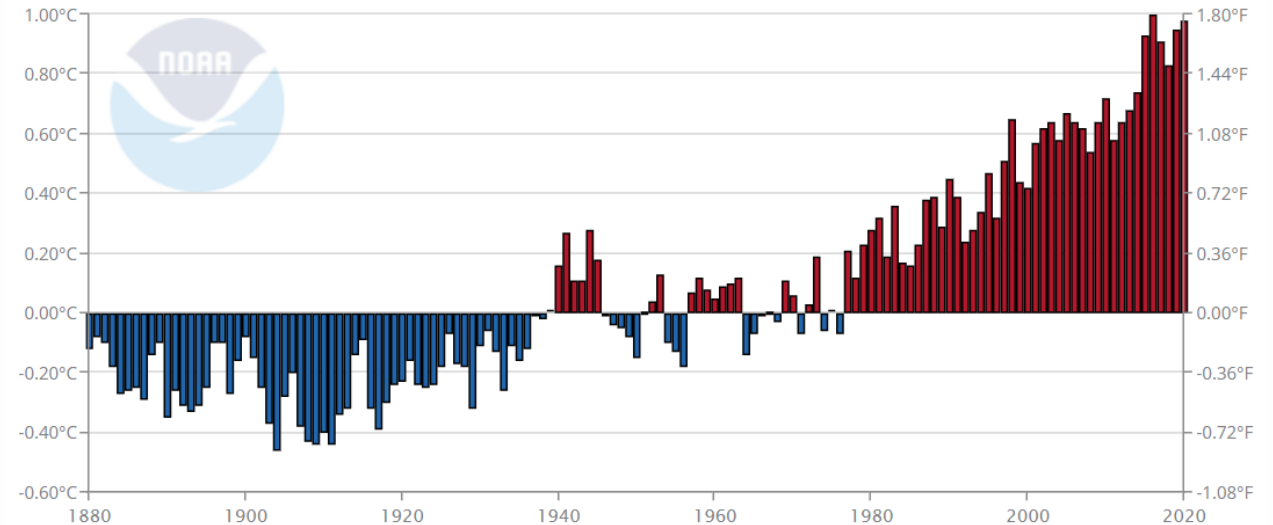
Land & Ocean Temperature Percentiles Jan–Dec 2020
NOAA's National Centers for Environmental Information
Data Source: NOAAGlobalTemp v5.0.0–20210106



Record Coldest Much Cooler than Average Cooler than Average Near Average Warmer than Average Much Warmer than Average Record Warmest

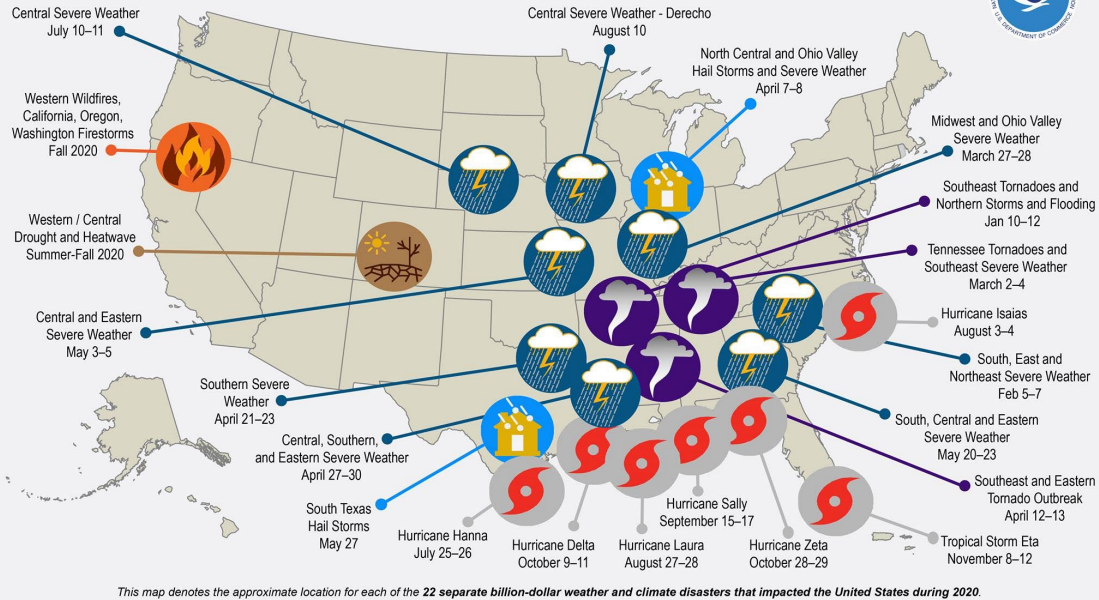
GHCNM v4.0.1.20210105.q1e

Global Land and Ocean
January–December Temperature Anomalies

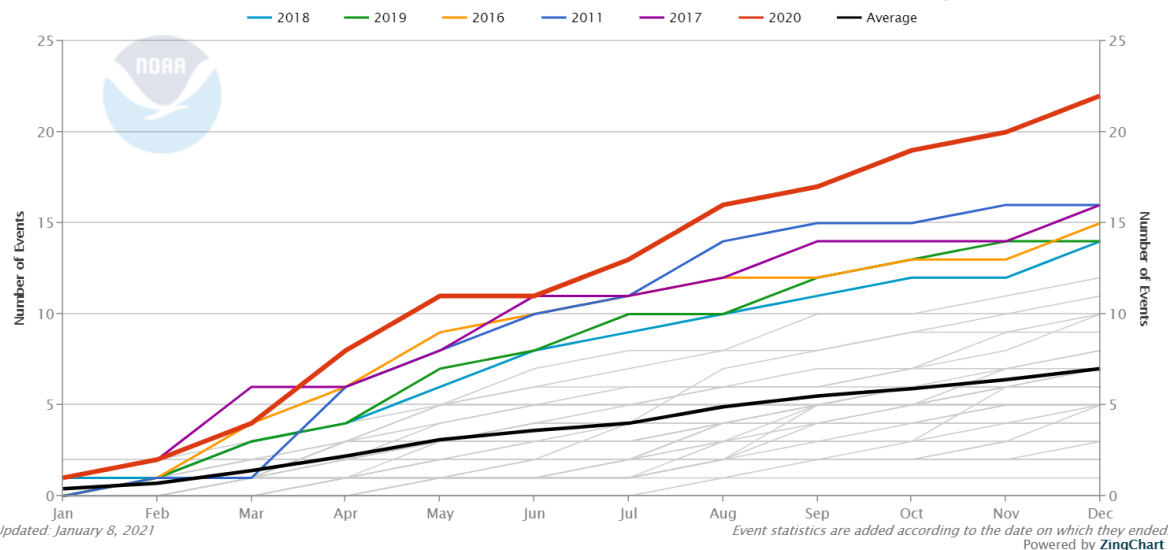


- 2020 is now 2nd Warmest since 1880 (behind 2016 by 0.04 deg F); 2019 is 3rd warmest
- Top 10 warmest years have occurred since 2005
- If you were born after February 1985, you have never experienced a cooler than average month for the planet!

U.S. 2020 Billion-Dollar Weather and Climate Disasters



1980–2020 Year-to-Date United States Billion-Dollar Disaster Event Count (CPI-Adjusted)



BILLION DOLLAR DISASTERS



National Weather Service Mission



2008-2017 Natural Disasters in Ohio

- Flash flooding: \$178,548,000
- Flooding: \$54,551,000
- Hurricanes: \$0
- Heavy rain: \$126,000
- Heavy snow: \$4,860,000
- Tornadoes: \$196,559,000
- Tsunamis: \$0
- Wildfires: \$0
- >\$200 million on rain related disasters



<https://www.ncdc.noaa.gov/billions/>



Building a Weather-Ready Nation

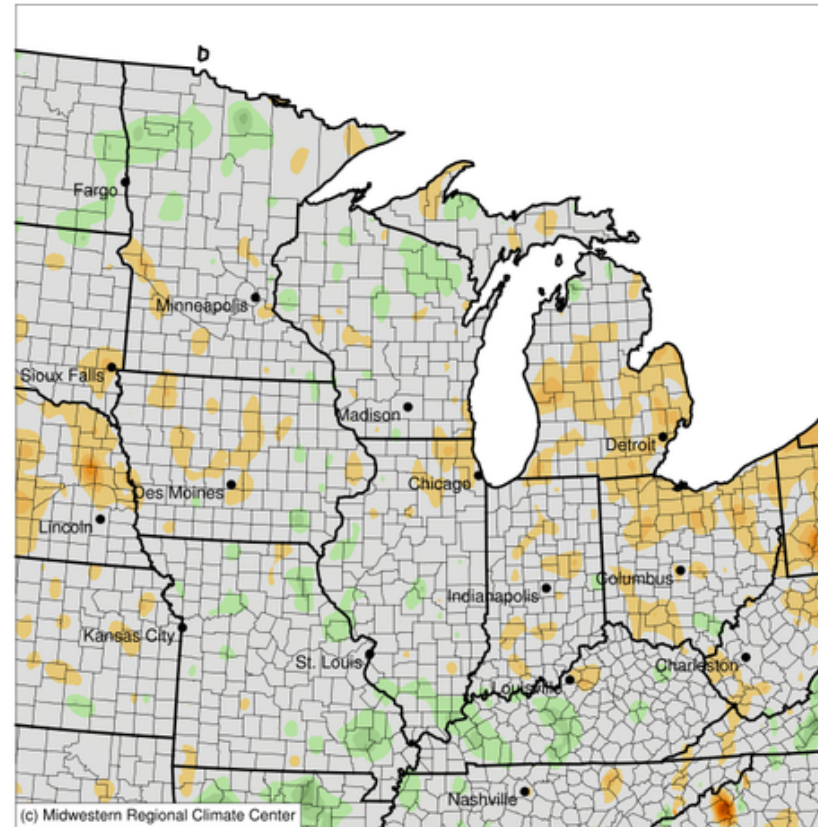
CFAES

Average Maximum Temperature (°F): Departure from 1981-2010 Normals

March 01, 2020 to November 30, 2020

2020 Midwest
Growing Season
Climate

- Warmer than average across Ohio/Michigan back through Iowa
- Hot summer (July)

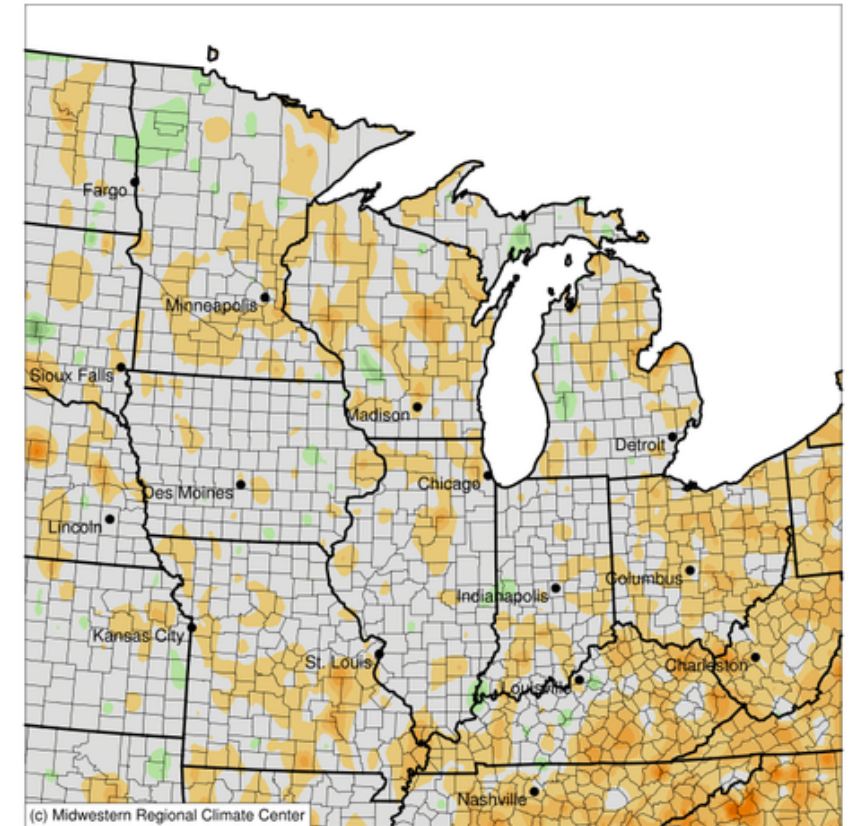


-5 0 5 10

Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet, Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/3/2021 8:17:28 AM CST

Average Minimum Temperature (°F): Departure from 1981-2010 Normals

March 01, 2020 to November 30, 2020



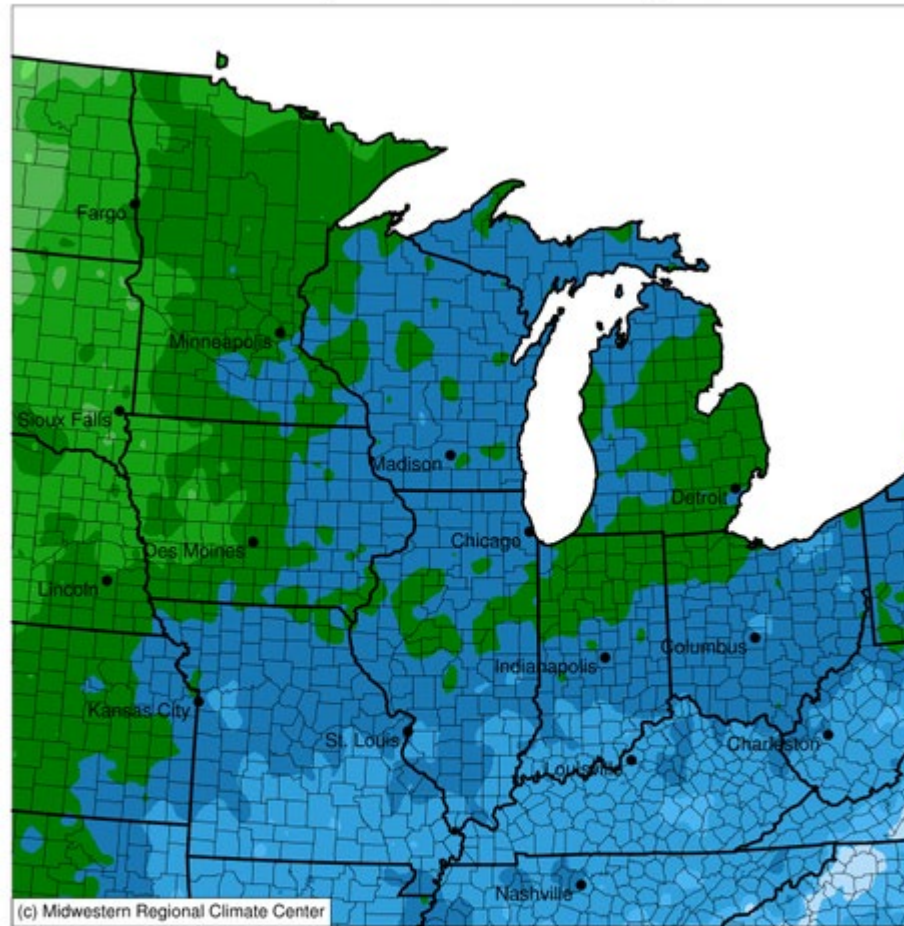
-6 -1 4

Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet, Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/3/2021 8:13:36 AM CST

