

# ND State Climate Office Bi-Weekly Drought Update

Adnan Akyuz, Ph.D.

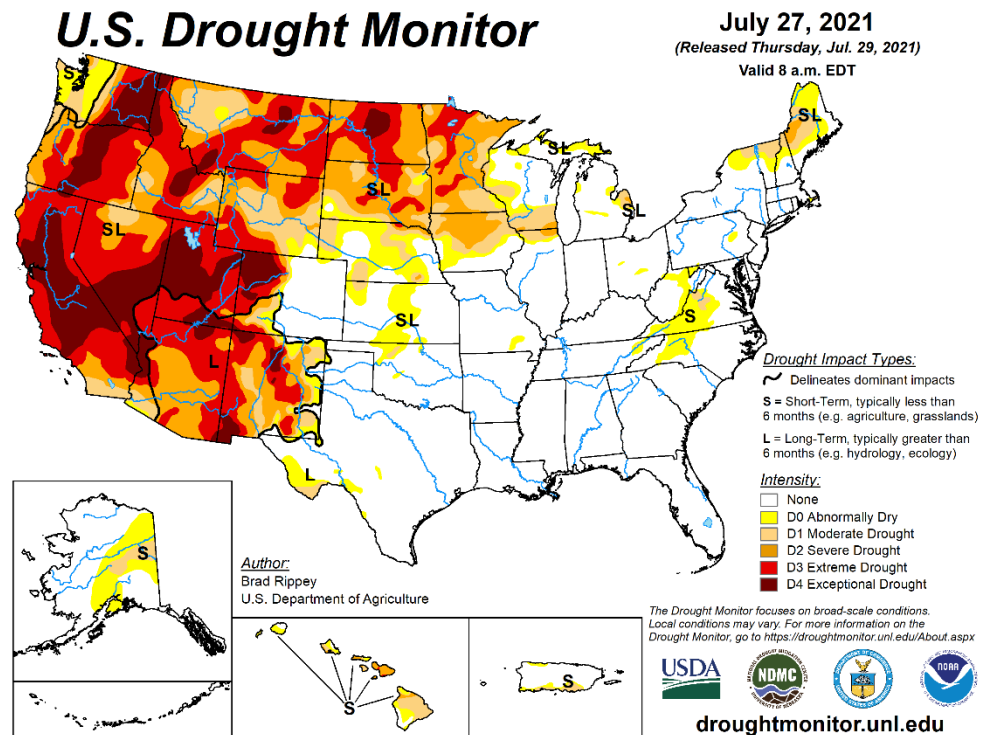
NDSU, AES

State Climatologist

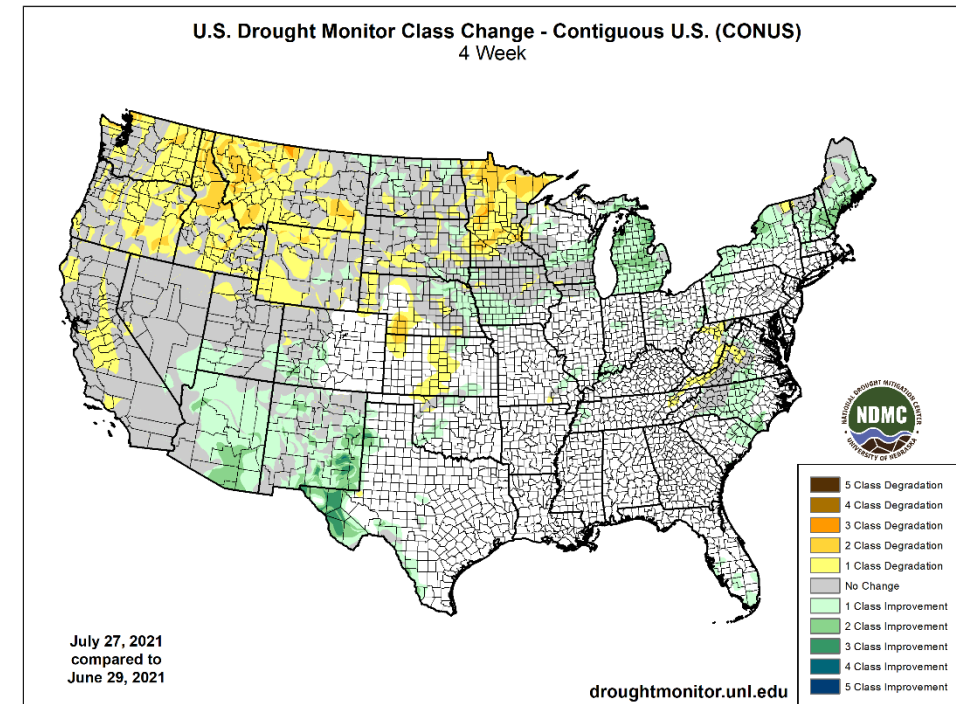
Last Update: 7/29/2021

# US Drought Monitor

## Current

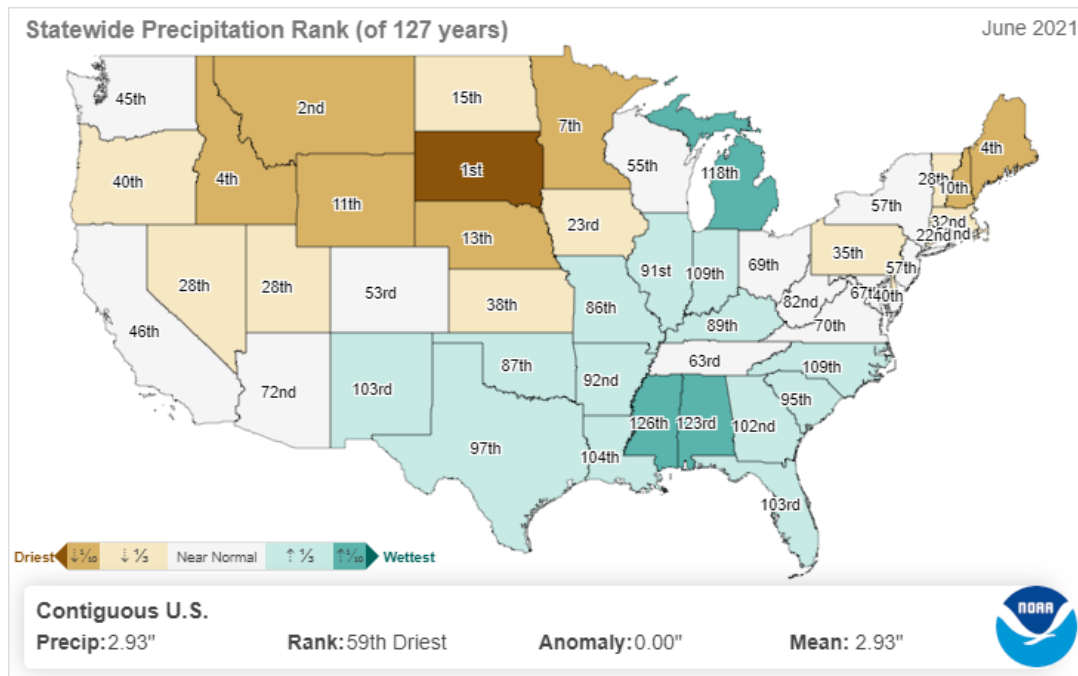


## 4-week change

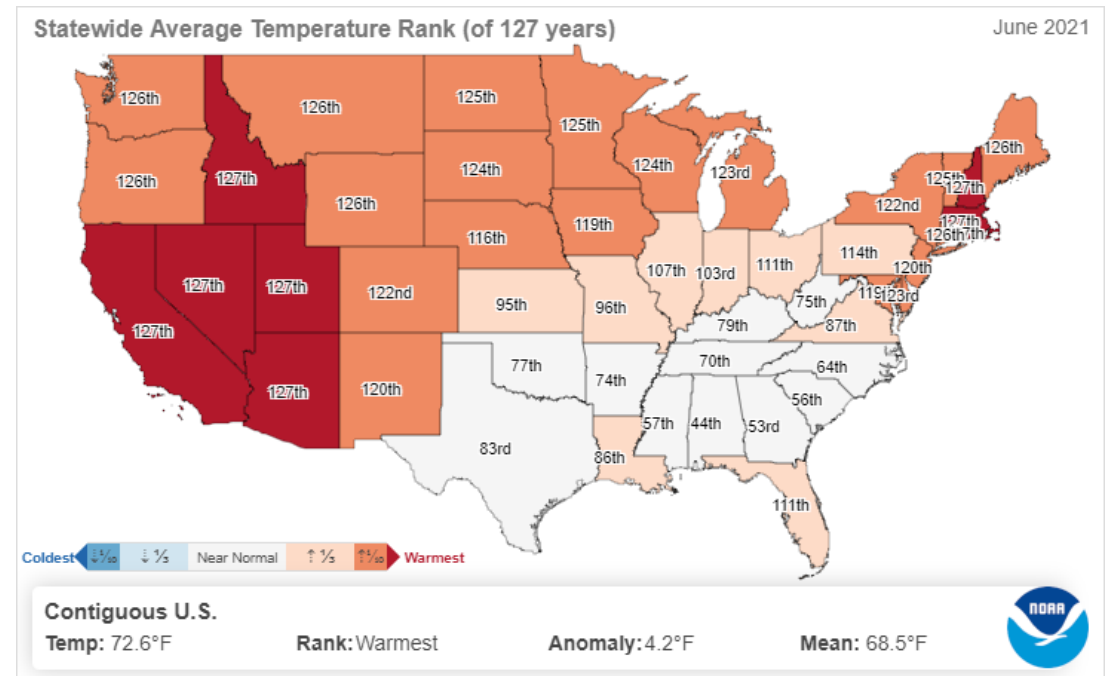


# State-wide Precipitation and Temperature Rankings Last Month

**June Precipitation in ND:  
15th Driest Month**

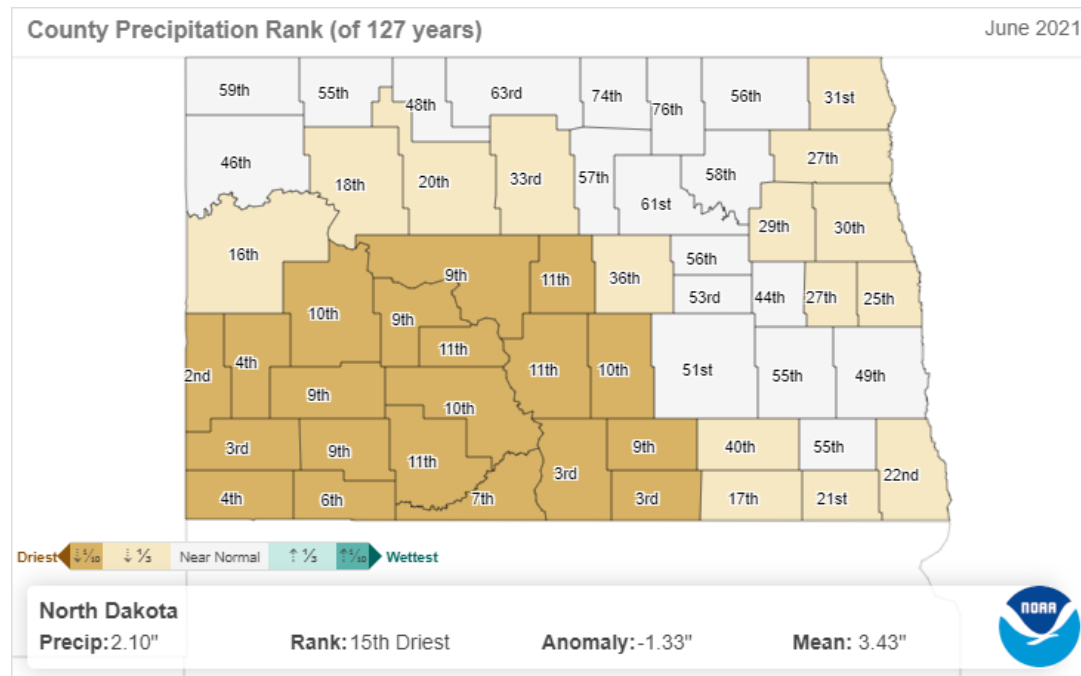


**June Temperature in ND:  
3rd Coldest Month**

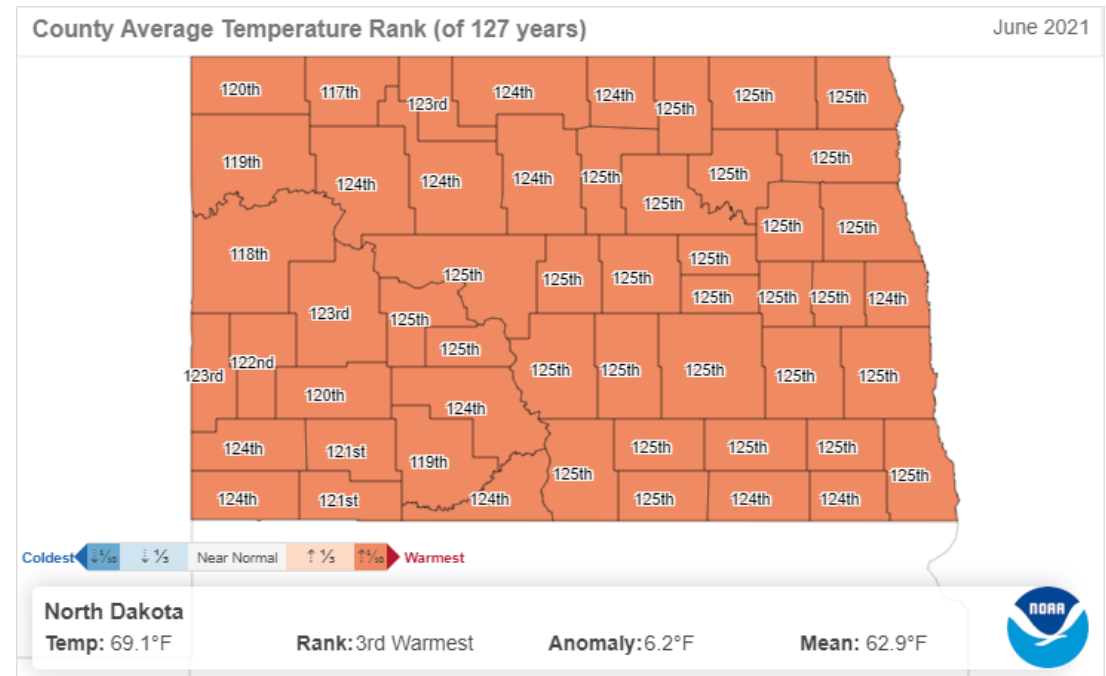


# County-wide Precipitation and Temperature Rankings Last Month

## June Precipitation

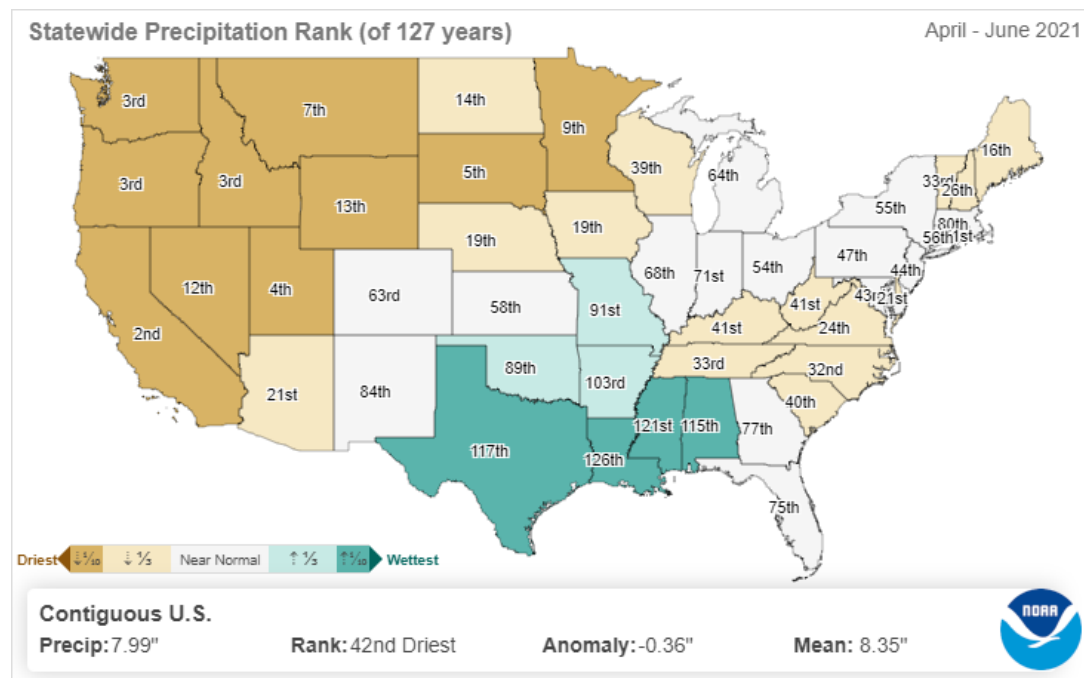


## June Temperature

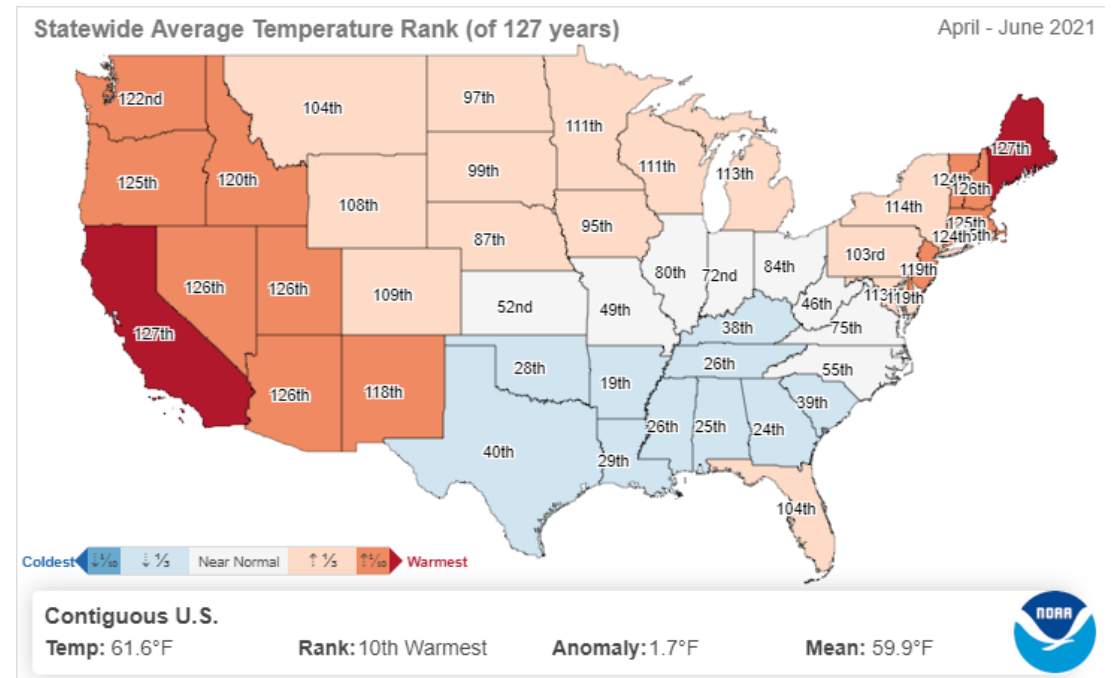


# State-wide Precipitation and Temperature Rankings Last 3 Months

**Apr-Jun Precipitation in ND:  
14th Driest Season**

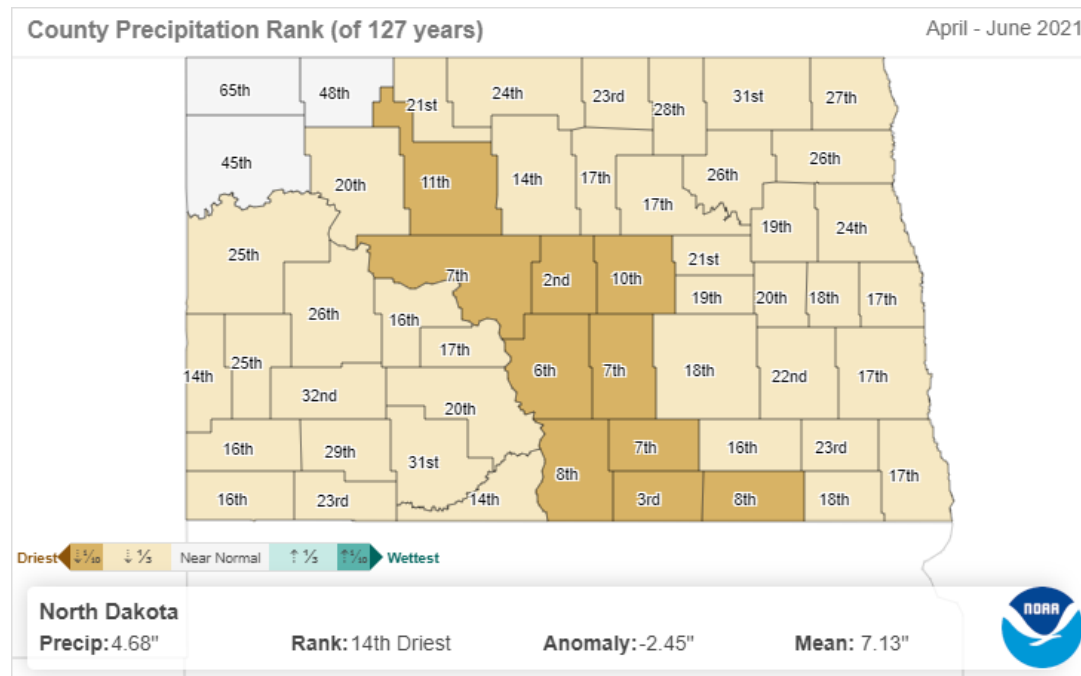


**Apr-Jun Temperature in ND:  
31st Warmest Season**

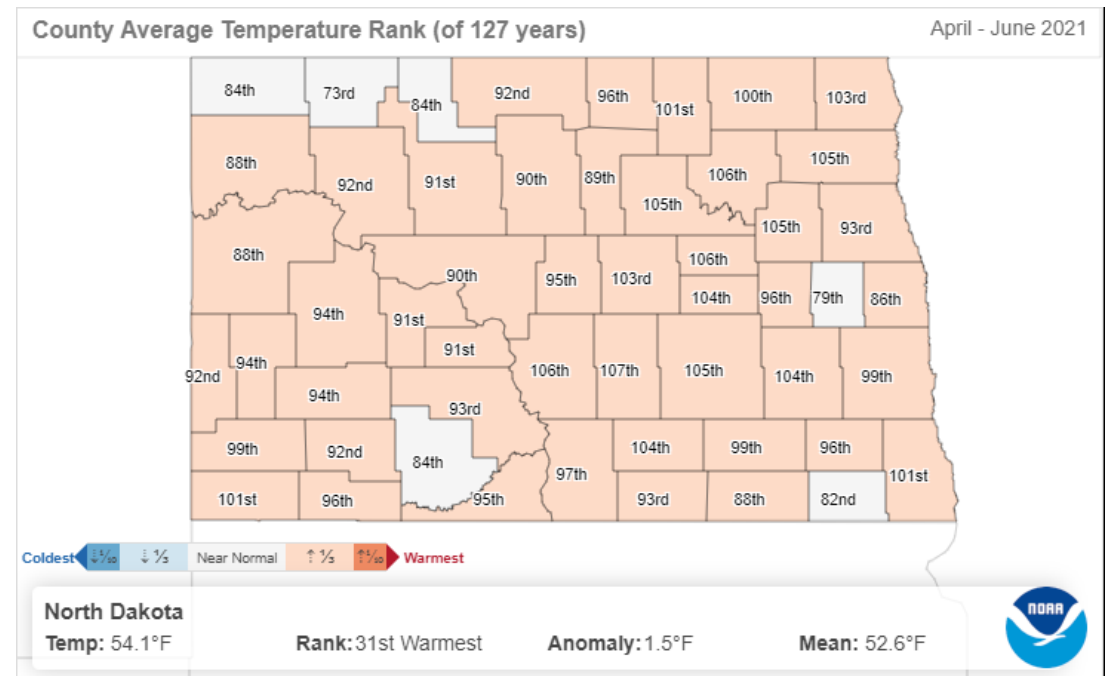


# County-wide Precipitation and Temperature Rankings Last 3 Months

## Apr-Jun Precipitation

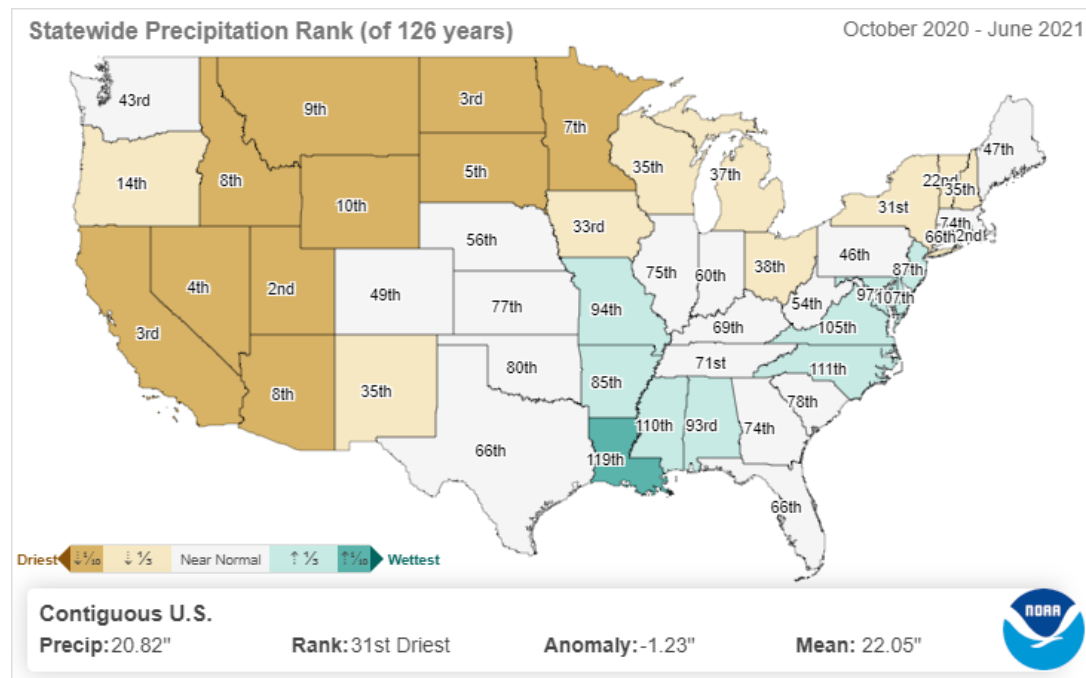