2020 Midwest Growing Season Climate

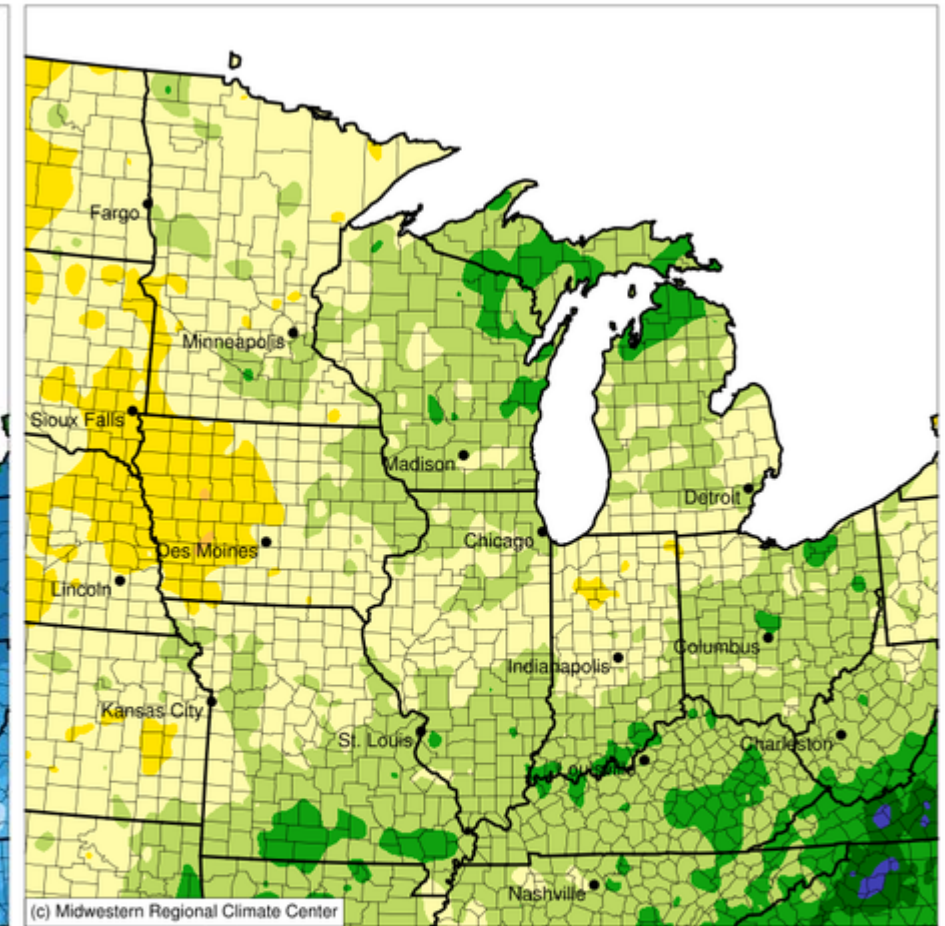
- Precipitation deficits from Great Plains, through Iowa, N. Missouri, Central Illinois, N. Indiana, and N. Ohio

Accumulated Precipitation (in)
March 01, 2020 to November 30, 2020



0.01 1 2.5 5 7.5 10 15 20 30 40 50 60 80
Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet, Midwest Regional Climate Center
cli-MATE: MRCC Application Tools Environment
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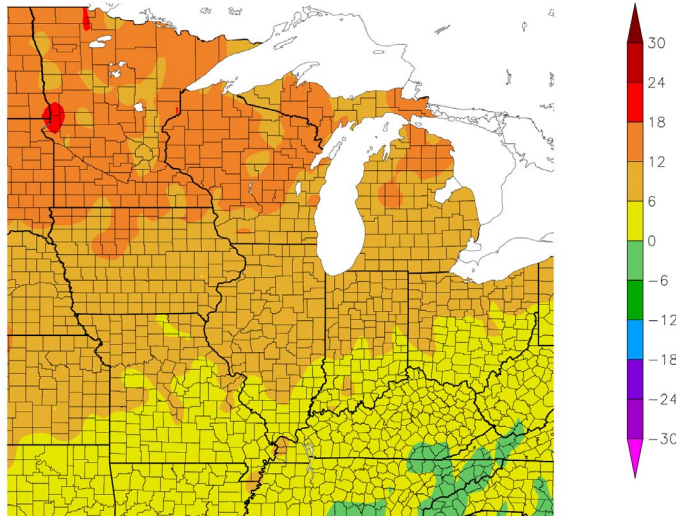
Accumulated Precipitation (in): Percent of 1981-2010 Normals
March 01, 2020 to November 30, 2020



50 75 100 125 150 175
Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Missouri FSA, Missouri Mesonet, Midwest Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/4/2021 5:07:25 AM CST

Temperature Differences Compared to Average (1981-2010)

Departure from Normal Temperature (F)
1/13/2021 – 1/19/2021



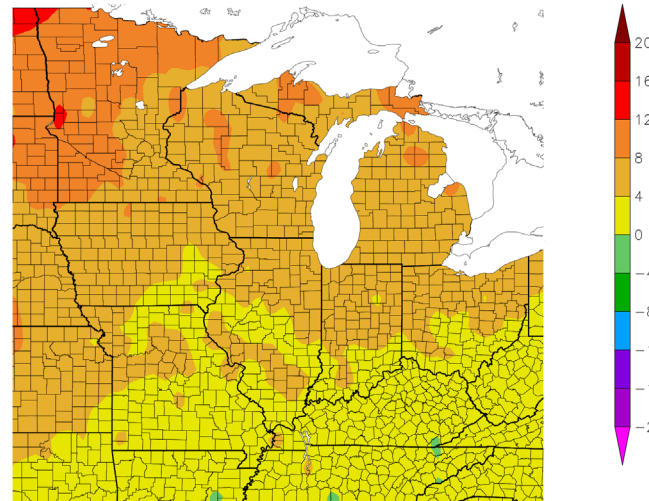
Generated 1/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

7-Day

30-Day

Departure from Normal Temperature (F)
12/21/2020 – 1/19/2021

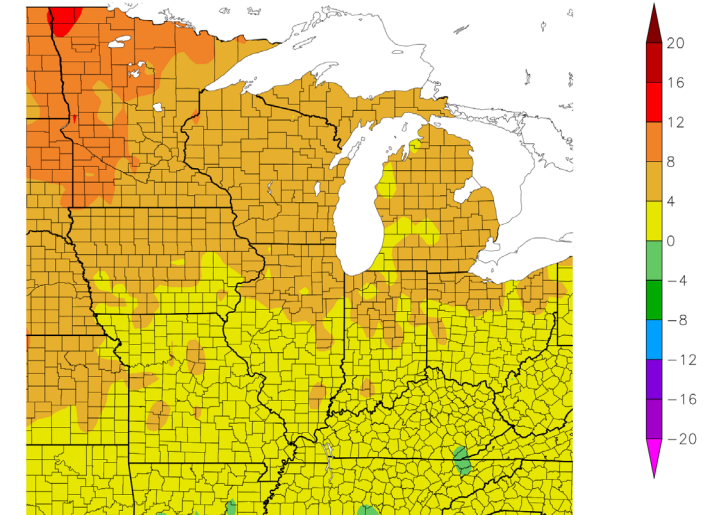


Generated 1/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

60-Day

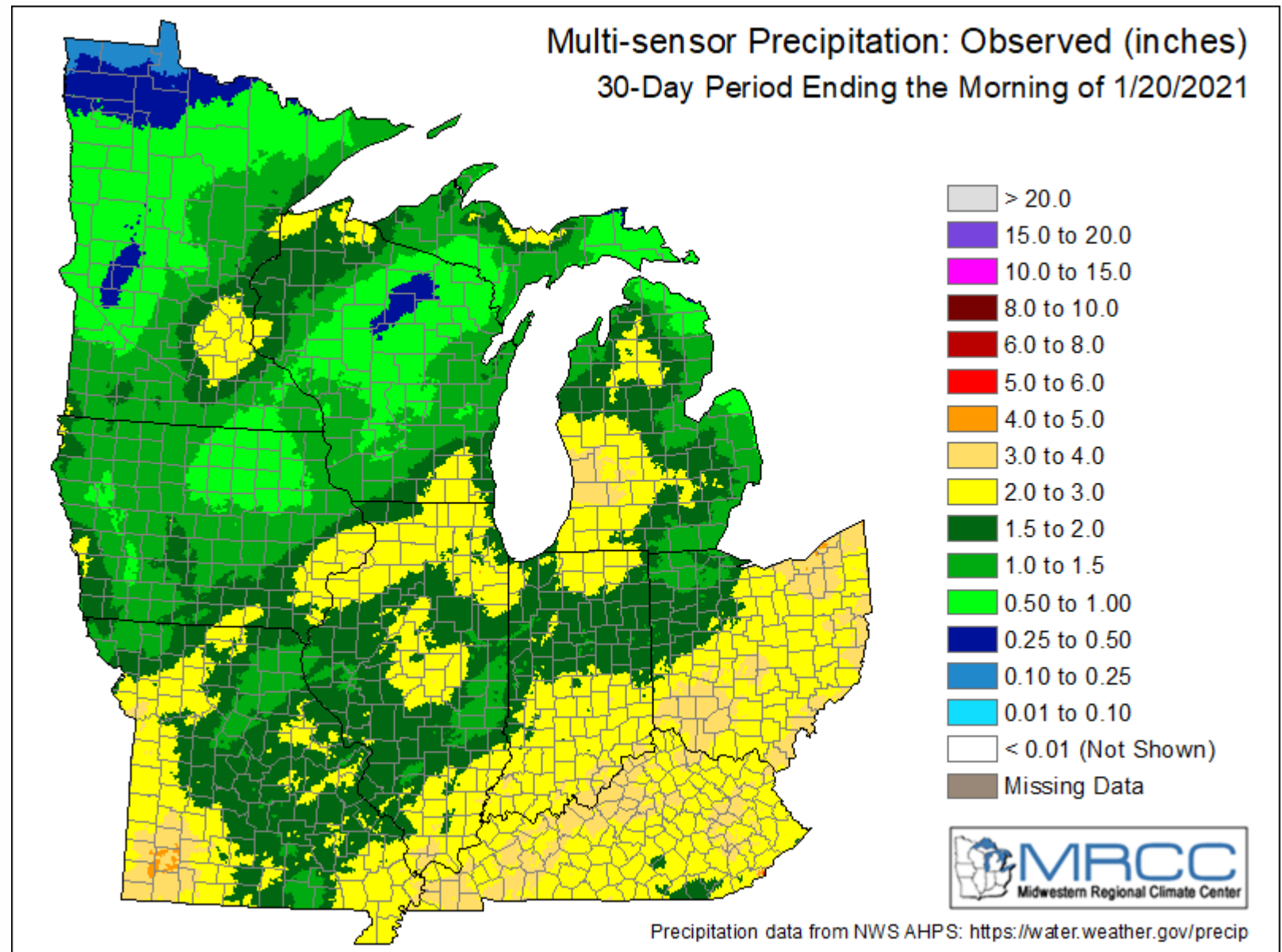
Departure from Normal Temperature (F)
11/21/2020 – 1/19/2021



1/20/2021 at HPRCC using provisional data.

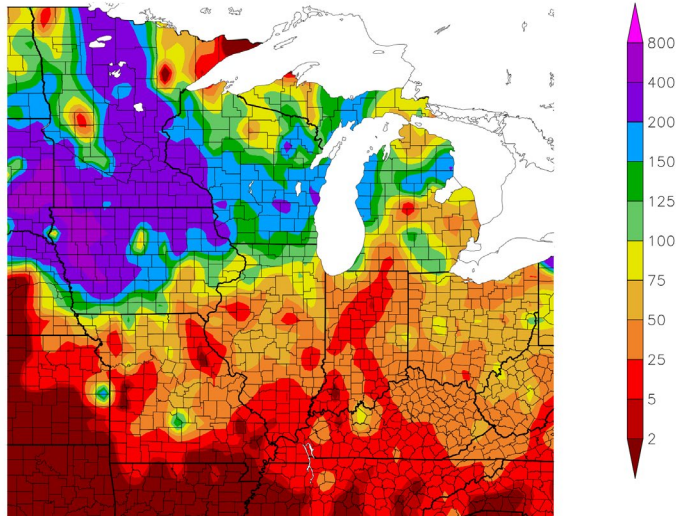
NOAA Regional Climate Centers

Previous 30-day Precipitation



Precipitation Differences Compared to Average (1981-2010)

Percent of Normal Precipitation (%)
1/13/2021 – 1/19/2021



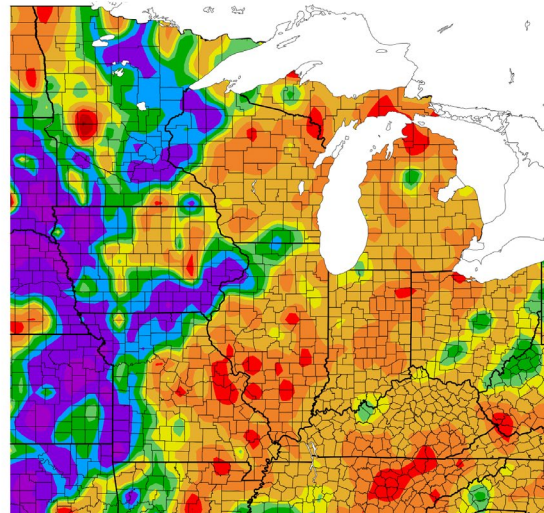
Generated 1/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

7-Day

30-Day

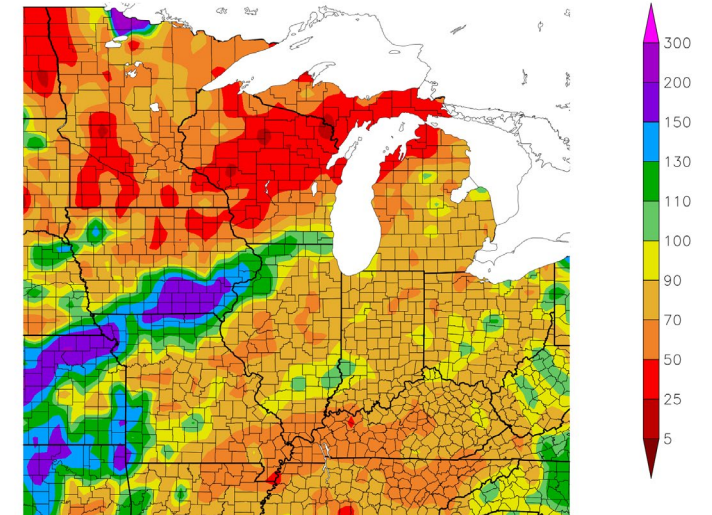
Percent of Normal Precipitation (%)
12/21/2020 – 1/19/2021



Generated 1/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
11/21/2020 – 1/19/2021