## Apr-Jun Temperature

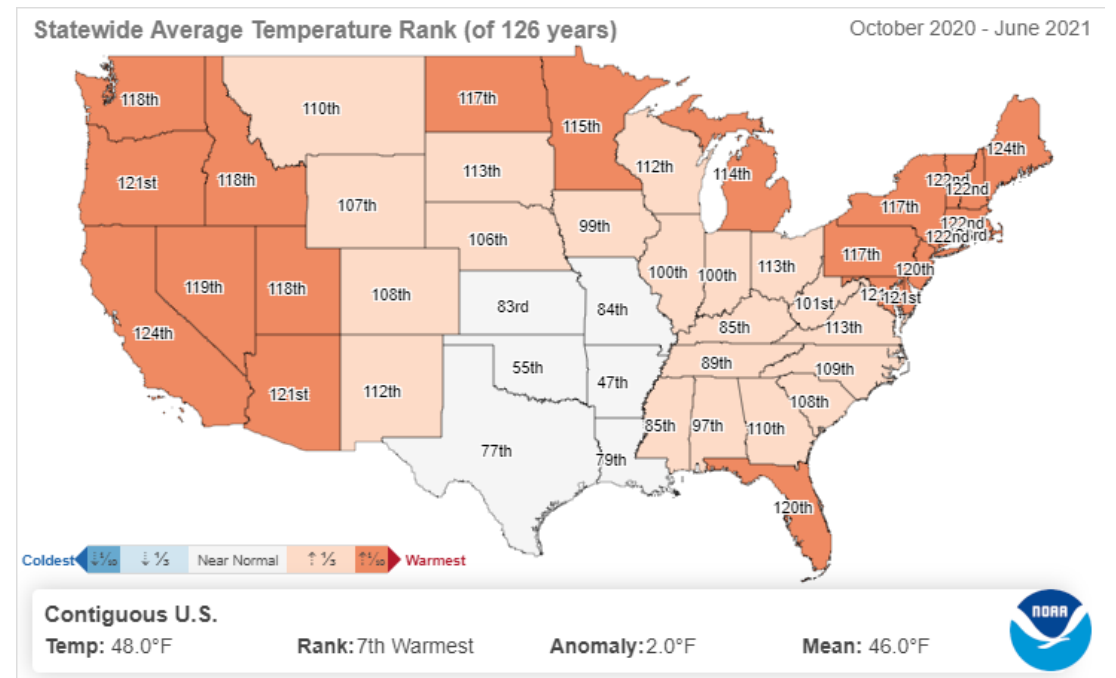


# State-wide Precipitation and Temperature Rankings Last 9 Months

**Oct-Jun Precipitation in ND:  
3rd Period on Record**

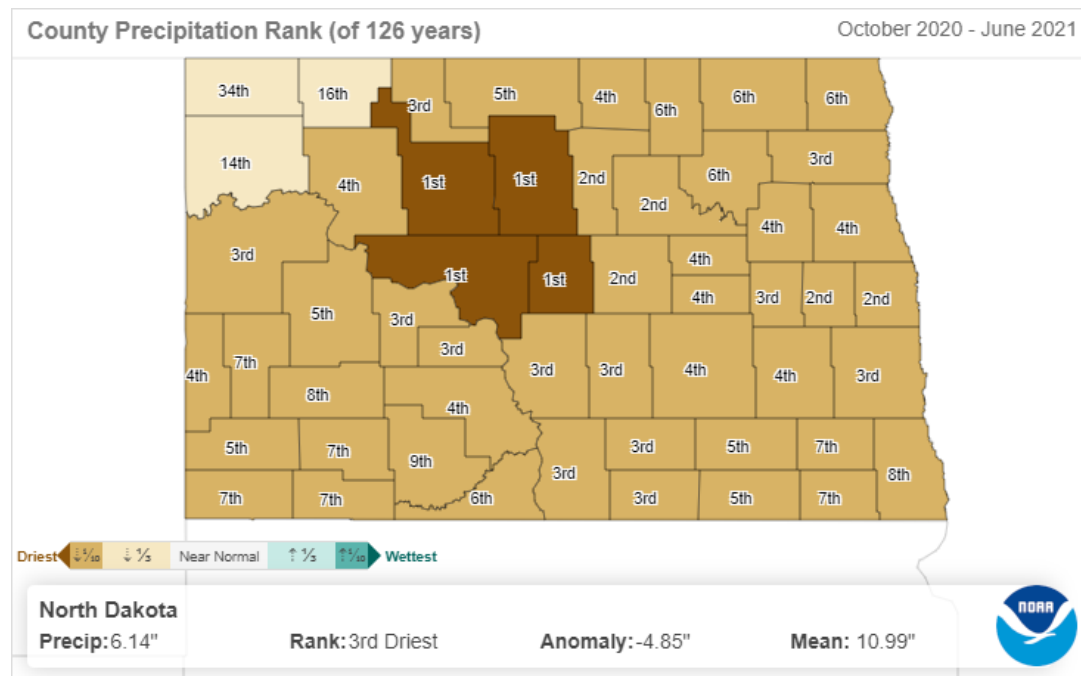


**Oct-Jun Temperature in ND:  
10th Warmest Season on Record**

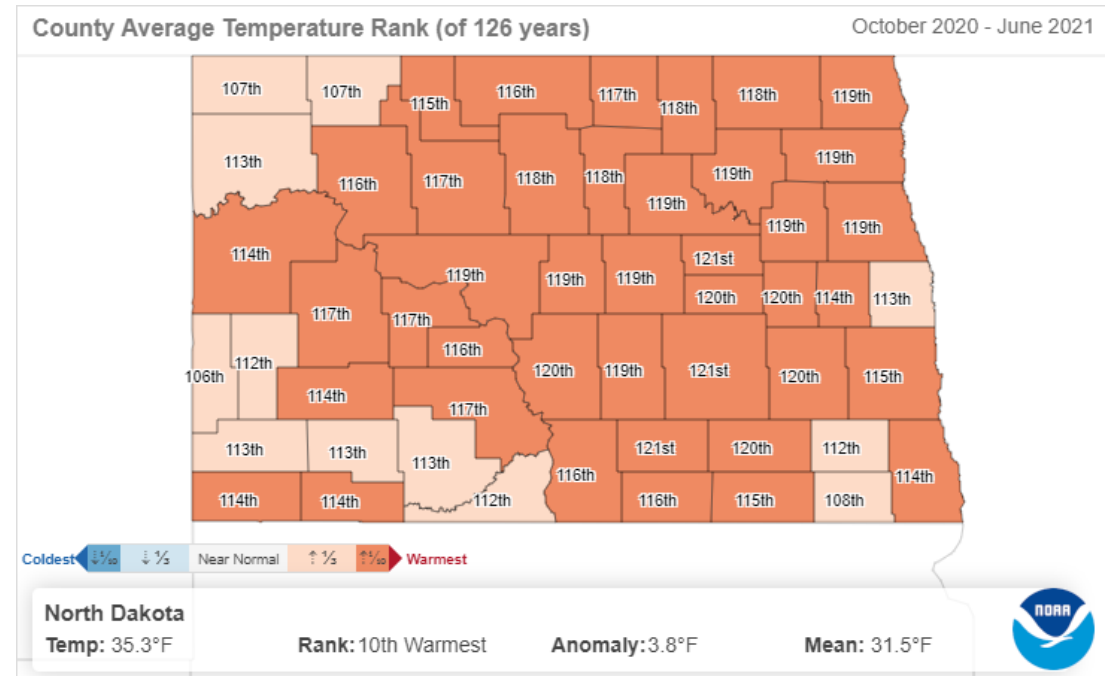


# County-wide Precipitation and Temperature Rankings Last 9 Months

## Oct-Jun Precipitation



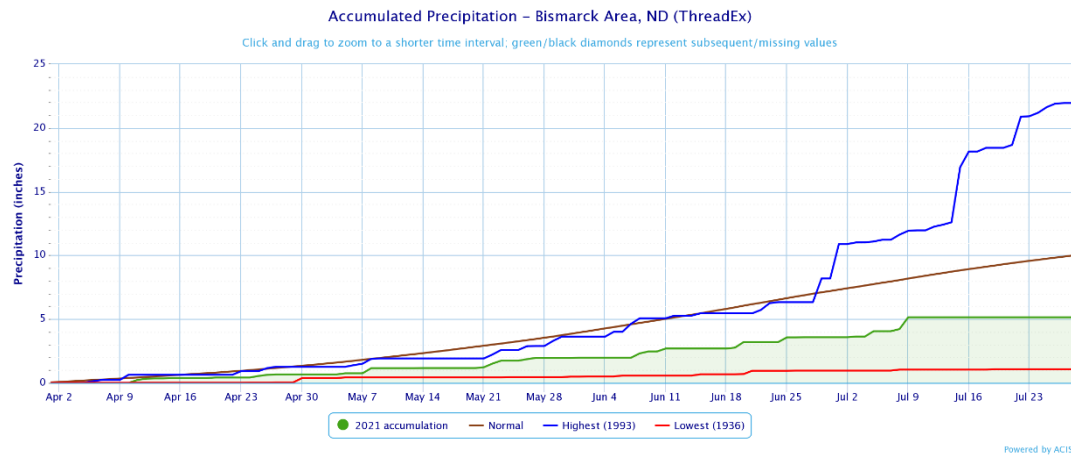
## Oct-Jun Temperature





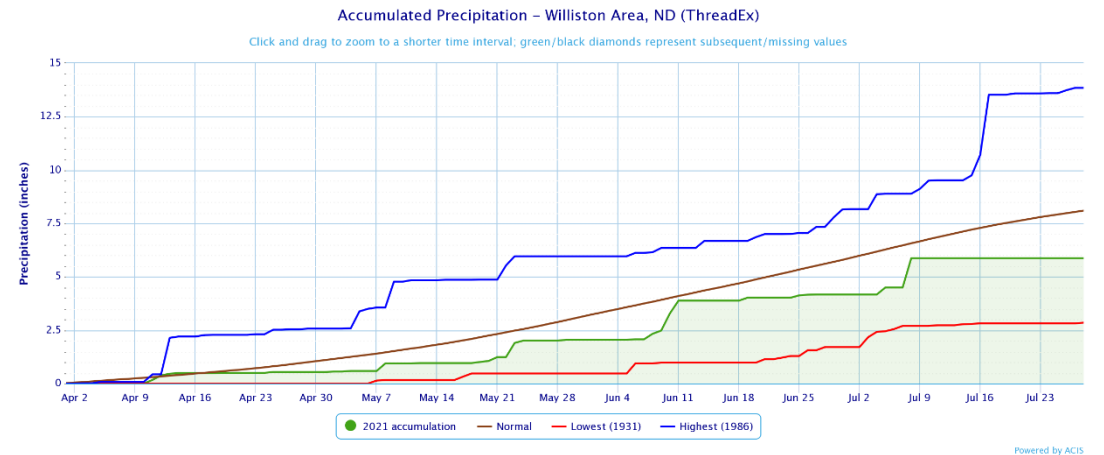
# Select City Precipitation Accumulation Deficits