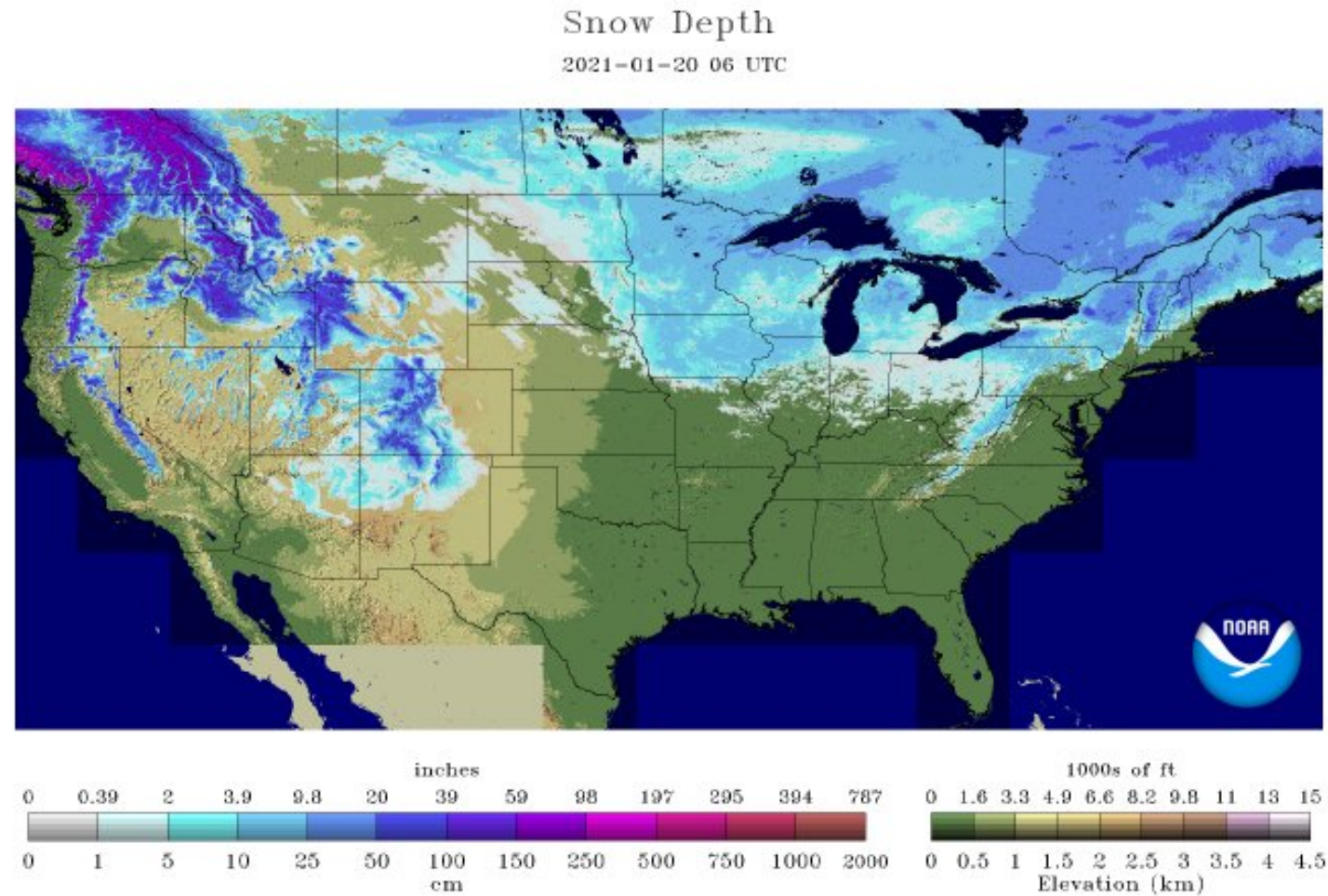
/20/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

60-Day

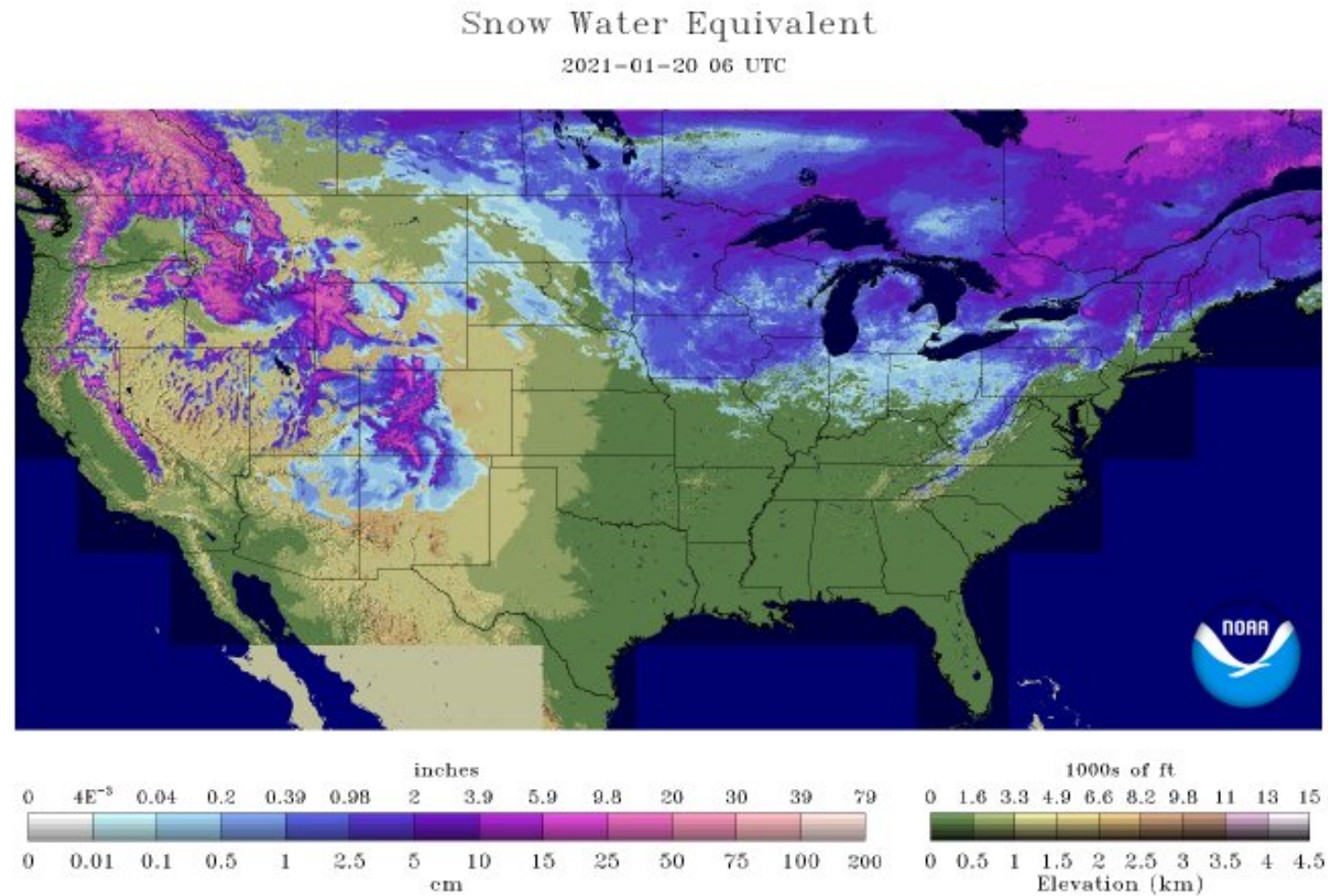
Snow Analysis

National Snow 2020-
Analysis 2021
OWP OFFICE OF
WATER
PREDICTION



<https://www.nohrsc.noaa.gov/nsa/>

Snow Analysis



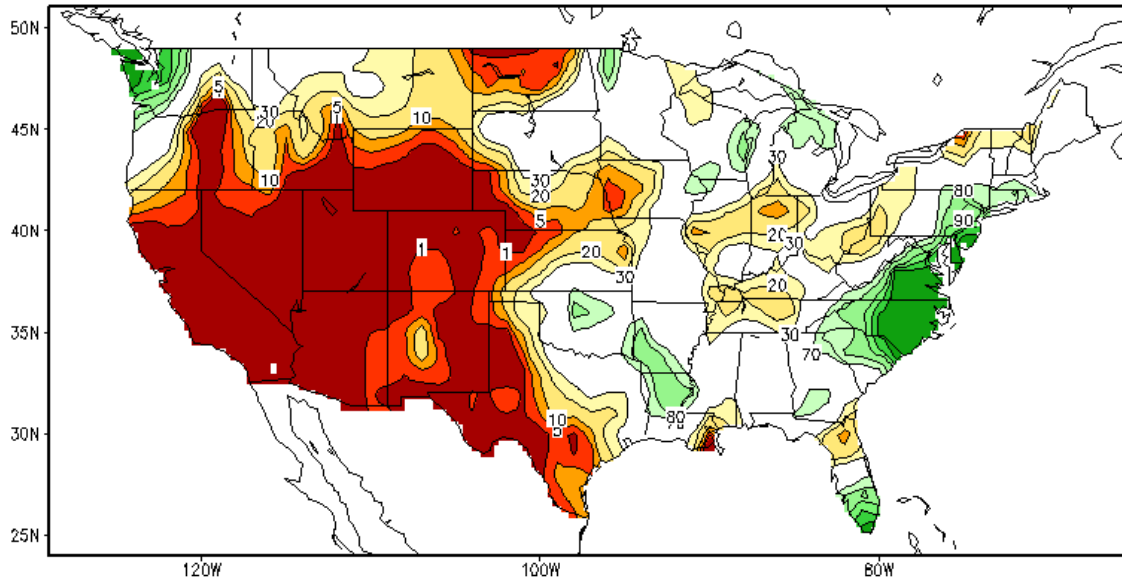
<https://www.nohrsc.noaa.gov/nsa/>

Current Soil Moisture

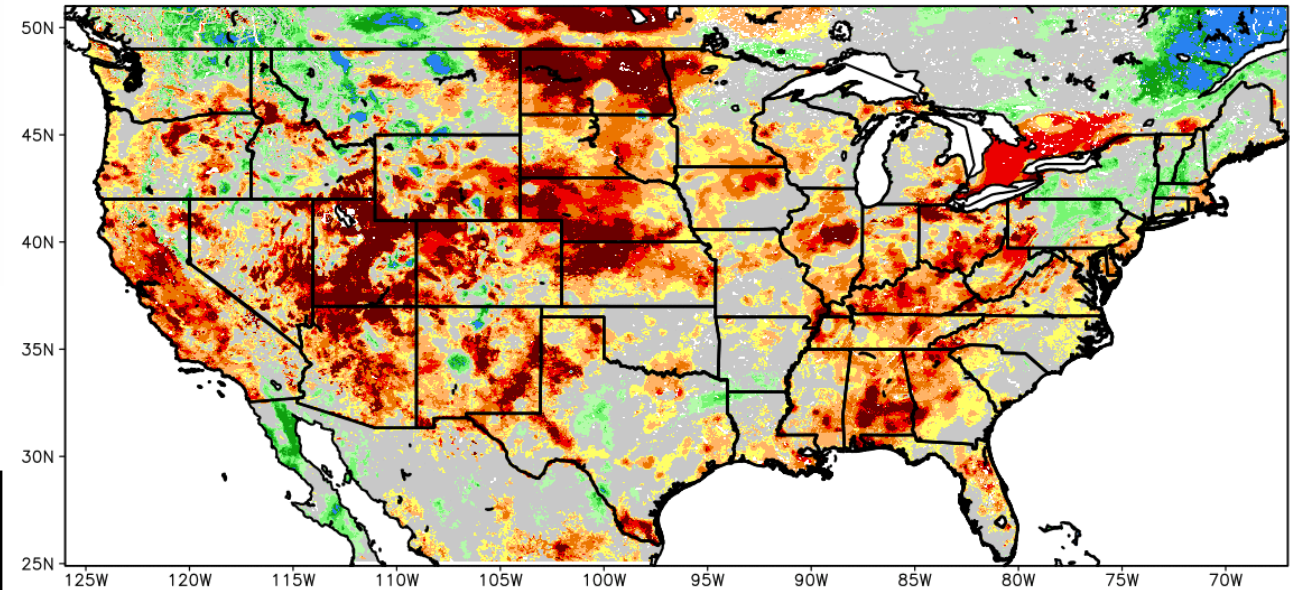


https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

Calculated Soil Moisture Ranking Percentile
JAN 19, 2021



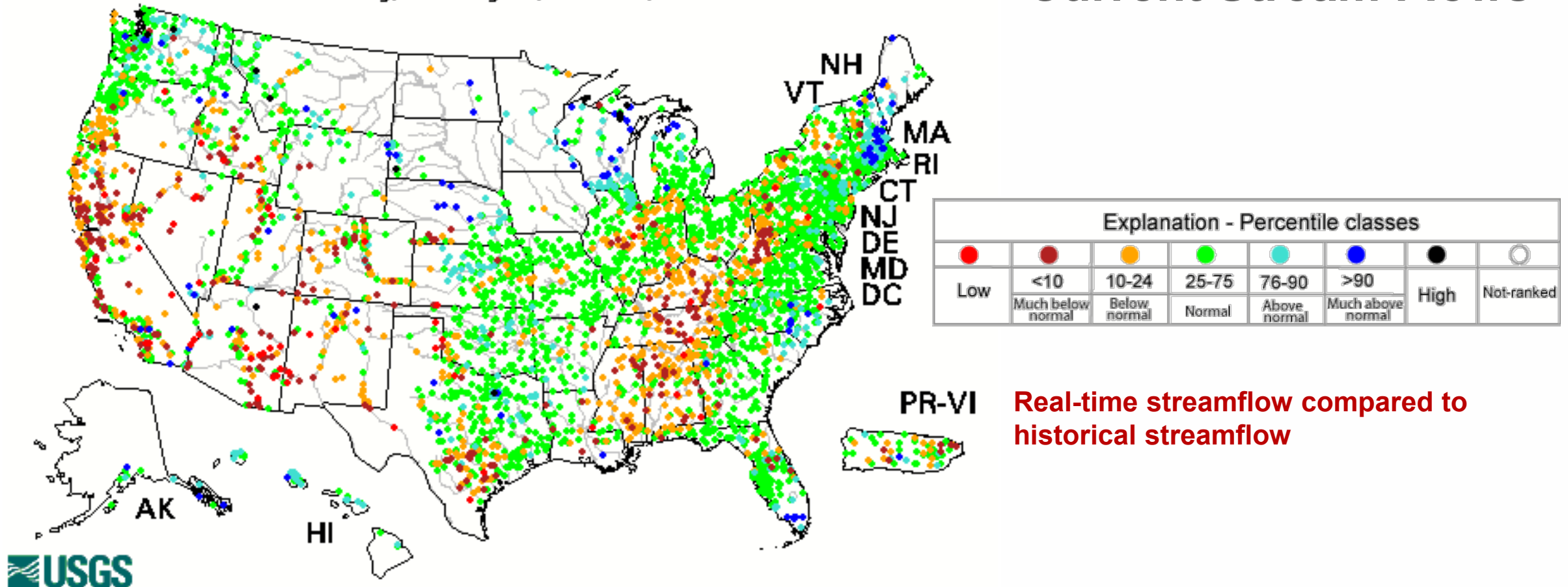
SPoRT-LIS 0-40 cm Soil Moisture percentile valid 21 Jan 2021



https://weather.msfc.nasa.gov/sport/case_studies/lis_IN.html

Thursday, January 21, 2021 04:30ET

Current Stream Flows



USGS

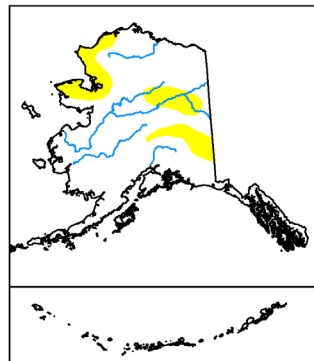
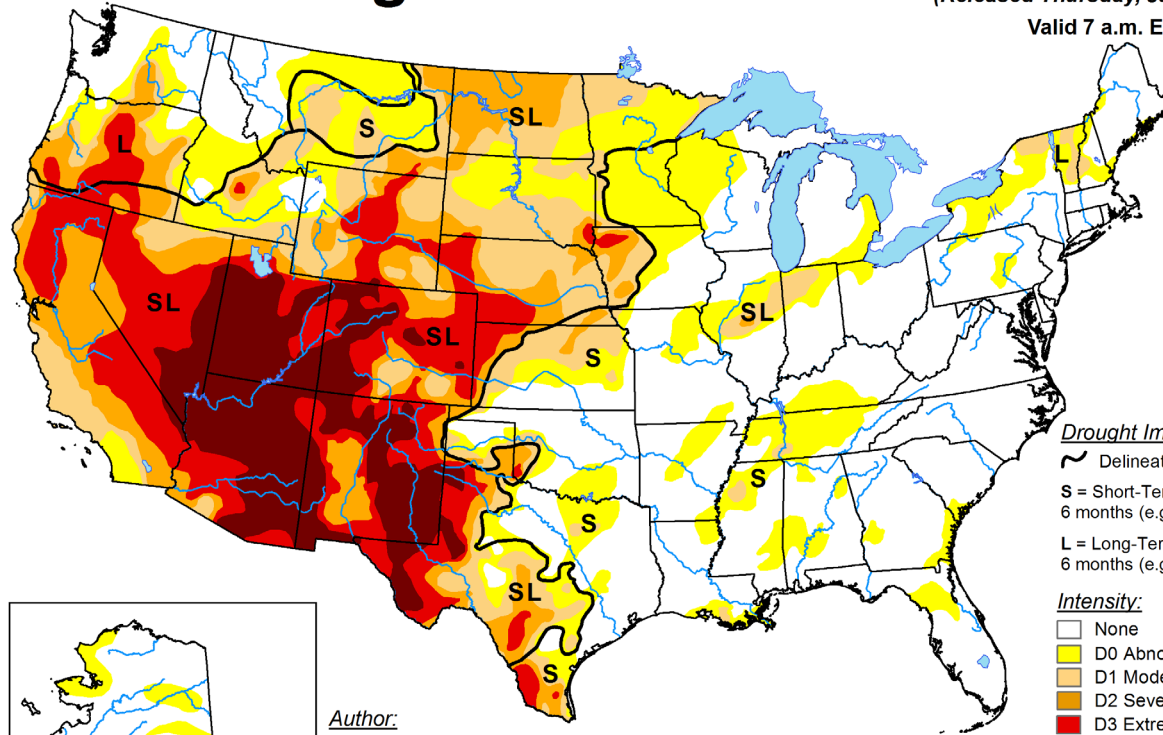
<https://waterwatch.usgs.gov/index.php>

Real-time streamflow compared to historical streamflow

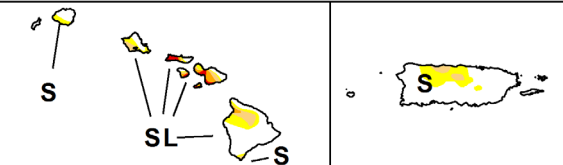
Current US Drought Monitor

U.S. Drought Monitor

January 19, 2021
(Released Thursday, Jan. 21, 2021)
Valid 7 a.m. EST



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP



Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

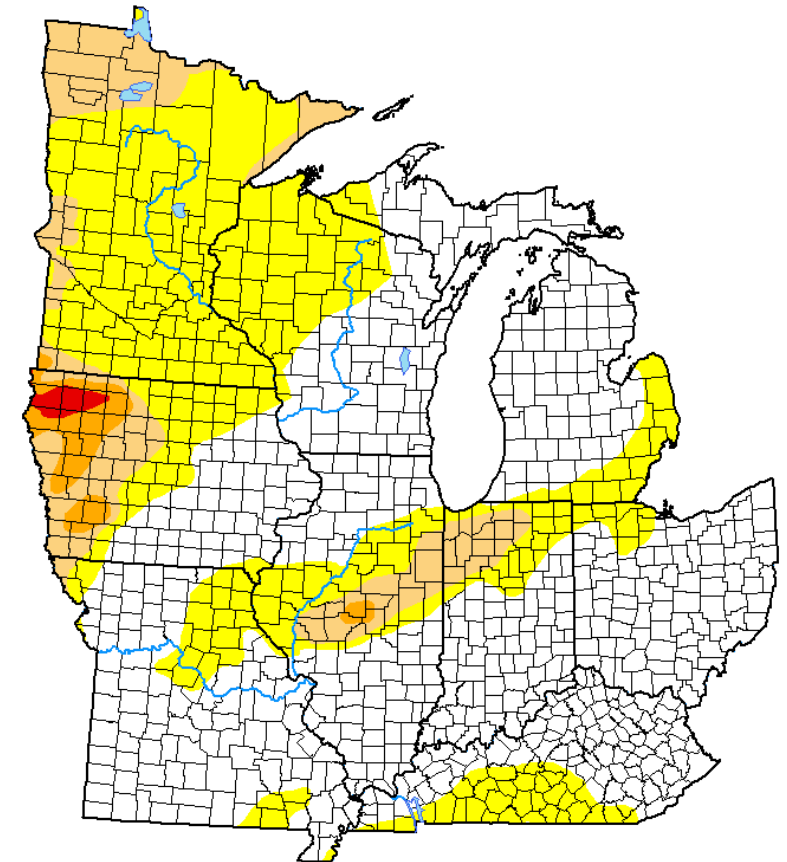
Intensity:

- 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>



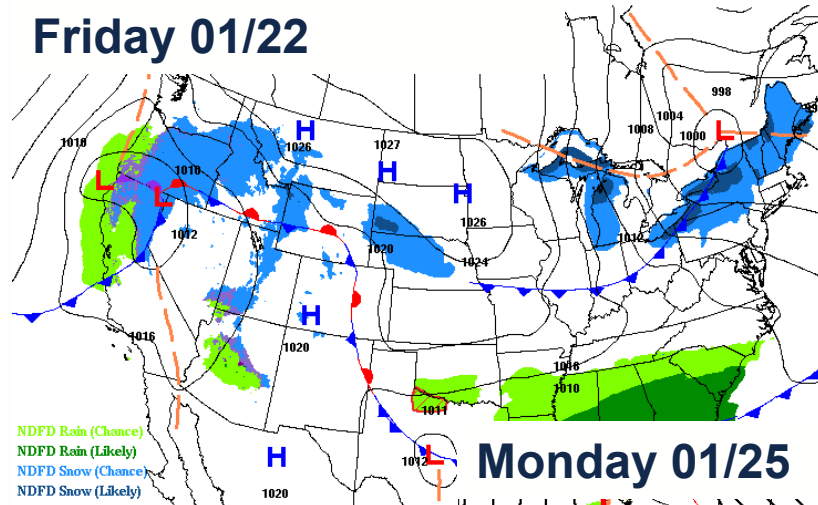
droughtmonitor.unl.edu



Weather for the Week Ahead

<https://www.wpc.ncep.noaa.gov/#>

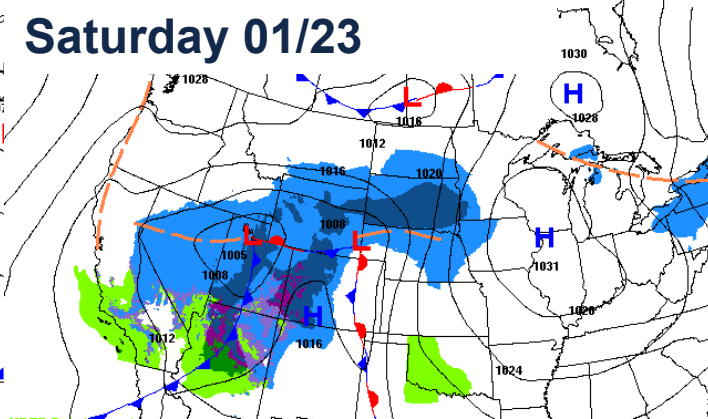
Friday 01/22



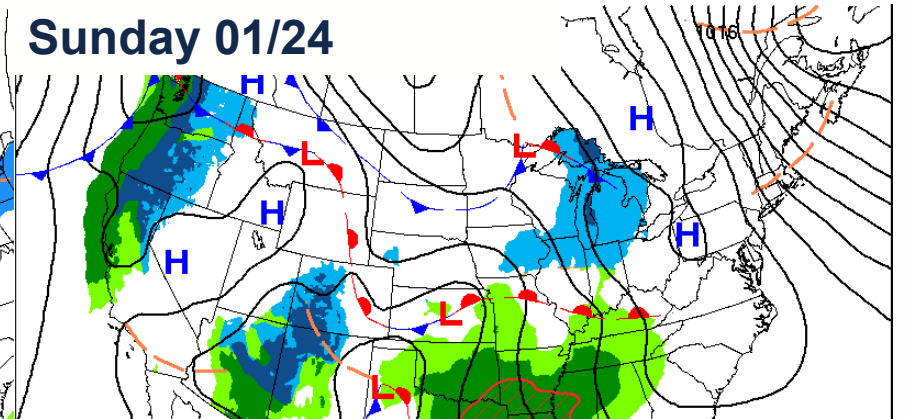
NDFD Rain (Chance)
 NDFD Rain (Likely)
 NDFD Snow (Chance)
 NDFD Snow (Likely)
 NDFD Mix (Chance)
 NDFD Mix (Likely)
 NDFD Ice (Chance)
 NDFD Ice (Likely)
 NDFD T-Storm (Chance) (Hatched)
 NDFD T-Storm (Likely and/or Severe)

WPC Fronts/NDFD
 Issued: 0659Z Thu
 Valid 12Z Friday Jan
 Forecaster: ORAVE

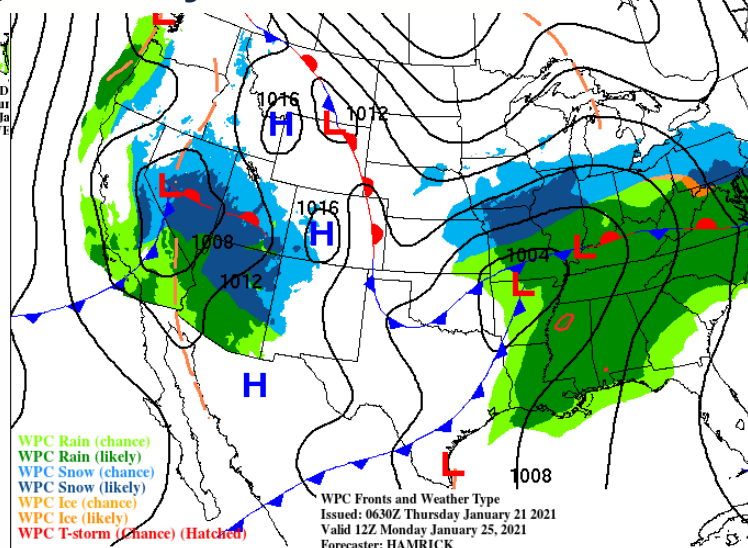
Saturday 01/23



Sunday 01/24



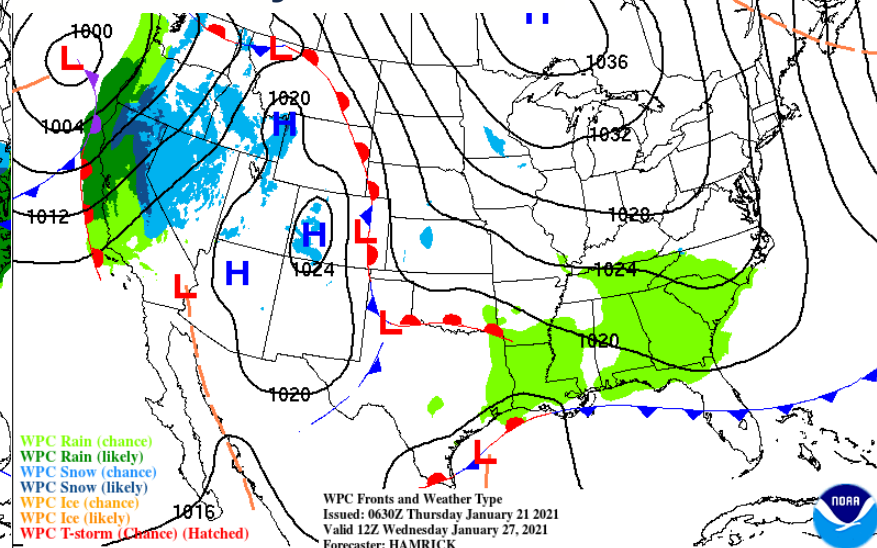
Monday 01/25



WPC Rain (chance)
 WPC Rain (likely)
 WPC Snow (chance)
 WPC Snow (likely)
 WPC Ice (chance)
 WPC Ice (likely)
 WPC T-storm (Chance) (Hatched)

WPC Fronts and Weather Type
 Issued: 0630Z Thursday January 21 2021
 Valid 12Z Monday January 25, 2021
 Forecaster: HAMRICK