## Bismarck (Growing Season Accumulation)



	Accumulation (in)
Oct 1 to date (Departure from normal; Ranking)	5.13 (-4.86)
Ranking	9th Driest since 1873

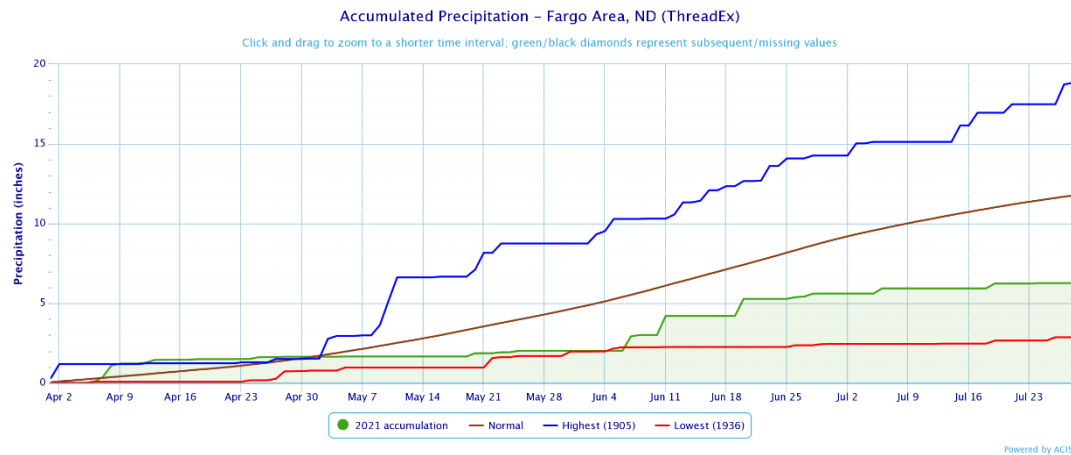
## Williston (Growing Season Accumulation)



	Accumulation (in)
Oct 1 to date (Departure from normal; Rank)	5.87 (-2.23)
Ranking	35th Driest since 1893

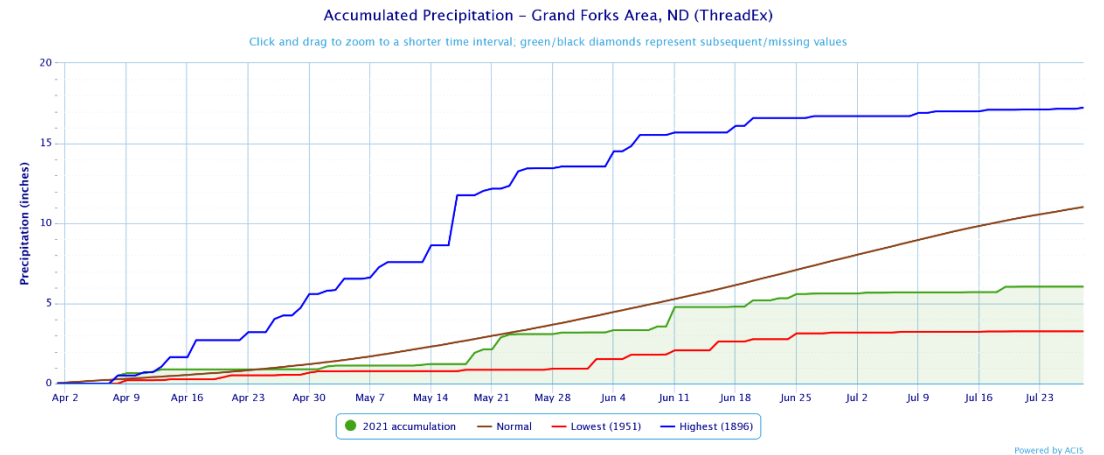
# Select City Precipitation Accumulation Deficits

## Fargo (Growing Season Accumulation)



	Accumulation (in)
Oct 1 to date (Departure from normal; Ranking)	6.26 (-5.49)
Ranking	16th Driest since 1881

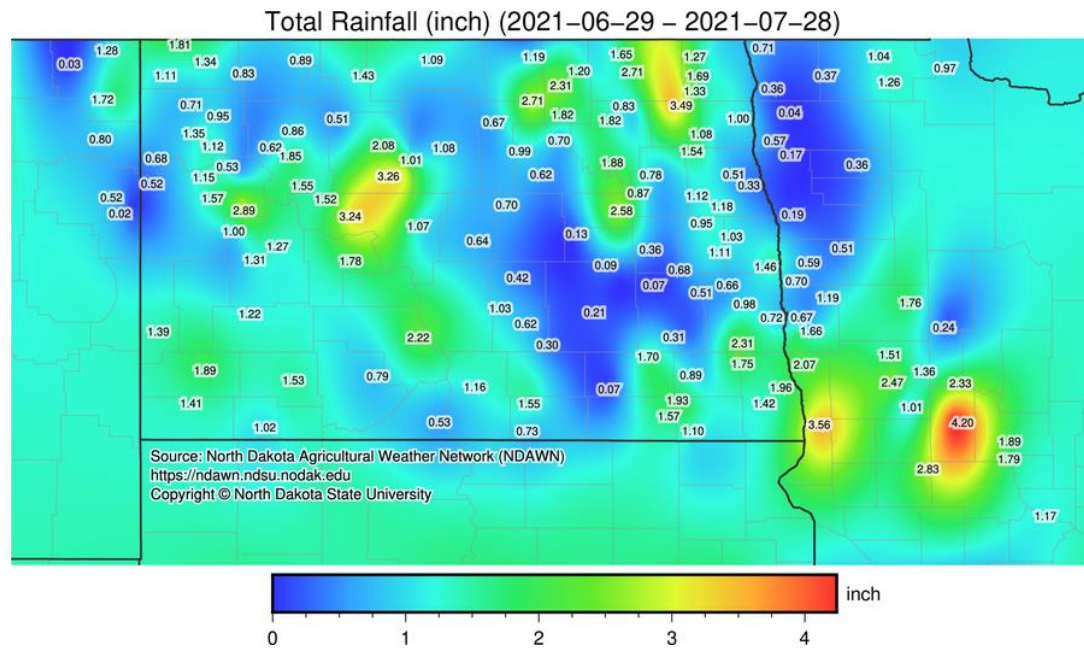
## Grand Forks (Growing Season Accumulation)



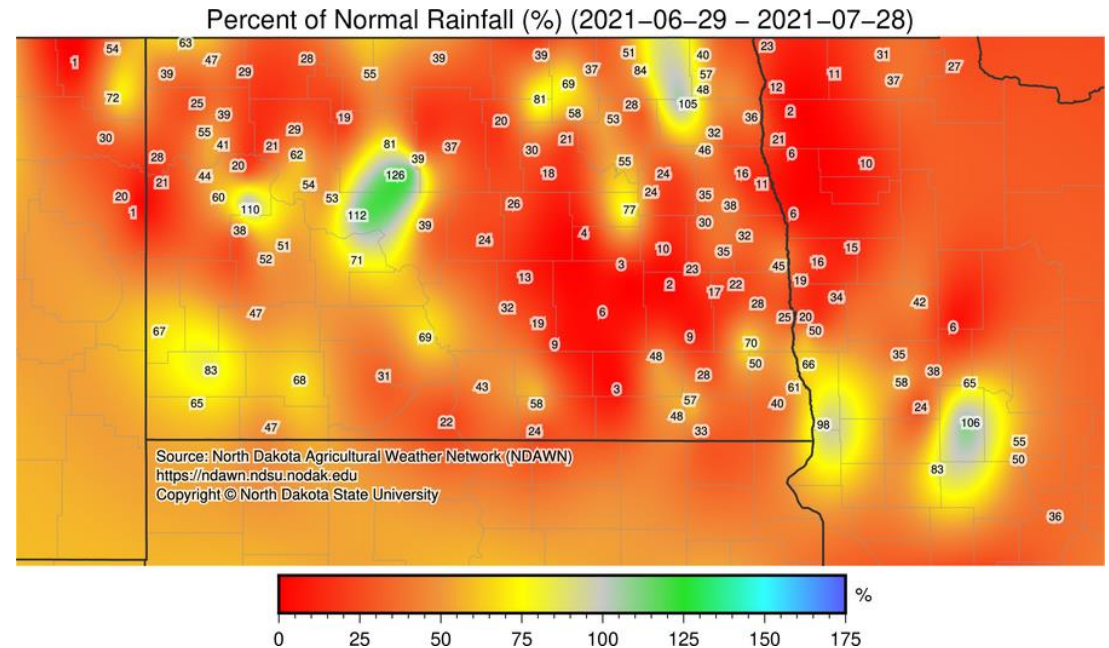
	Accumulation (in)
Oct 1 to date (Departure from normal; Rank)	3.26 (-7.77)
Ranking	10th Driest since 1892