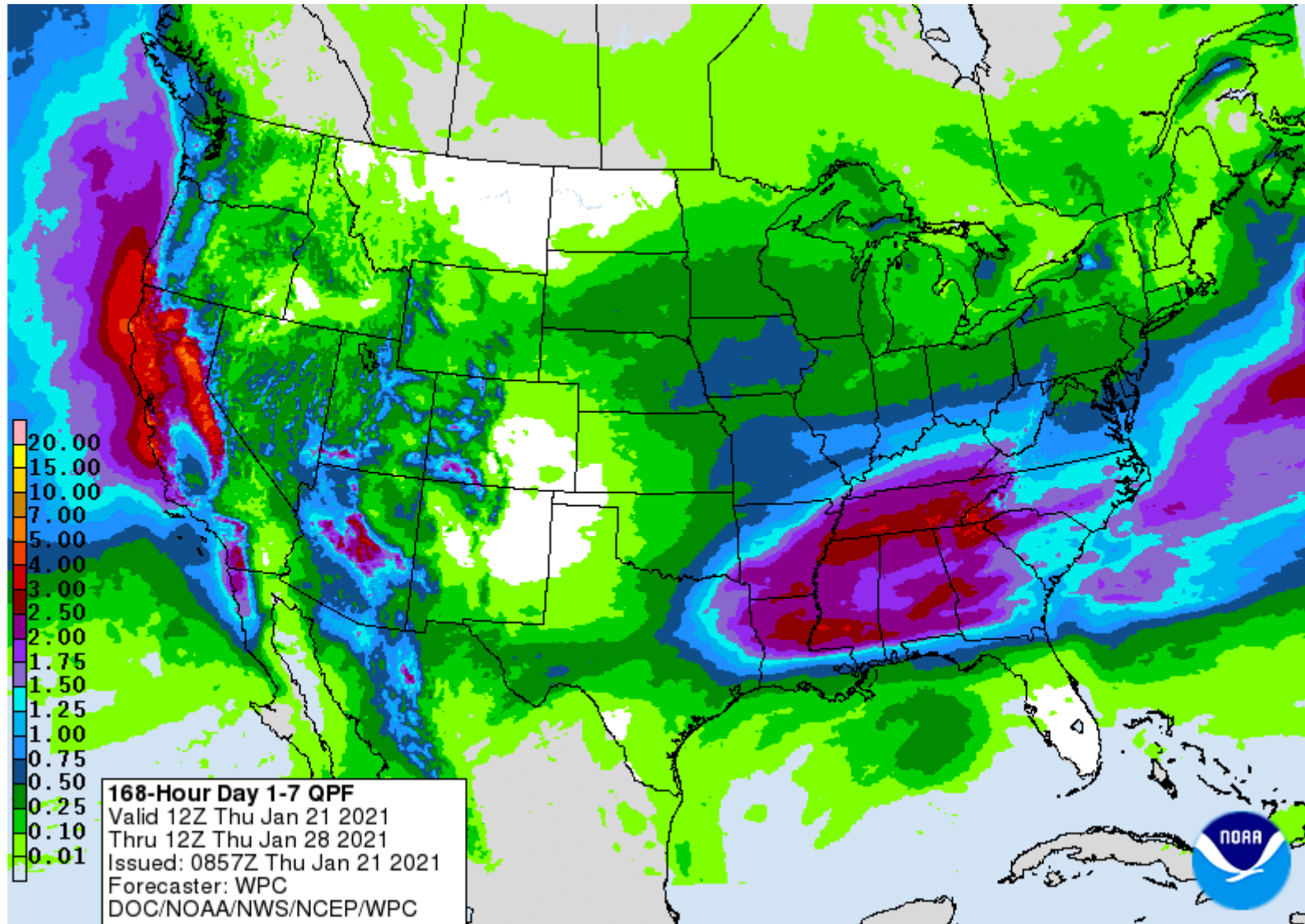
Wednesday 01/27



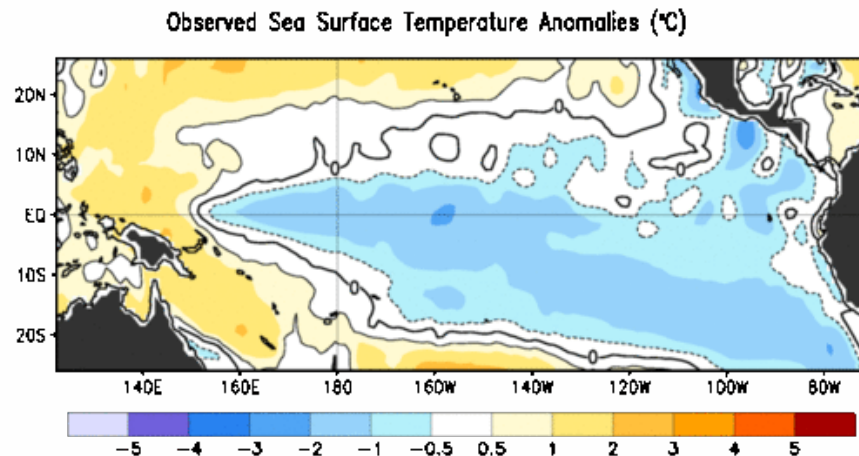
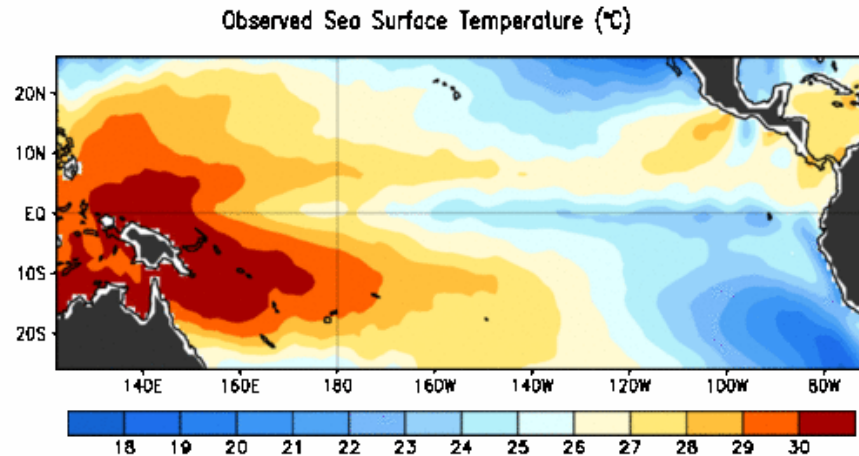
WPC Rain (chance)
 WPC Rain (likely)
 WPC Snow (chance)
 WPC Snow (likely)
 WPC Ice (chance)
 WPC Ice (likely)
 WPC T-storm (Chance) (Hatched)

WPC Fronts and Weather Type
 Issued: 0630Z Thursday January 21 2021
 Valid 12Z Wednesday January 27, 2021
 Forecaster: HAMRICK

7-Day Precipitation Forecast



La Niña – What does it Mean?

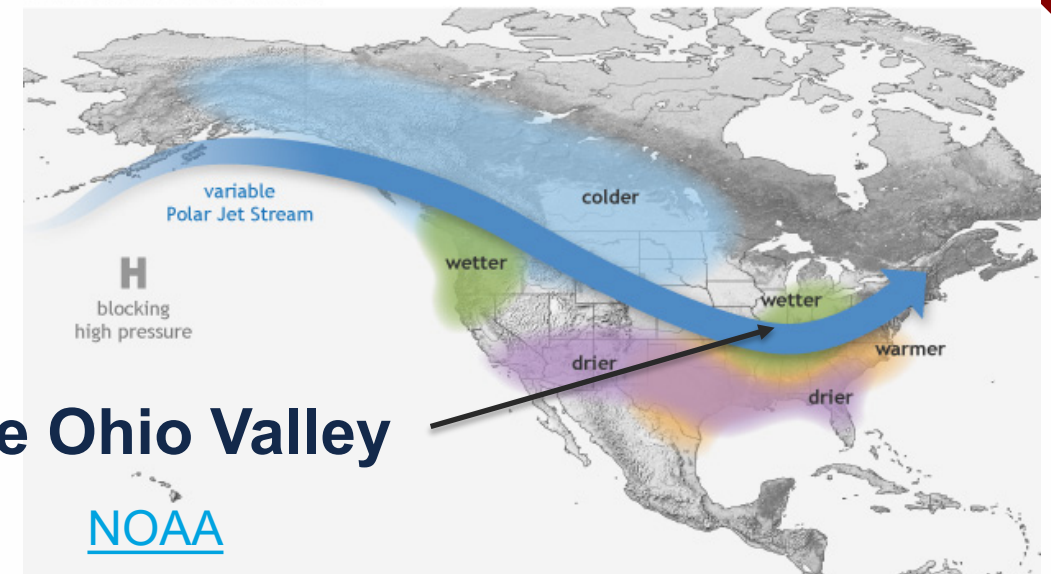


7-day Average Centered on 13 January 2021

Wet in the Ohio Valley

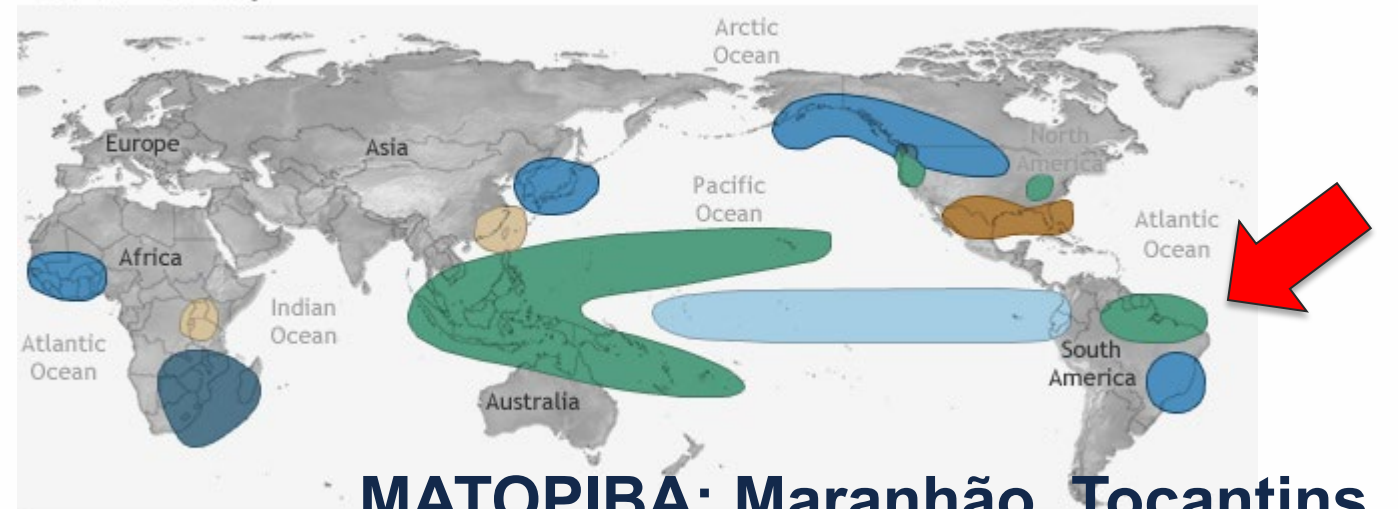
[NOAA](https://www.noaa.gov)

WINTER LA NIÑA PATTERN



LA NIÑA CLIMATE IMPACTS

December-February

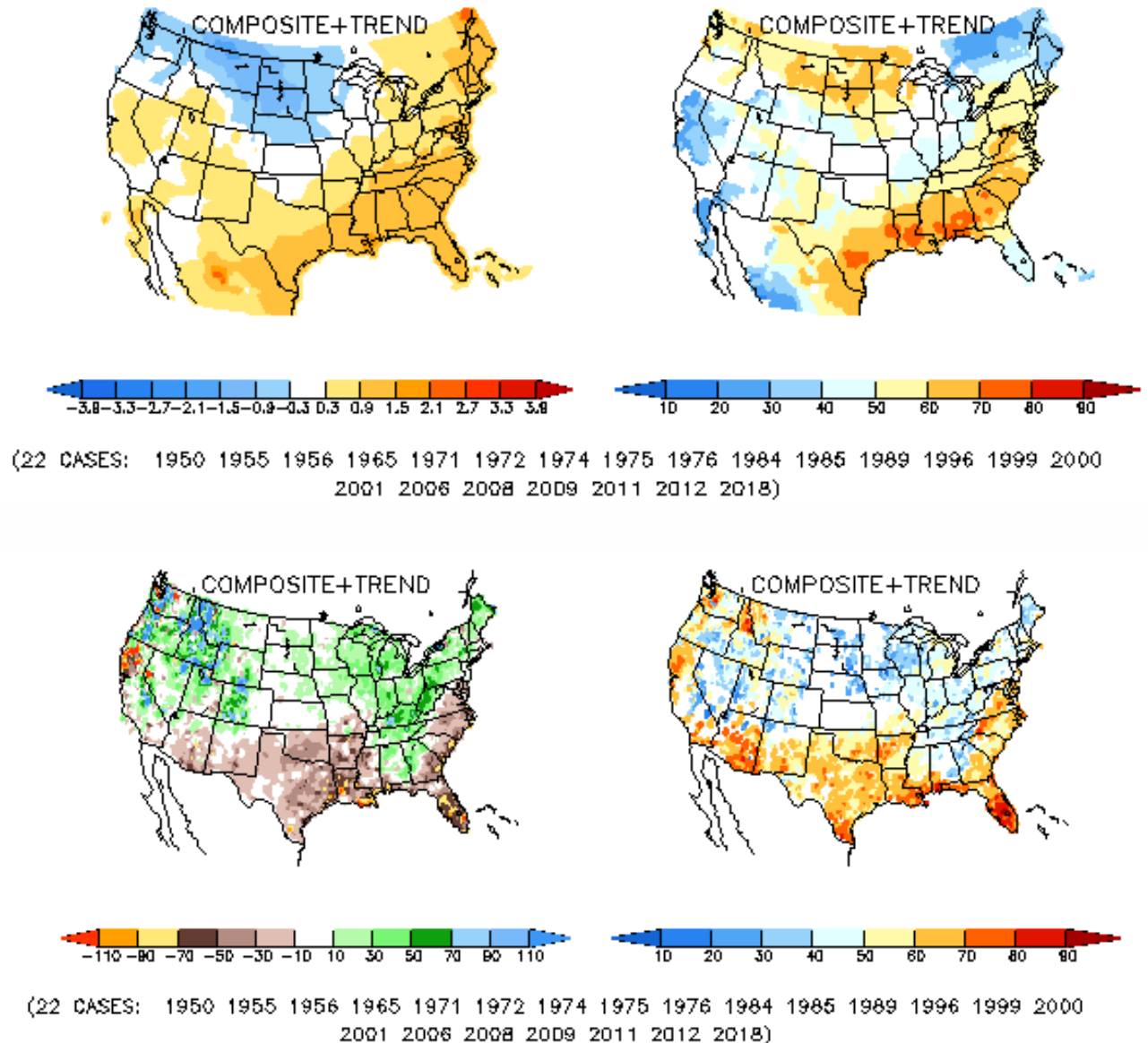


MATOPIBA: Maranhão, Tocantins



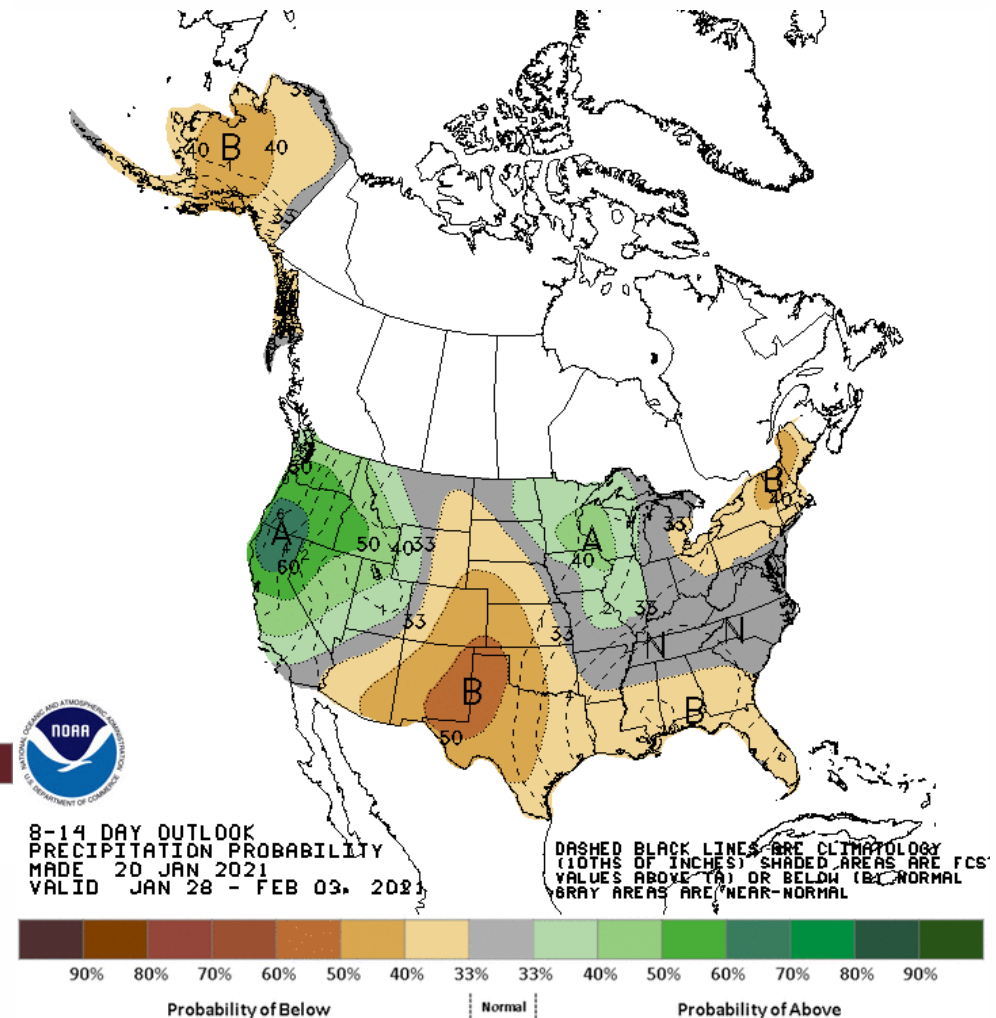
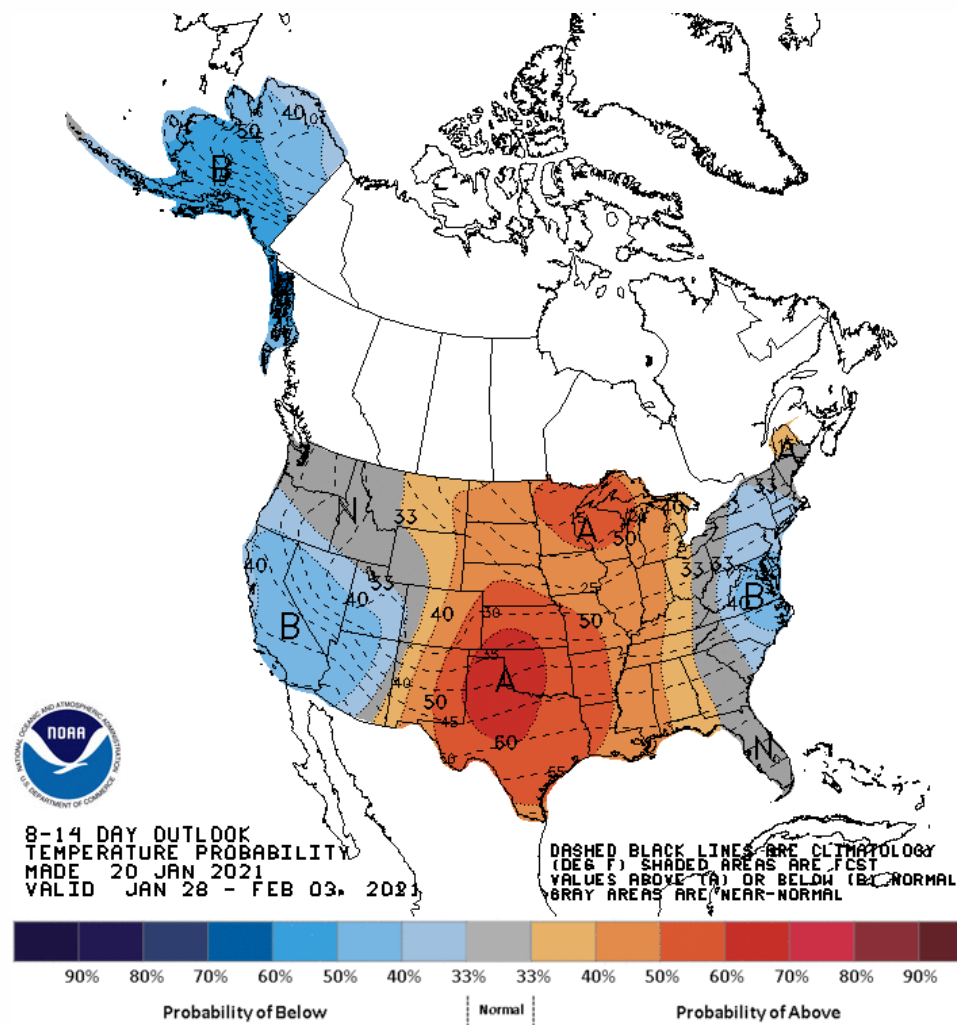
La Niña – What does it Mean?