# Last 30-Day Precipitation

## Total Accumulation

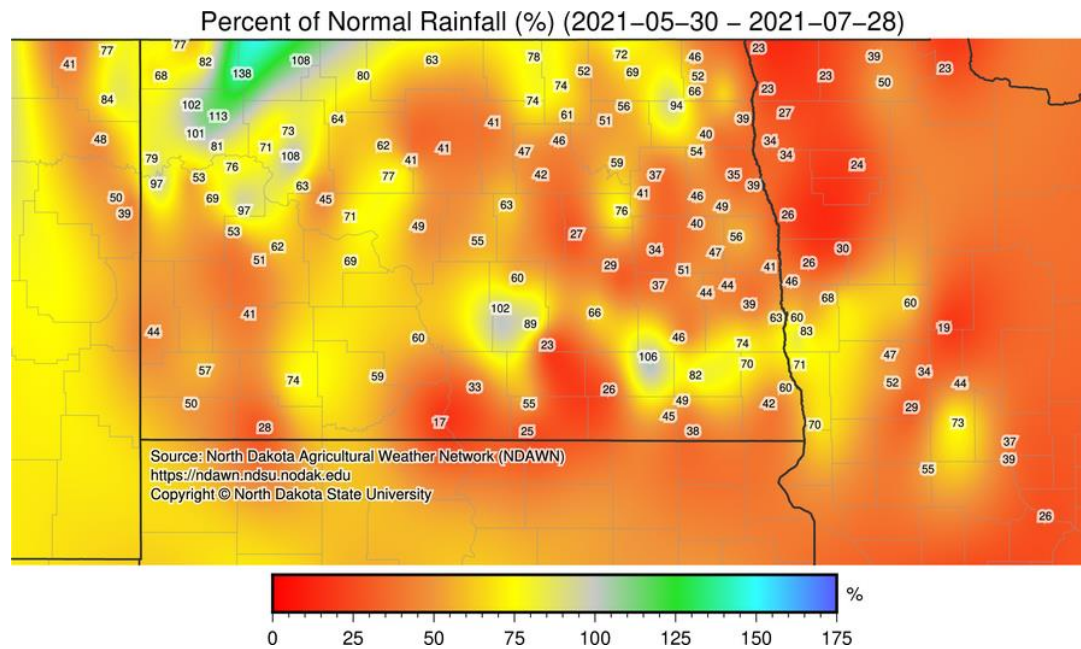


## % of Normal

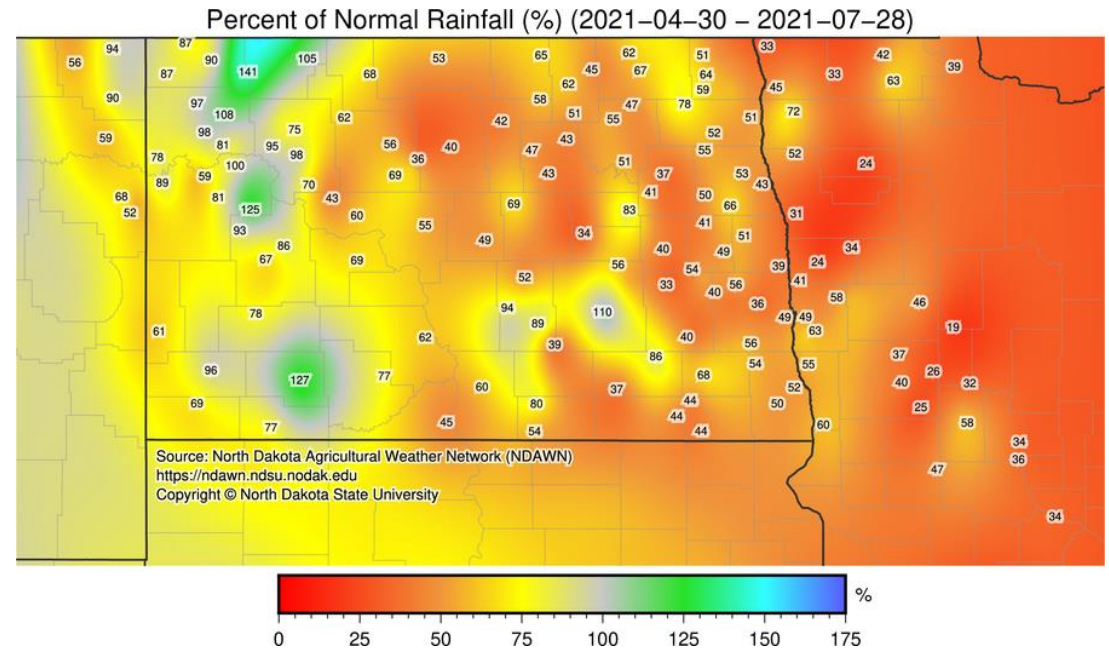


# Long Term Precipitation % of Normal

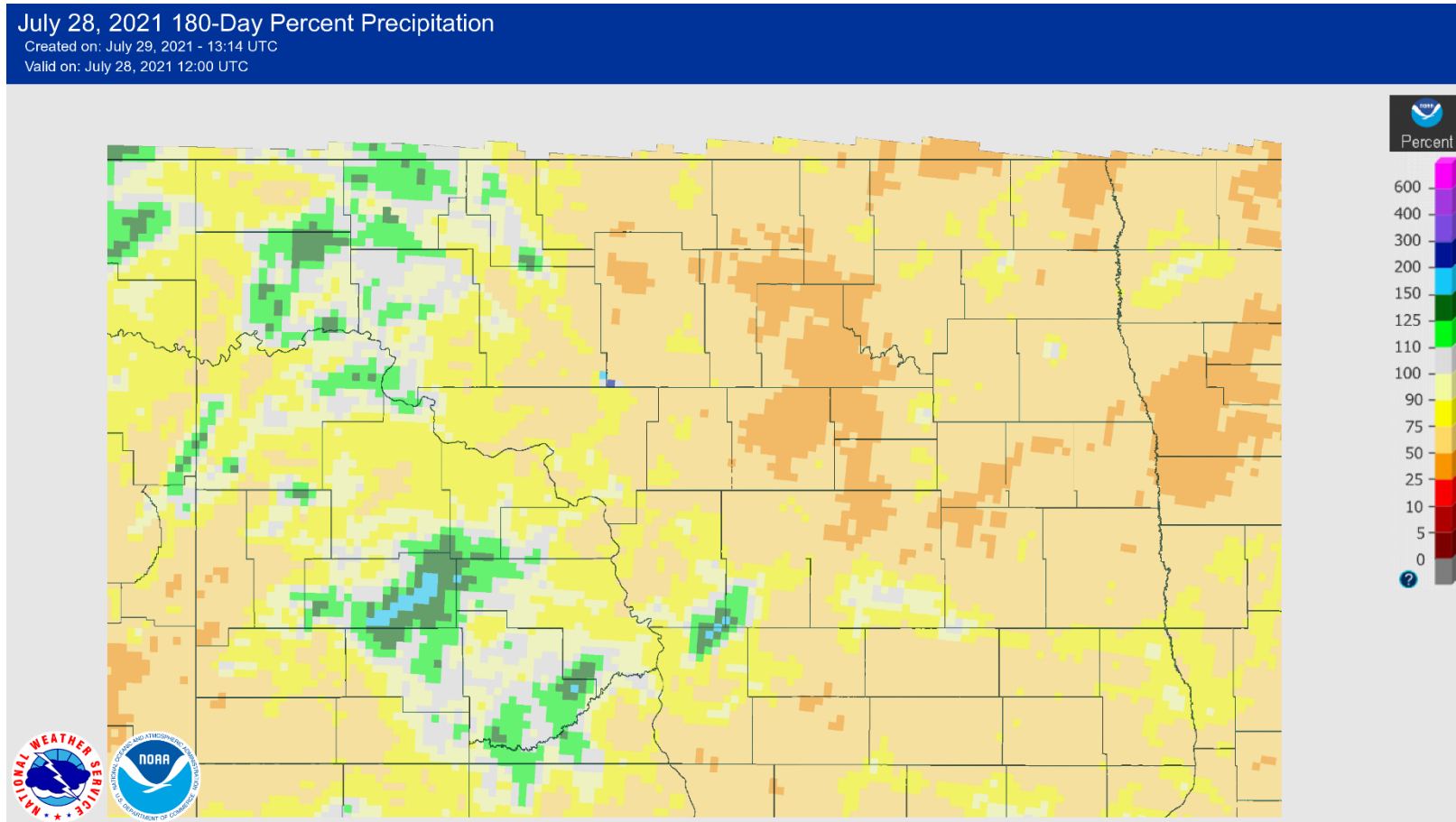
## Last 60 Days



## Last 90 Days



# 6-Month Precipitation % of Normal



AHPS: <https://water.weather.gov/ahps/>



Cumulative % area  
(% Weekly Change)

# U.S. Drought Monitor North Dakota

July 27, 2021

(Released Thursday, Jul. 29, 2021)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	97.78	52.28	10.37
Last Week 07-20-2021	0.00	100.00	100.00	96.70	48.58	8.21
3 Months Ago 04-27-2021	0.00	100.00	97.84	92.99	82.65	0.00
Start of Calendar Year 12-29-2020	0.00	100.00	83.68	59.44	6.82	0.00
Start of Water Year 09-29-2020	15.13	84.87	51.84	13.94	0.00	0.00
One Year Ago 07-28-2020	51.30	48.70	11.92	0.00	0.00	0.00

## Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

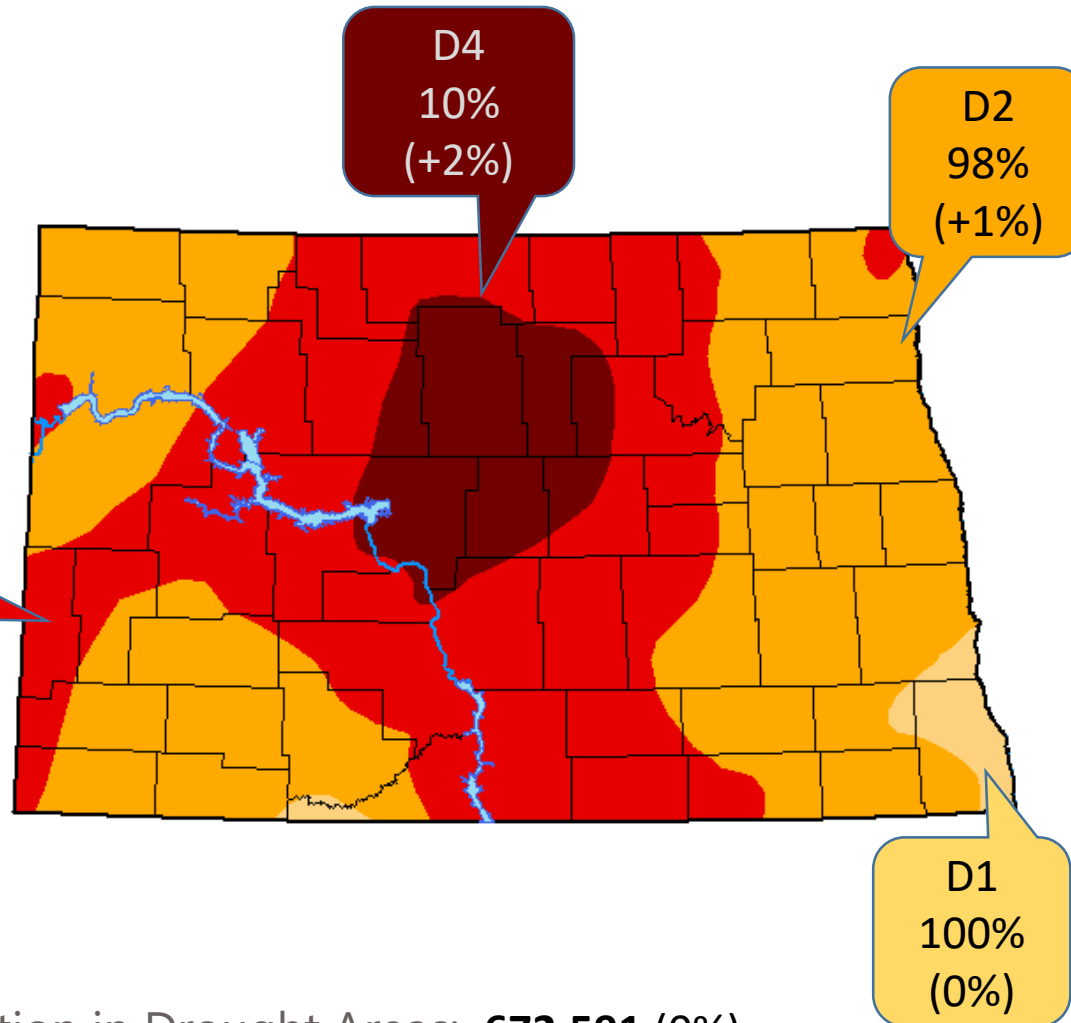
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

## Author:

Brad Rippey  
U.S. Department of Agriculture



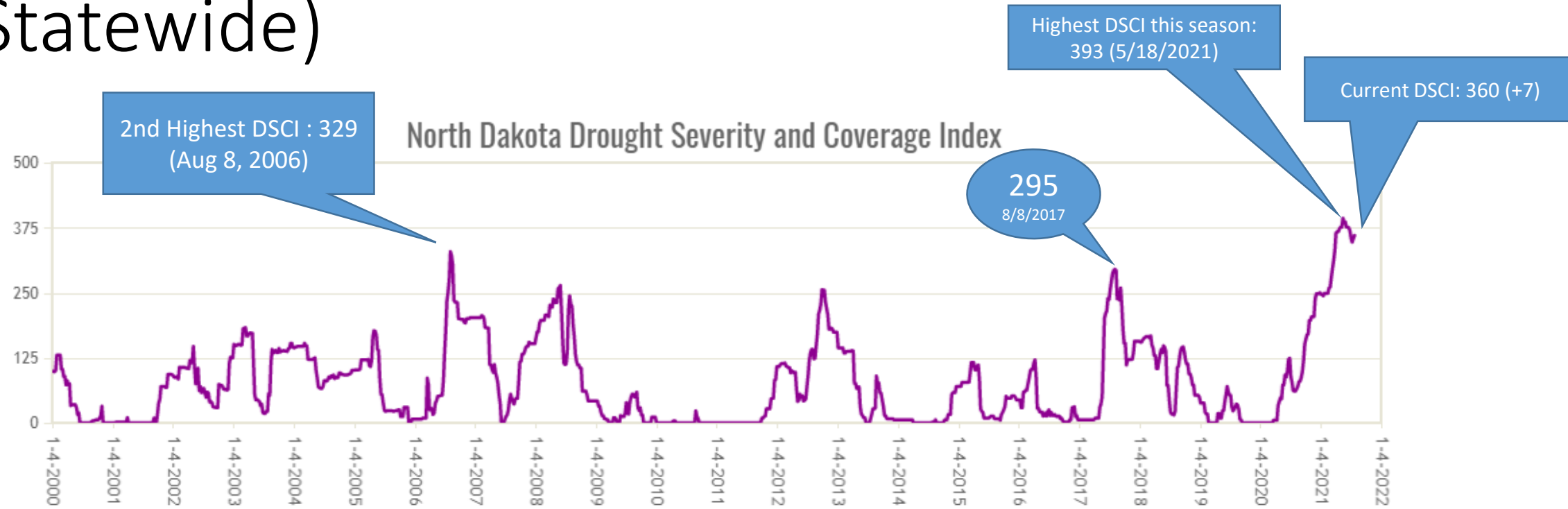
[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