- Combination of past events and trends reveals that during La Nina conditions:
 - Temperatures tend to be warmer (Arctic is also at play) and temperatures are increasing
 - Precipitation tends to be greater and is increasing
 - Snow? – Perhaps
- I expect soil moisture to recover well throughout the winter



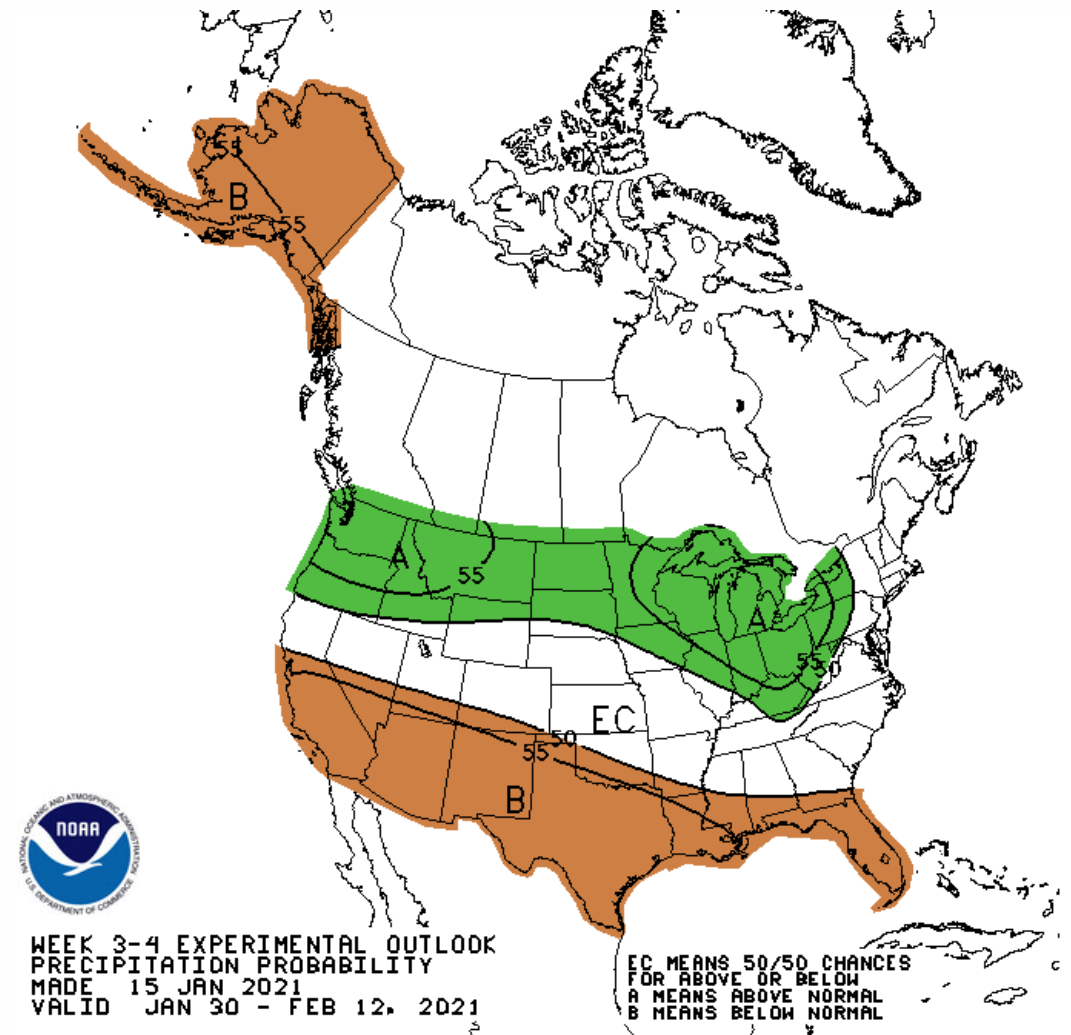
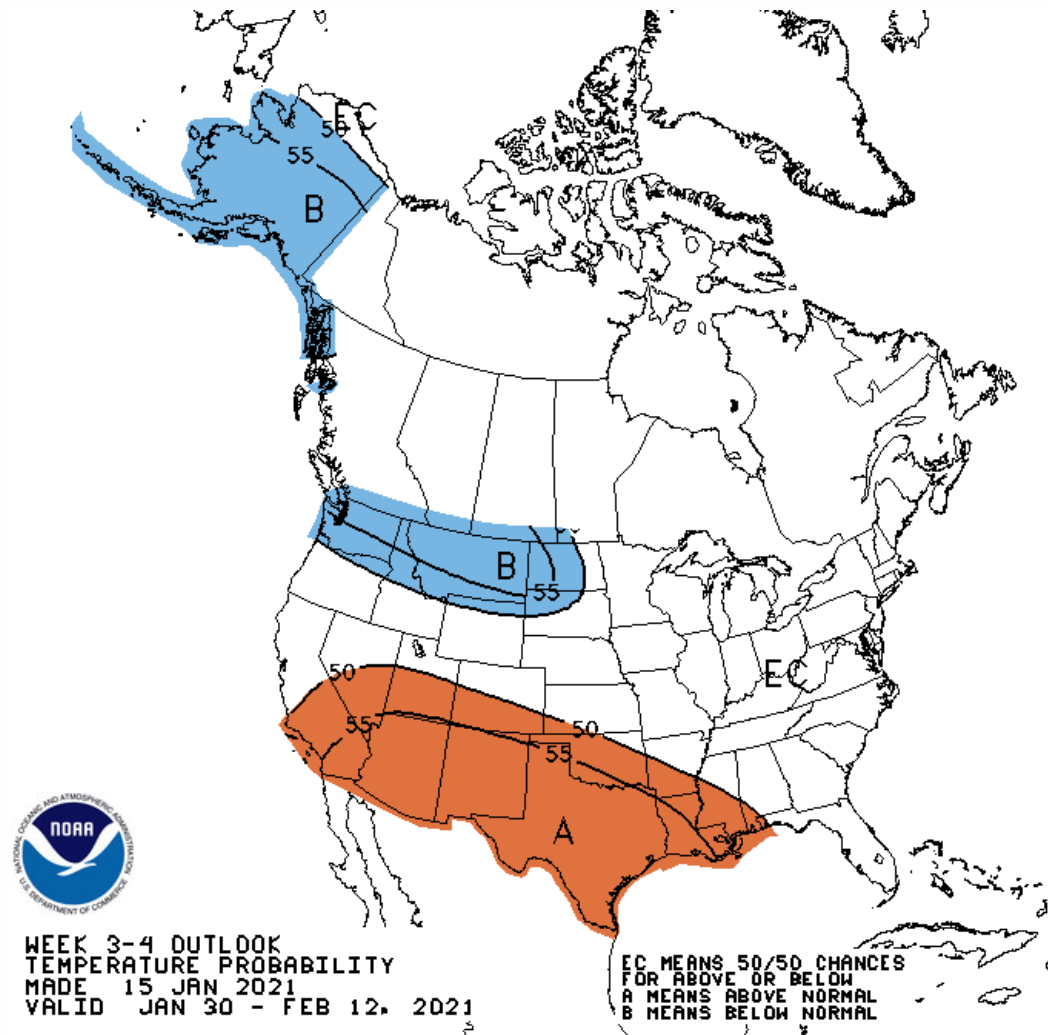
https://www.weather.gov/iwx/la_nina

8-14 Day Outlook

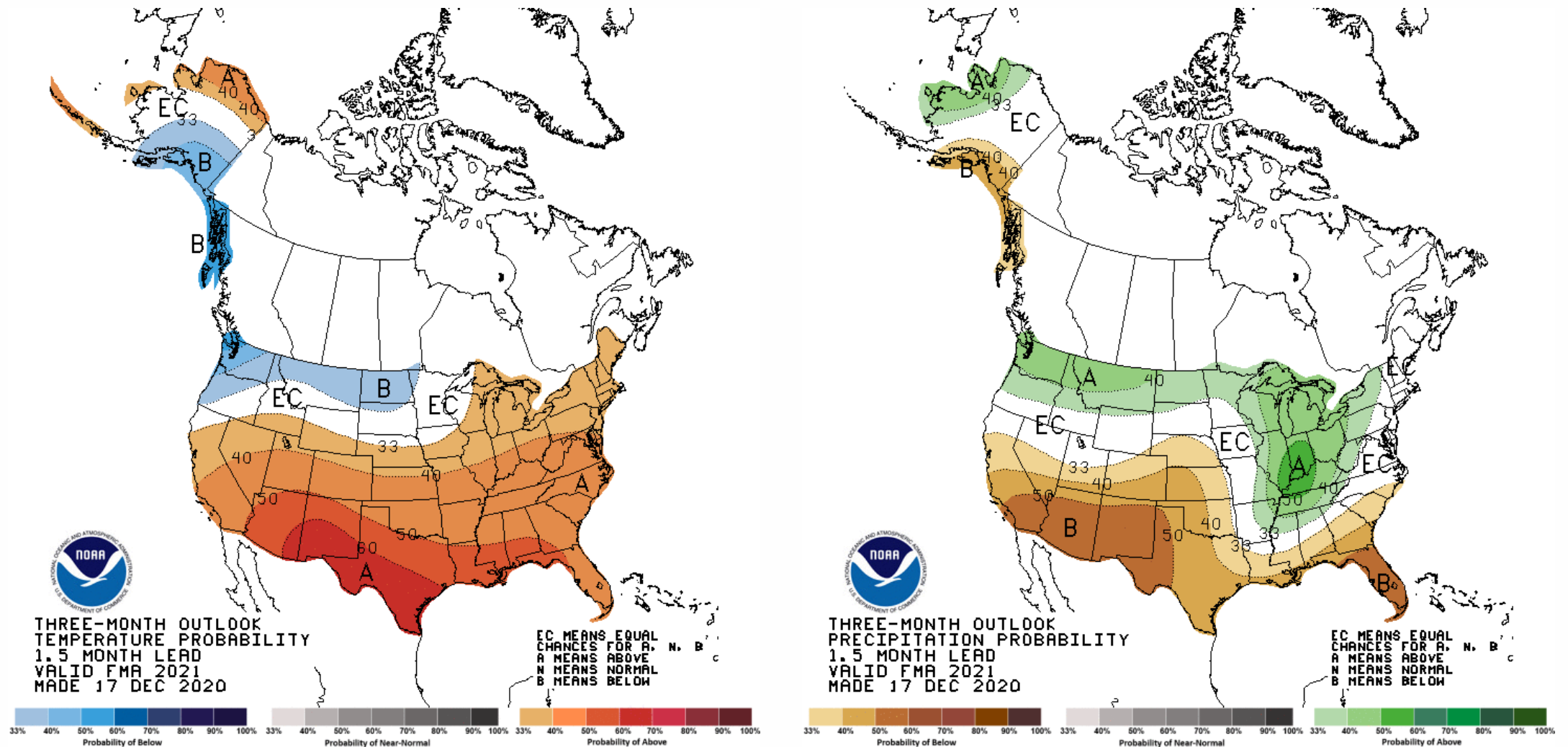


- Higher probability of warmer than average temperatures
- Elevated probability of below average precipitation (NE Ohio)