Estimated Population in Drought Areas: **672,591** (0%)

(Weekly change)

# Drought Severity and Coverage Index (Statewide)

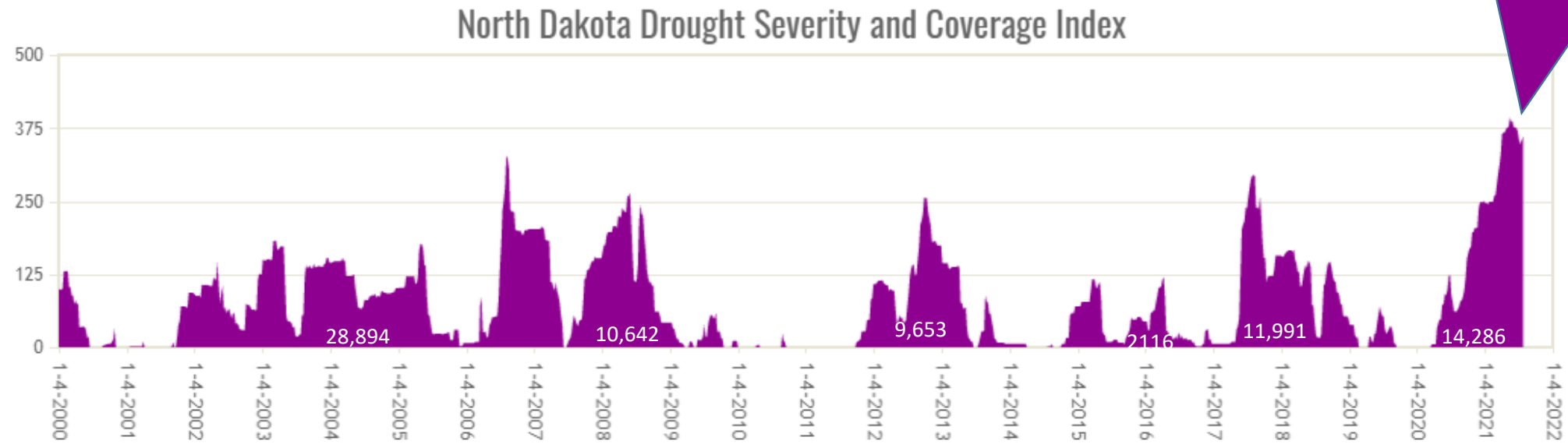


$$\text{Drought Severity and Coverage Index} = A_{D0} + 2A_{D1} + 3A_{D2} + 4A_{D3} + 5A_{D4} \quad (\text{Akyüz, 2007})$$

Where: A is a % of the state covered under the corresponding D-severity

# Statewide Accumulated Drought Severity and Coverage

ADSCI for the Current Season: 13,925  
62-week Accumulation since 5/19/2020



Numbers indicate the area under the DSCI Curve (Accumulated DSCI\*) which is directly correlated with the accumulated drought impact in the state.

\*DSCI values are accumulated since the first week the drought category is at last D1 anywhere in the state.

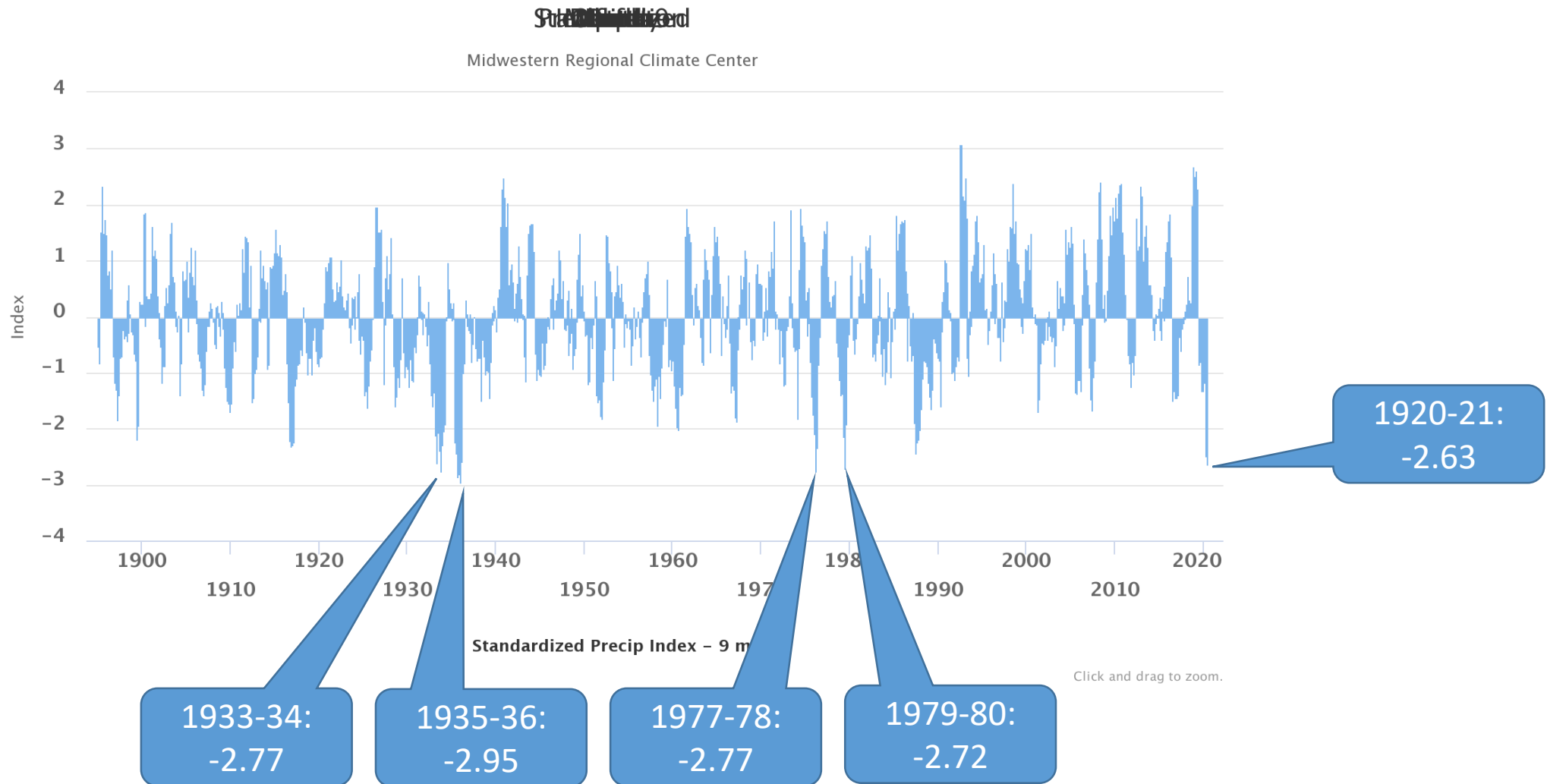


# ND Drought Economic Impact

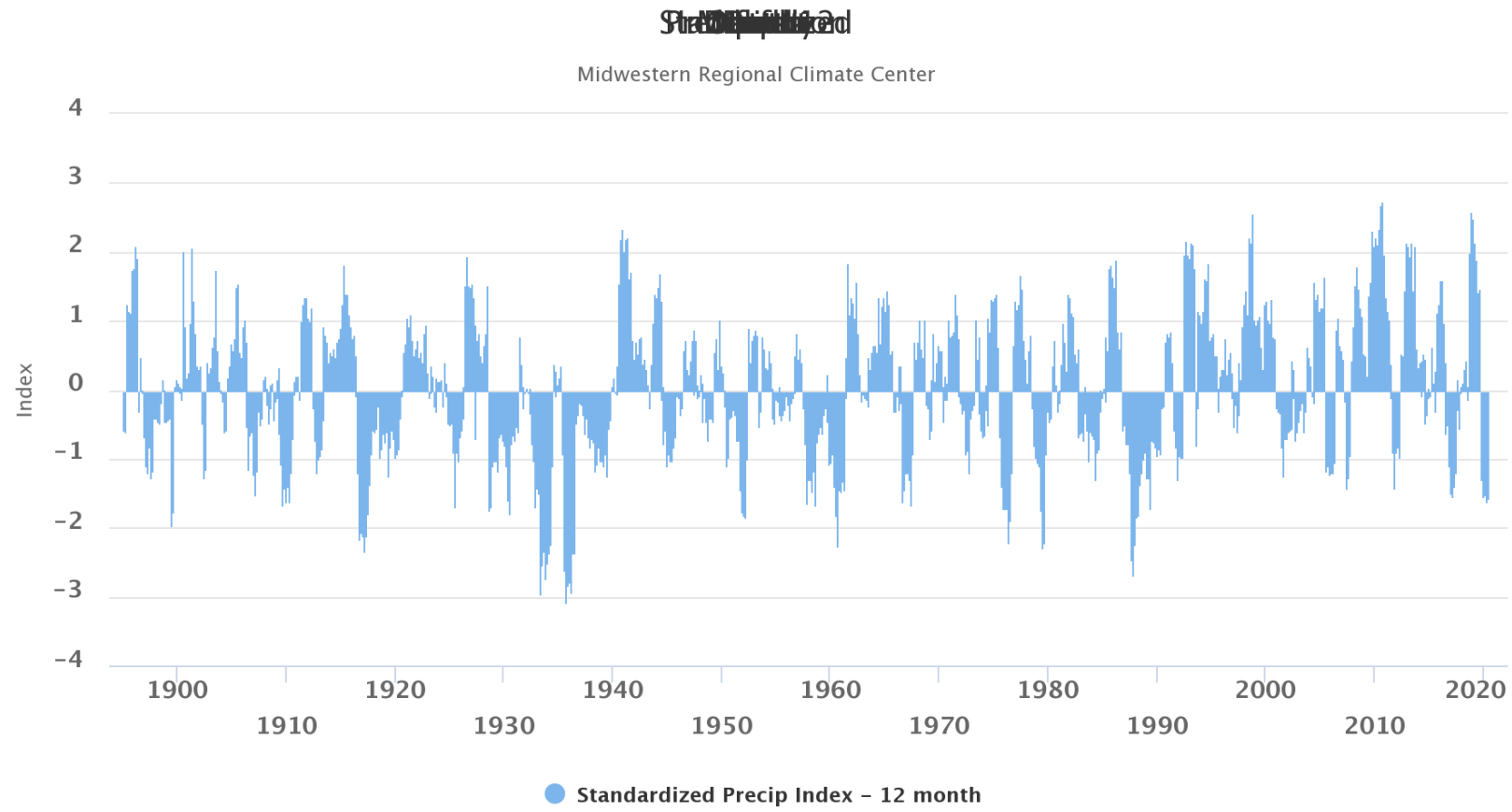
\*NOAA Billion-Dollar Weather and Climate Disasters Database

	Event	Economic Impact Rank	CPI Adjusted Estimated Cost (in Billions)*	Total Cost (if Multi-year Drought)
	1980	2	\$5-10	
→	1988	1	\$5-10	
	1989	5	\$0.5-1	\$5.5-11 (1988-89 Drought)
	2002	8	\$0.25-0.5	
	2003	11	\$0.25-0.5	\$0.5-1
→	<b>2006</b>	<b>6</b>	<b>\$0.5-1</b>	<b>\$1-1.5</b>
	2008	4	\$0.5-1	
	2012	10	\$0.25-0.5	
	2013	7	\$0.5-1	\$0.75-1.5
	2017	3	\$1-2	
	2020	9	\$0.25-0.5	
→	<b>2021</b>		<b>\$</b>	<b>\$</b>

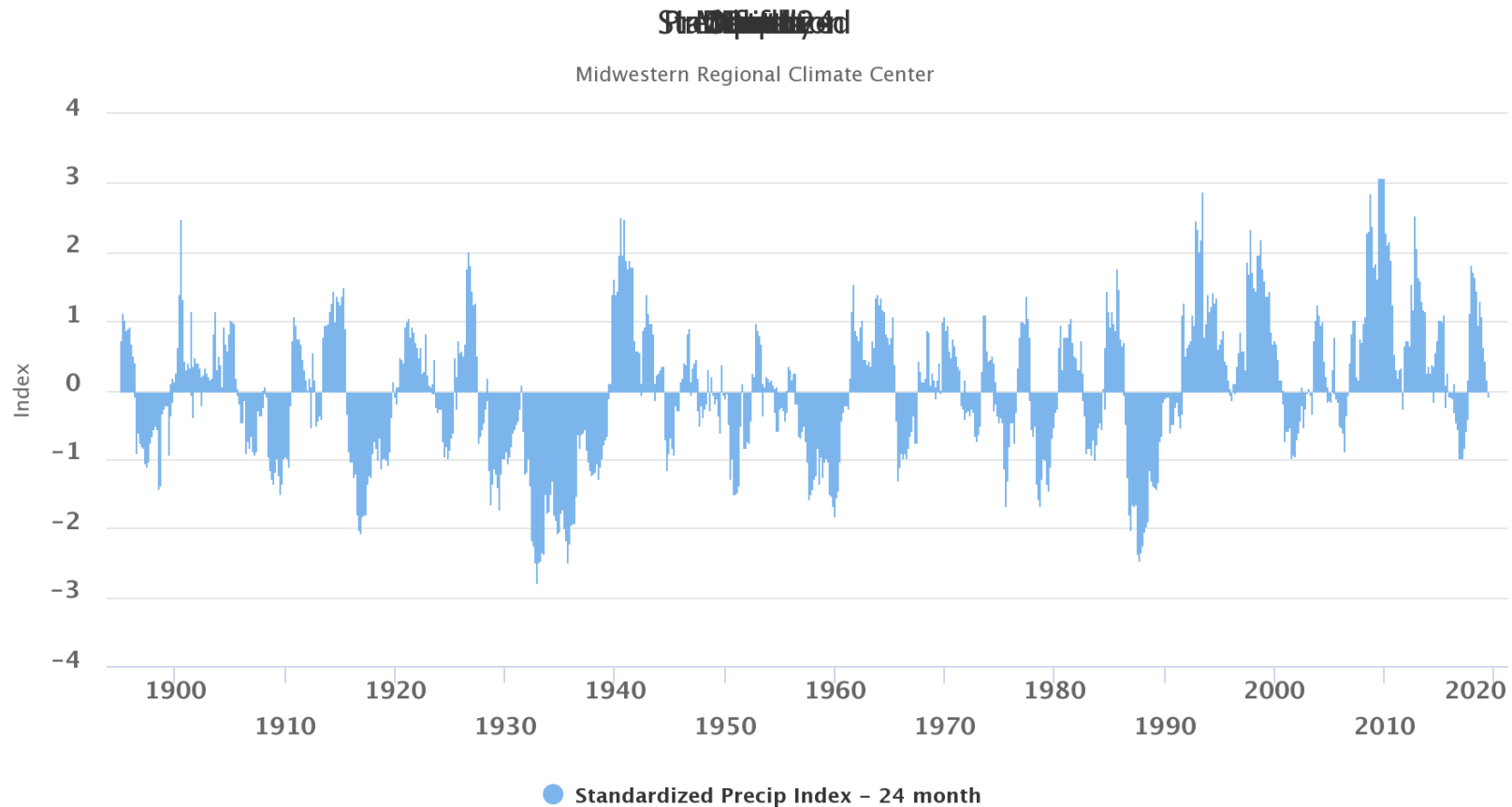
# 9-Month SPI



# 12-Month SPI



# 24-Month SPI: Are we getting into another Mega-Year Drought Period?

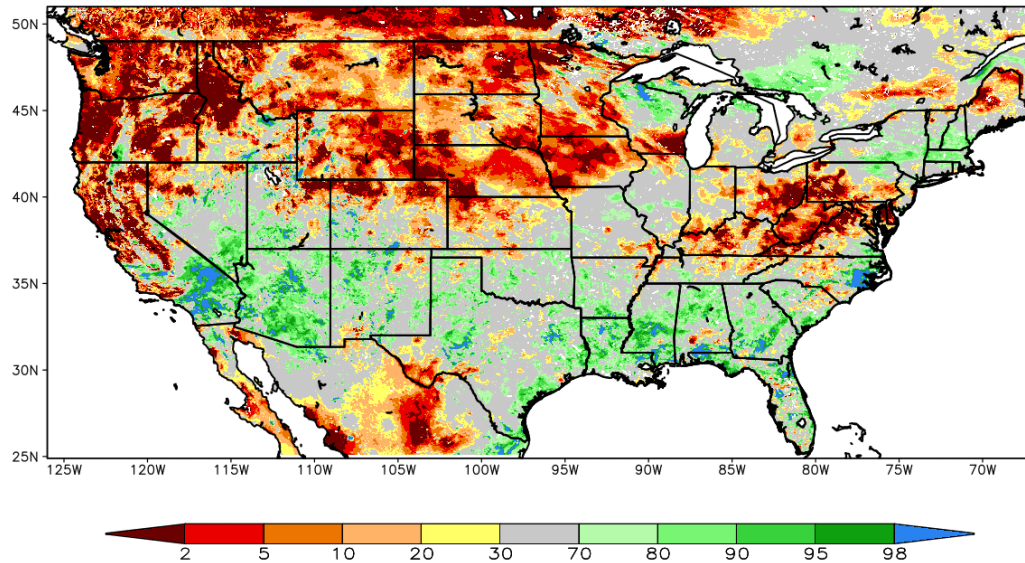


# Soil Moisture Ranking Percentile

Short-term Prediction Research and Transition Center: Real-time 3km Land Information System

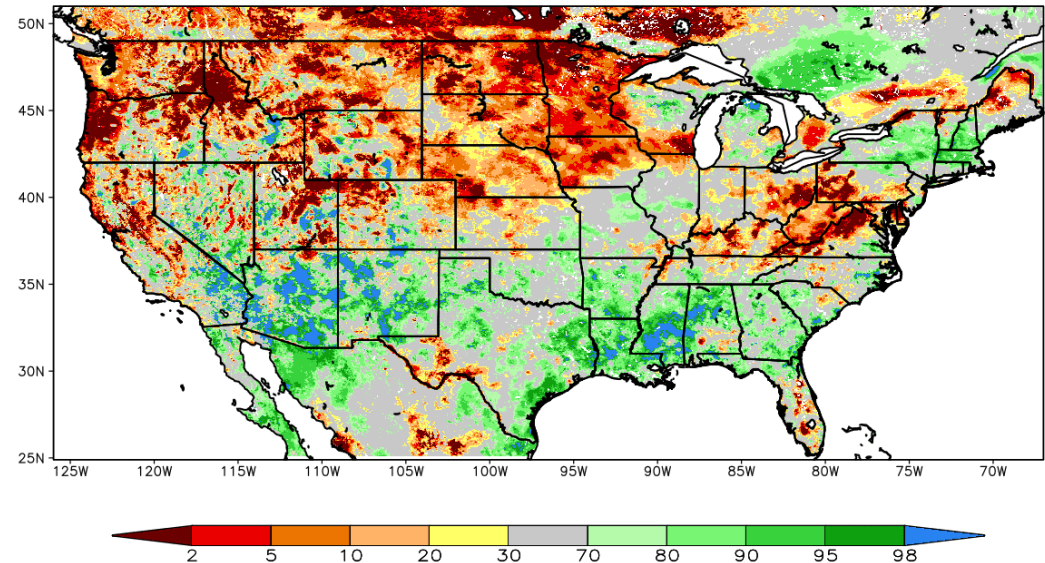
**0-10 cm (Surface to 4")**

SPoRT-LIS 0-10 cm Soil Moisture percentile valid 29 Jul 2021



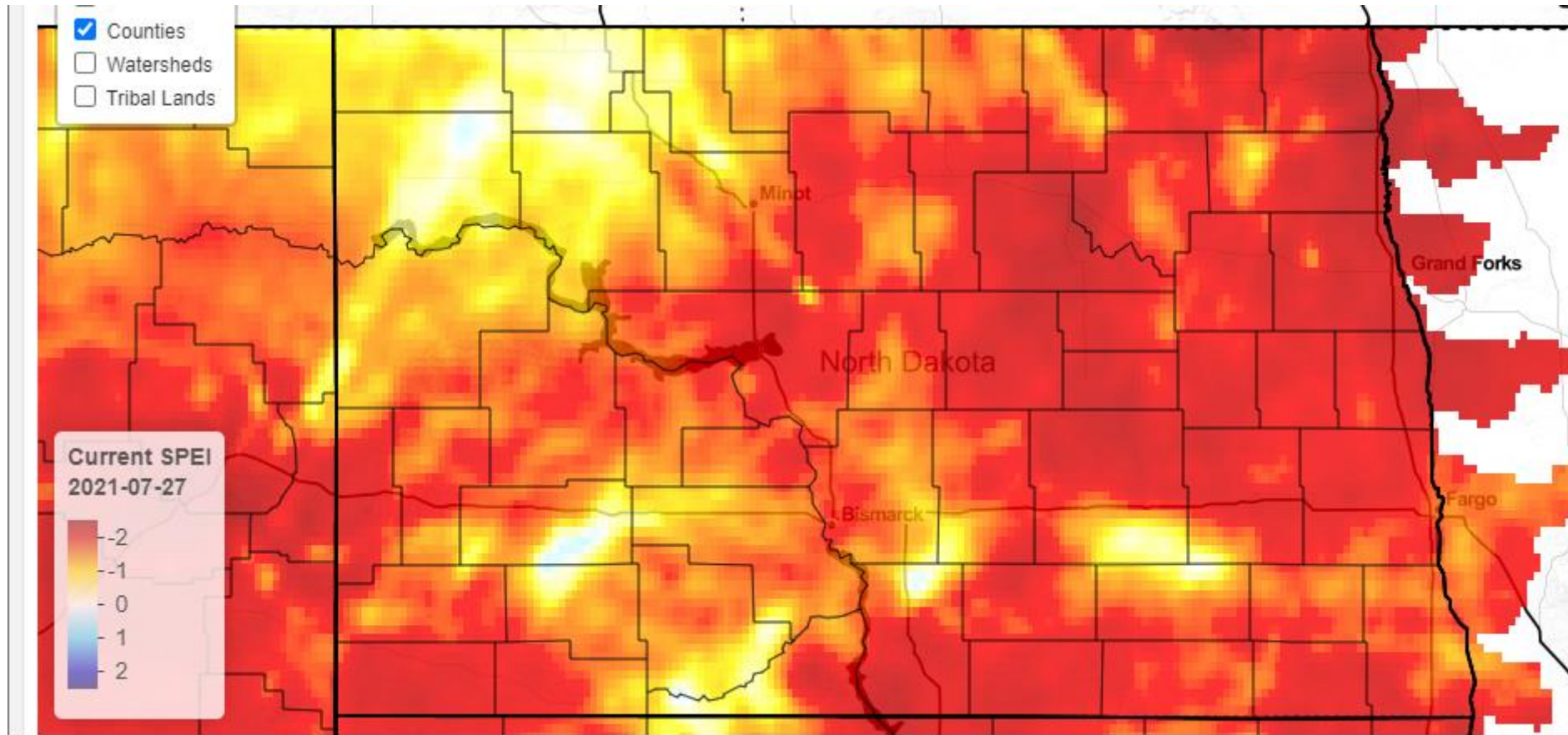
**0 to 100 cm (Surface to 3')**

SPoRT-LIS 0-100 cm Soil Moisture percentile valid 29 Jul 2021



[https://weather.msfc.nasa.gov/sport/case\\_studies/lis\\_CONUS.html](https://weather.msfc.nasa.gov/sport/case_studies/lis_CONUS.html)