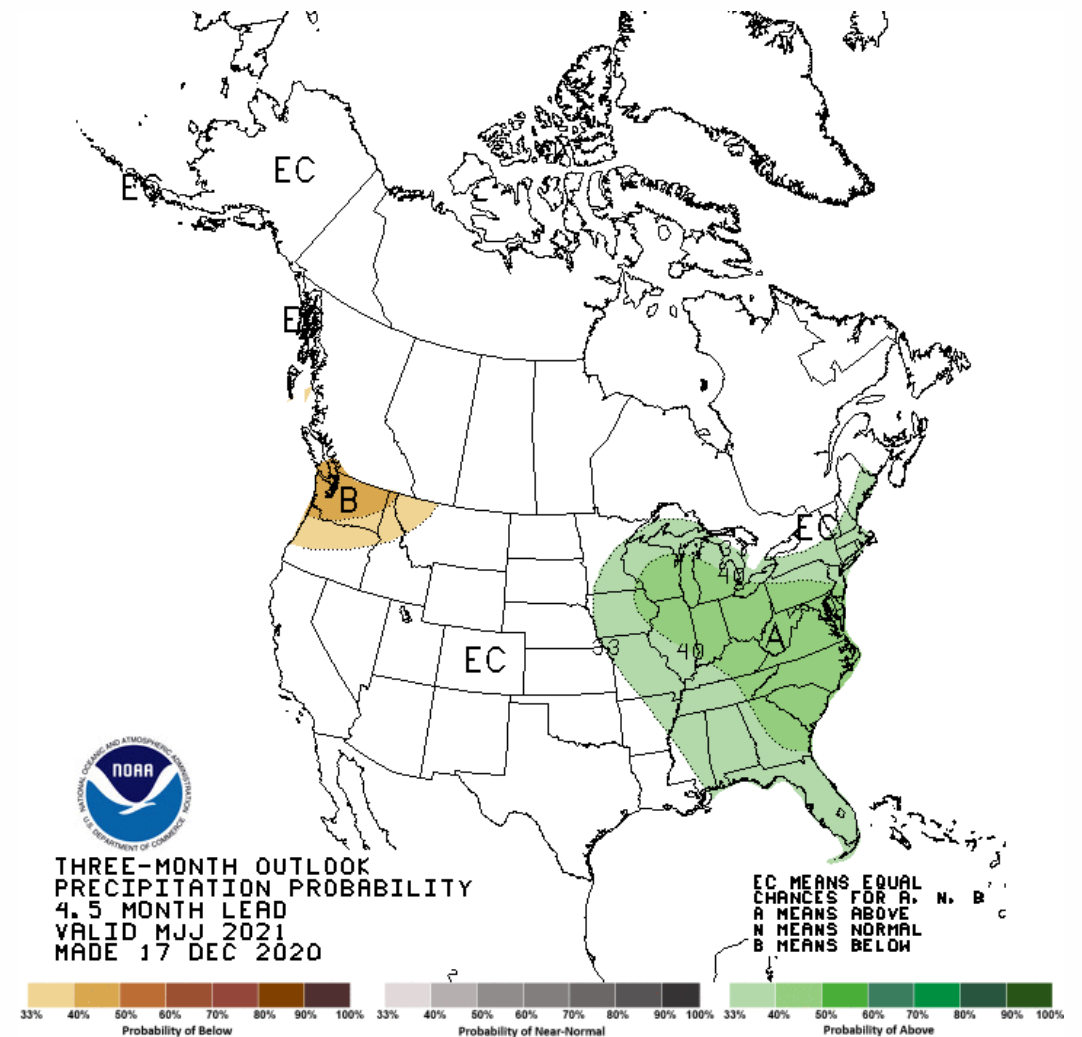
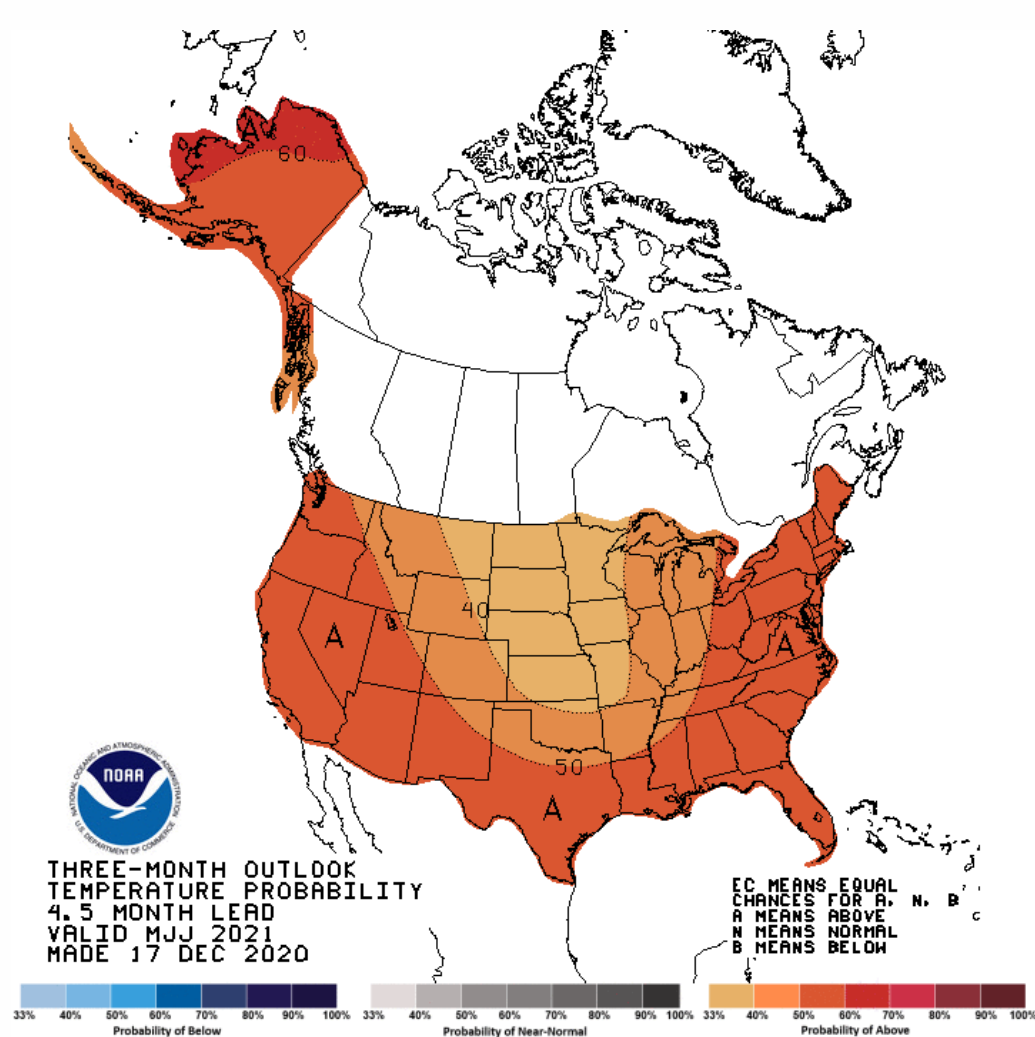
3-4 Week Outlook



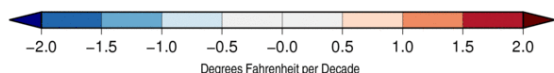
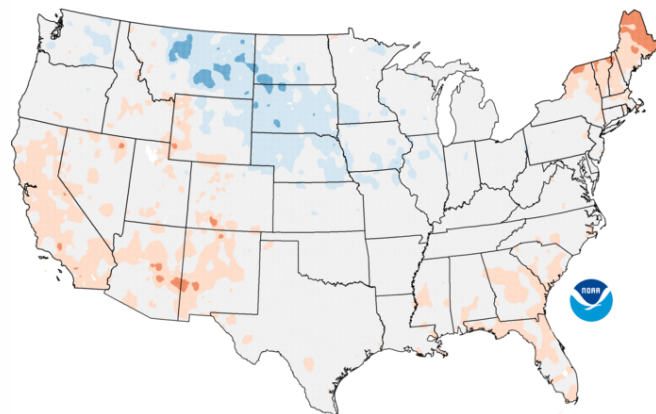
February – April Outlook (CPC Update Coming 1-21)



May – July Outlook (CPC Update Coming 1-21)



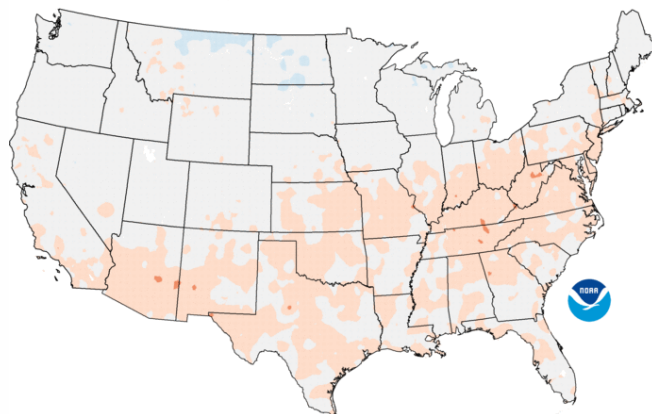
Average Temperature Trends
Winter 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

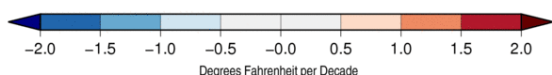
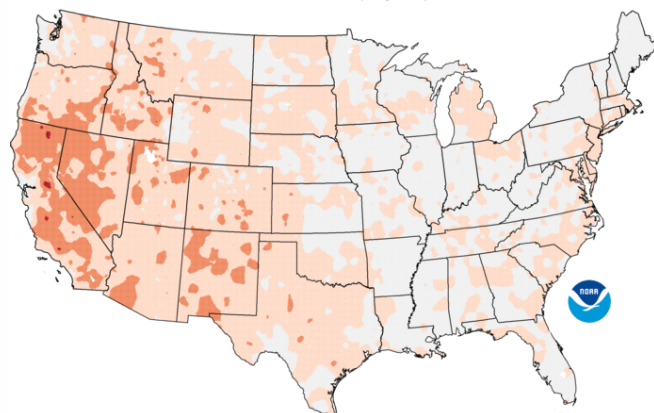
Average Temperature Trends
Spring 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

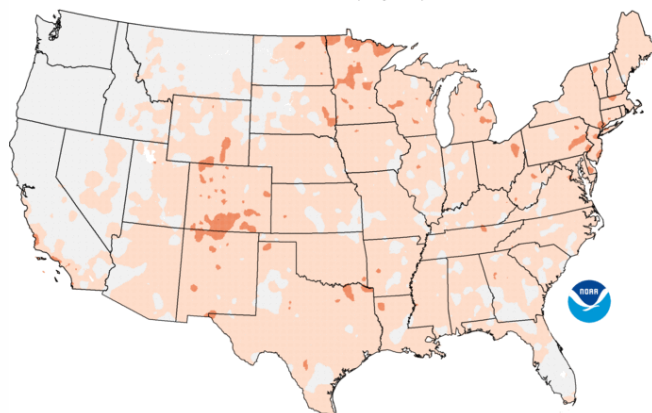
Average Temperature Trends
Summer 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

Average Temperature Trends
Autumn 1990–2019 (30 years)

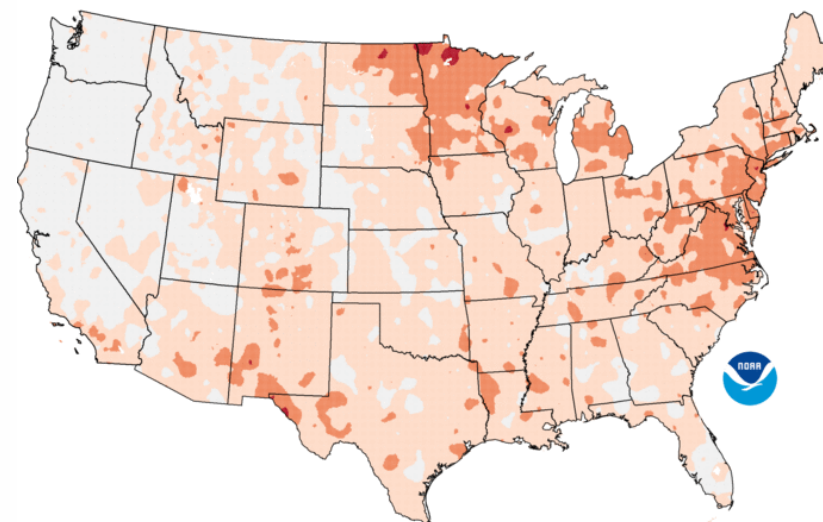


Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

CHANGES IN MEAN SEASONAL TEMPERATURES

Average Minimum Temperature Trends
Autumn 1990–2019 (30 years)



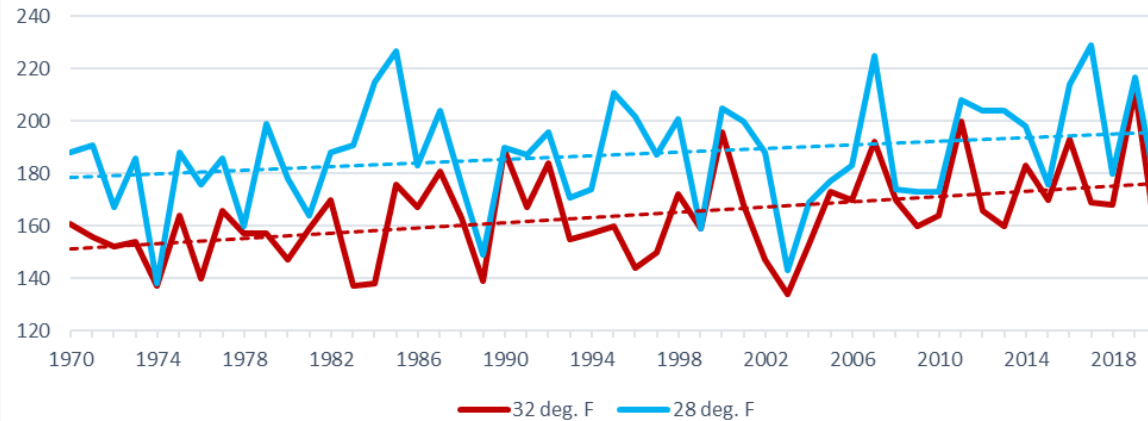
Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

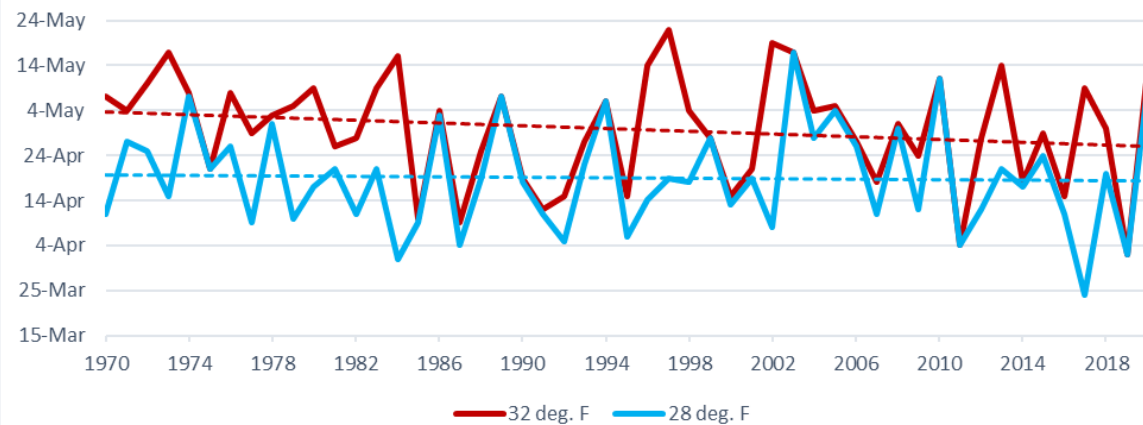
Growing Season Considerations (NW Ohio Example)

- Growing Season is Longer
- Date of Last Spring Freeze is Earlier
- Date of First Fall Freeze is Later

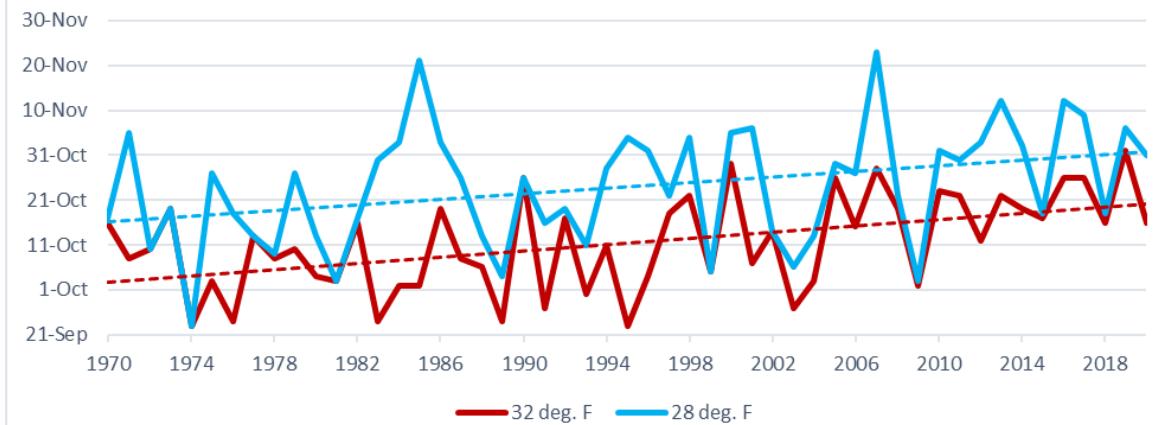
Wauseon: Growing Season Length



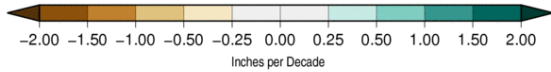
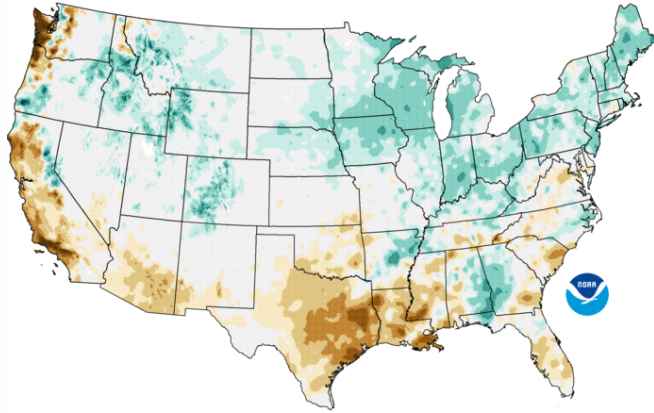
Wauseon: Date of Last Spring Freeze



Wauseon: Date of First Fall Freeze



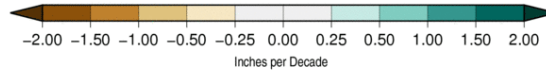
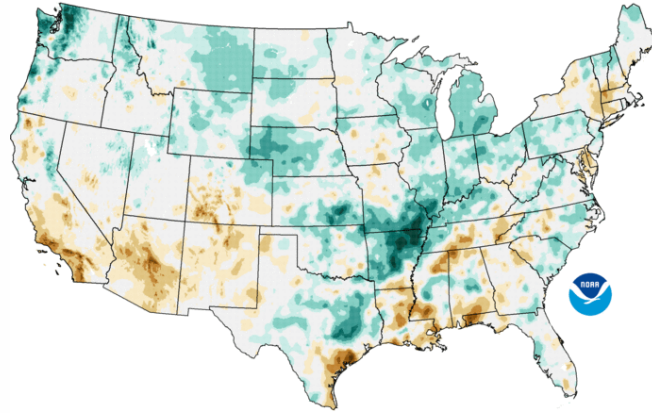
Precipitation Trends
Winter 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

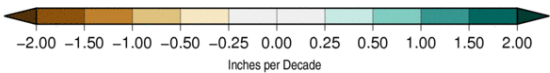
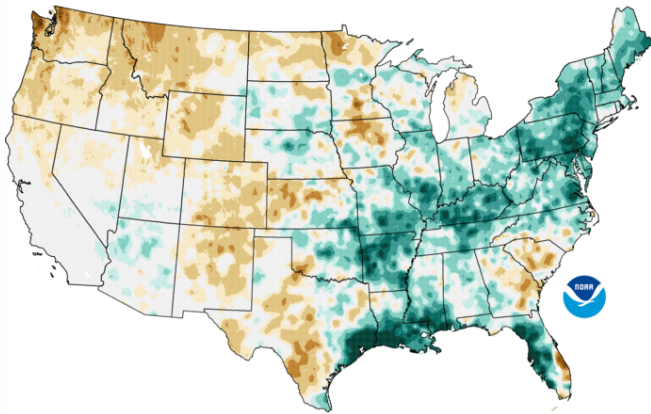
Precipitation Trends
Spring 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

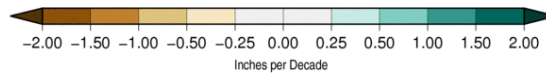
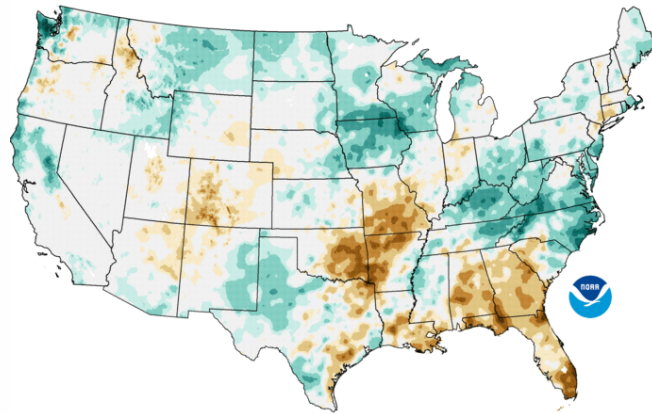
Precipitation Trends
Summer 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

Precipitation Trends
Autumn 1990–2019 (30 years)

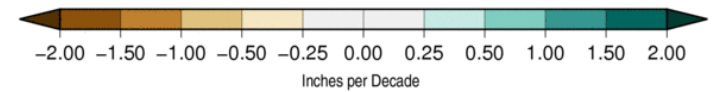
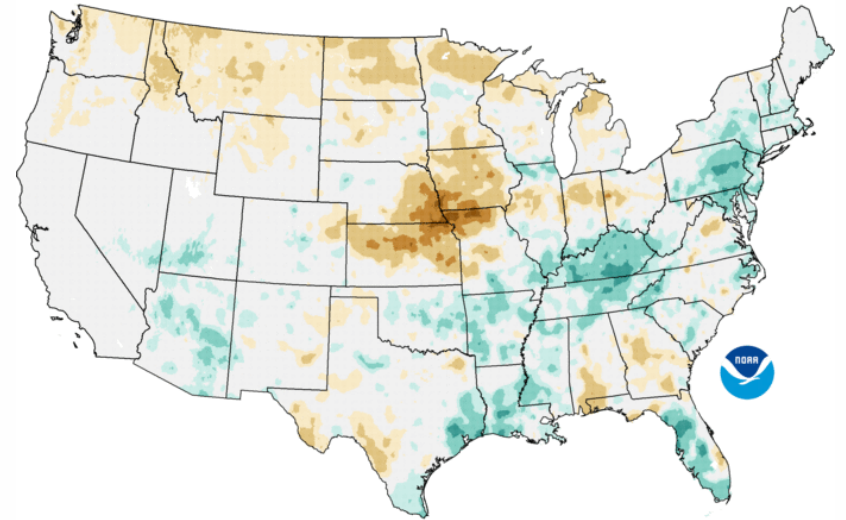


Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

CHANGES IN MEAN SEASONAL PRECIPITATION

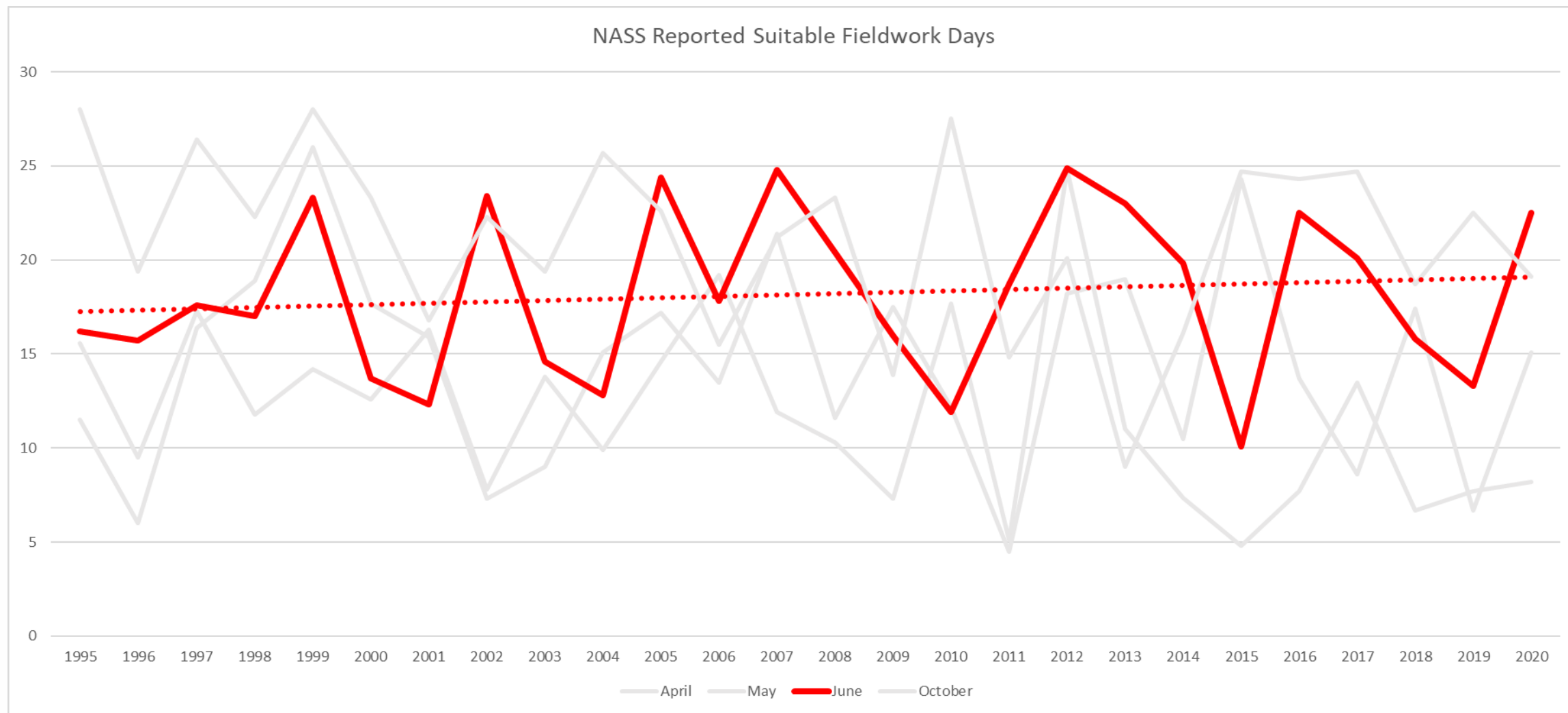
Precipitation Trends
July 1990–2019 (30 years)



Data Source: 5km Gridded Dataset (nClimGrid)

National Centers for
Environmental Information

Suitable Fieldwork Conditions: Ohio



International Look-in

January 12, 2021

Weekly Weather and Crop Bulletin

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International Weather and Crop Summary

January 3-9, 2021

International Weather and Crop Highlights and Summaries provided by USDA/WAOB

HIGHLIGHTS

EUROPE: Wet weather prevailed across much of the continent, with below-normal temperatures in western Europe contrasting with abnormal warmth in eastern crop areas.

MIDDLE EAST: Warm, dry weather maintained moderate to severe drought across much of Turkey, though much-needed rain approached from the west.

NORTHWESTERN AFRICA: Heavy rain alleviated drought in Morocco, while sunny skies favored winter grain development in eastern growing areas.

SOUTHEAST ASIA: Heavy showers sustained ample moisture supplies for rice and oil palm in the Philippines, Malaysia, and Indonesia.

AUSTRALIA: Soaking rain and cooler-than-normal weather further benefited summer crops.

SOUTH AFRICA: Showers maintained favorable conditions for corn, sugarcane, and other rain-fed summer crops.

ARGENTINA: Rain returned to western and southern farming regions, but dryness persisted for corn and soybeans over much of central Argentina.

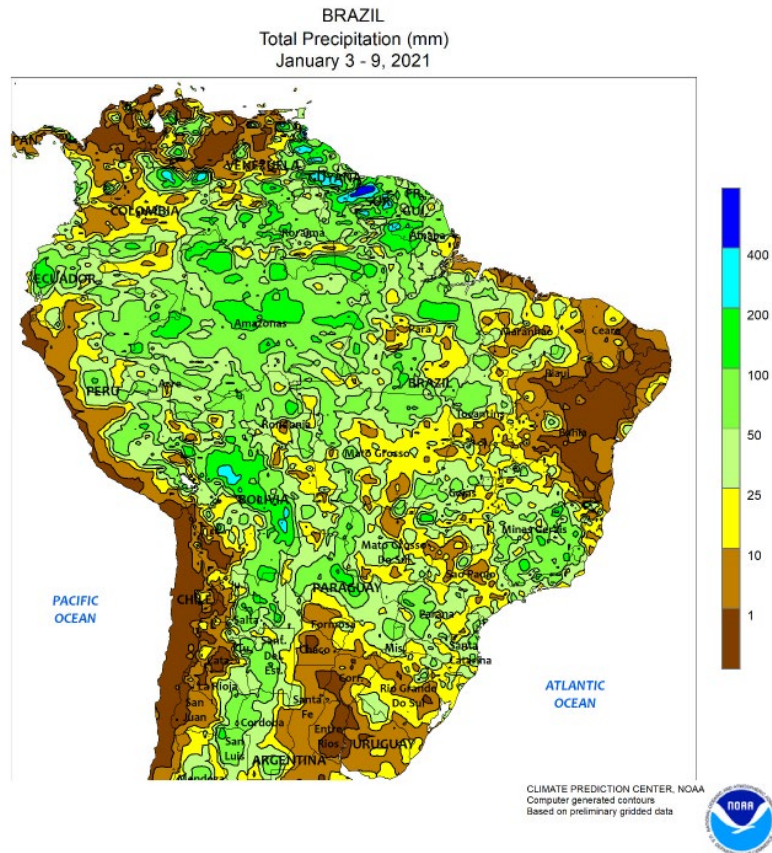
BRAZIL: Scattered showers benefited summer crops throughout much of Brazil, although dryness remained a concern for some southern crops.



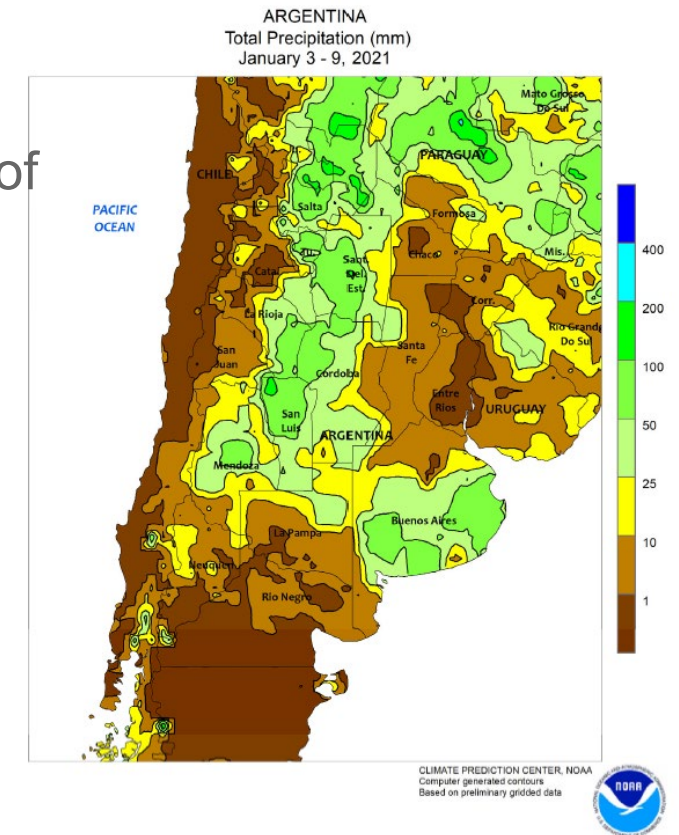
<https://www.usda.gov/oce/weather-drought-monitor>

South America

- Argentina
 - Unseasonable dryness has dominated a key farming region of central Argentina.
 - The dryness and occasional warmth have maintained stress summer crops
 - Showers intensified over Argentina's



- Brazil
 - Scattered showers overspread major farming regions of central and southern Brazil
 - Many locations continued to receive below-normal amounts of rainfall
 - Pockets of dryness also lingered over Sao Paulo and Mato Grosso and portions of the northeastern interior





THANK YOU!

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