# 90-Day Standard Precipitation Evapotranspiration Index (SPEI)

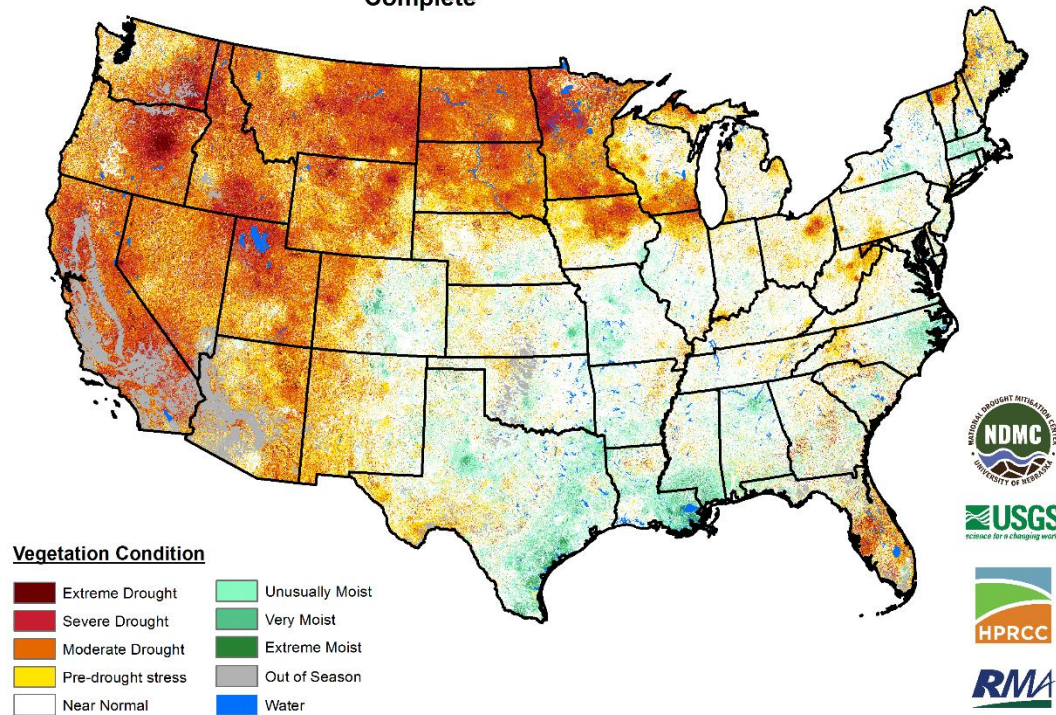




# Vegetation Drought Response Index

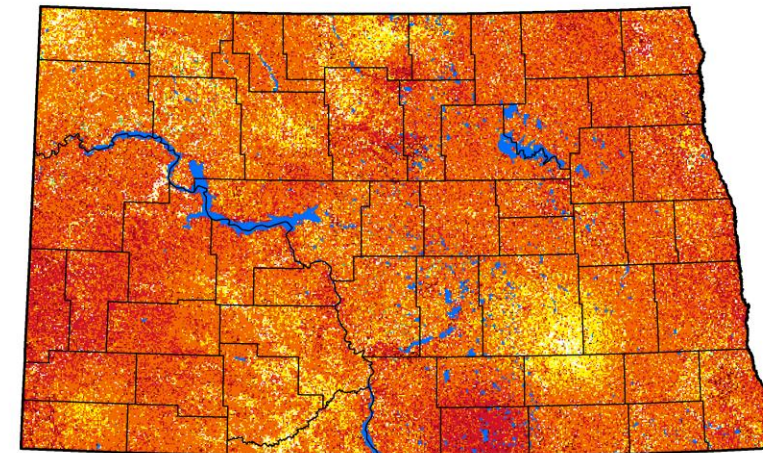
**Vegetation Drought Response Index**  
Complete

July 25, 2021



**Vegetation Drought Response Index**  
Complete: North Dakota

July 25, 2021



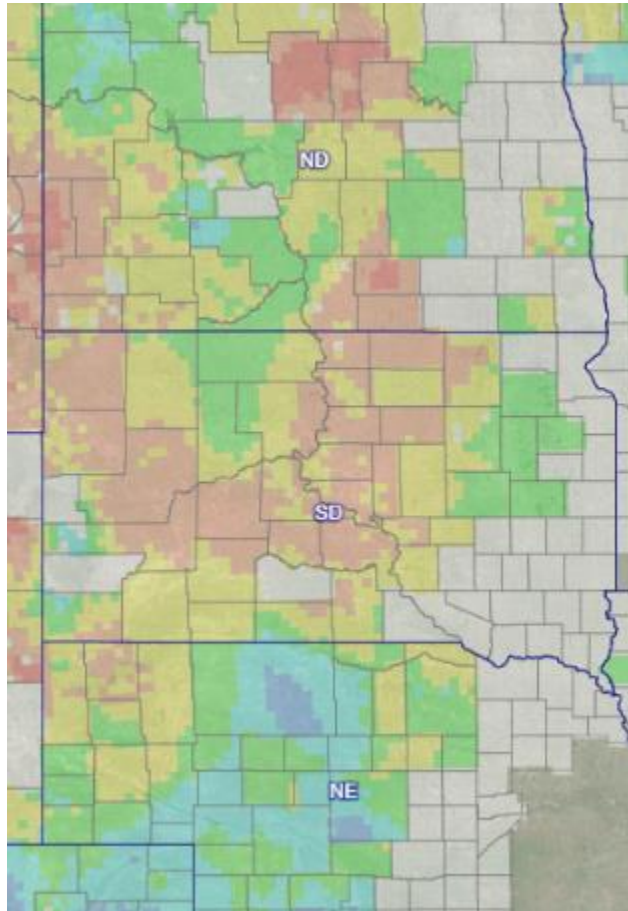
**Vegetation Condition**



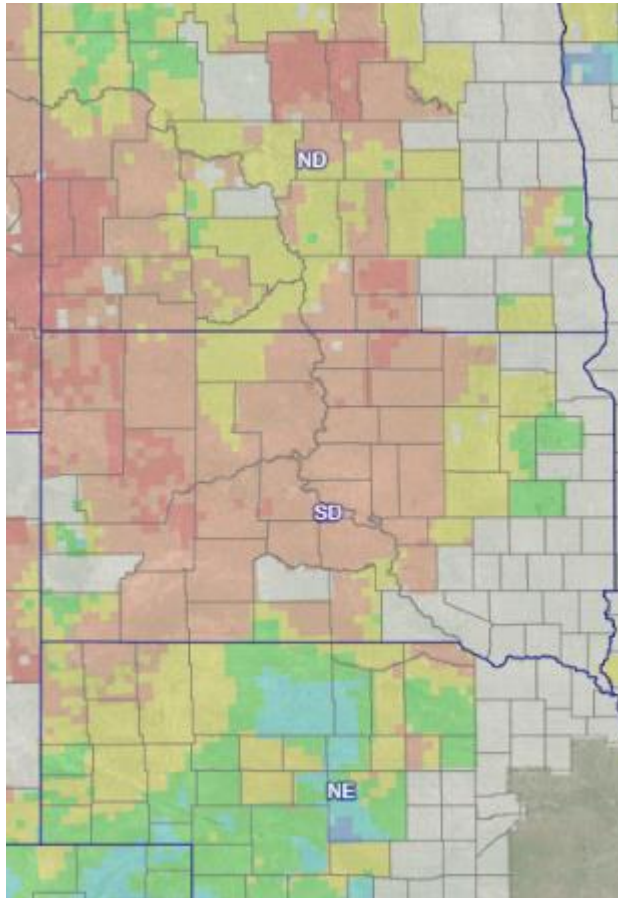
Grass-Cast: Made: July 13, 2021

## % Change in Grassland Production Forecast for Your Area through August 31 Compared to Its 38-yr Average

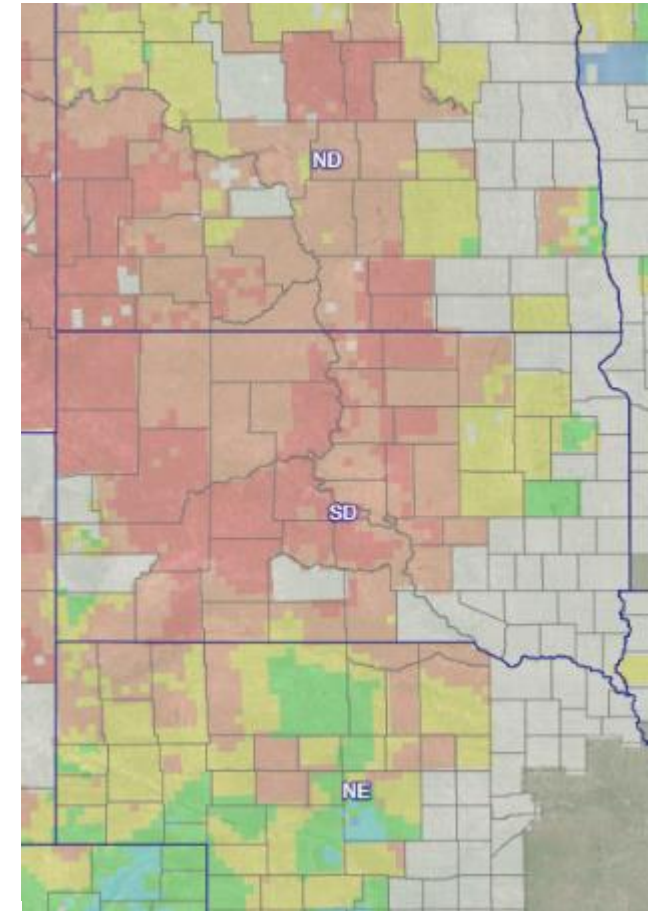
Assuming **ABOVE** Normal Precipitation  
through August 31



Assuming **NEAR** Normal Precipitation  
through August 31



Assuming **BELOW** Normal Precipitation  
through August 31



Percent (%)

< -30  
-30 to -15

-15 to -5  
-5 to +5

+5 to +15  
+15 to +30

> +30  
No Data



# Countywide Impacts

CD7 (Slope): Our drought conditions are very severe here. We have never seen the Little Missouri River which we border, this low. The area 30 miles east of us is better than here. These are the worst conditions of drought we have ever had in this area. In addition to this we are being hit with an infestation of grasshoppers like never before.



Wheat field



Corn field



Hayfield

# Countywide Impacts

CD7 (Slope):



Moving cows to a different pasture



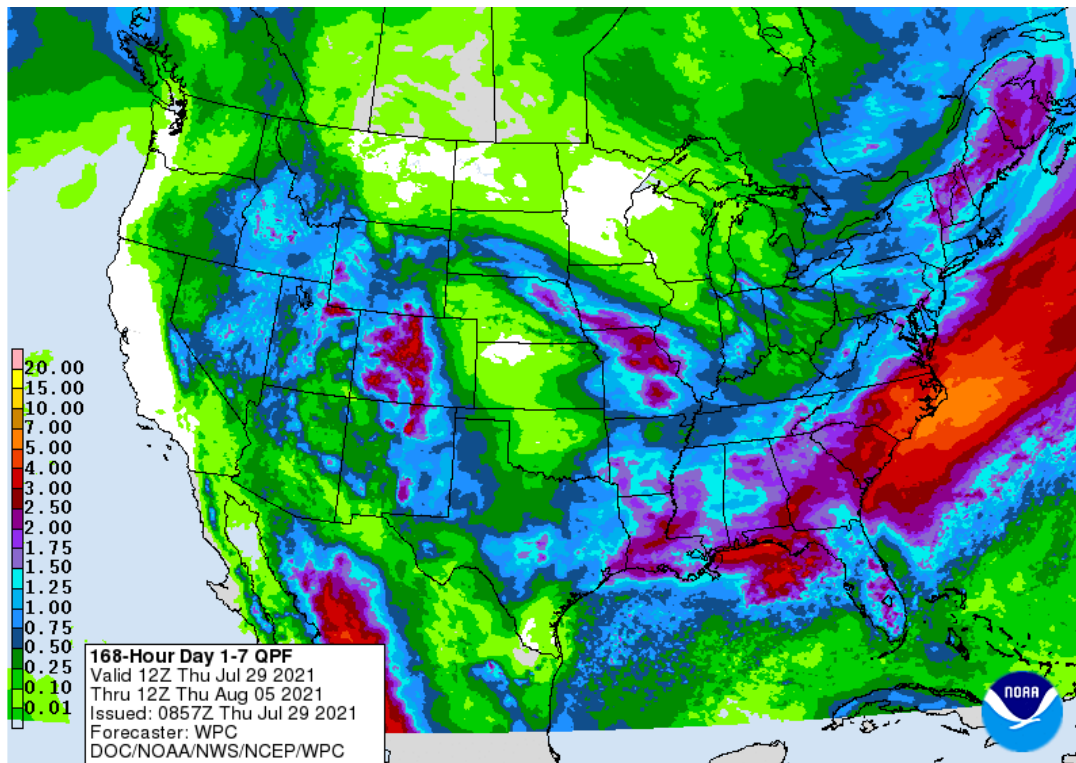
The Little Missouri River, hardly any water left in it. Pictures were taken on July 23, 2021.

Outlooks

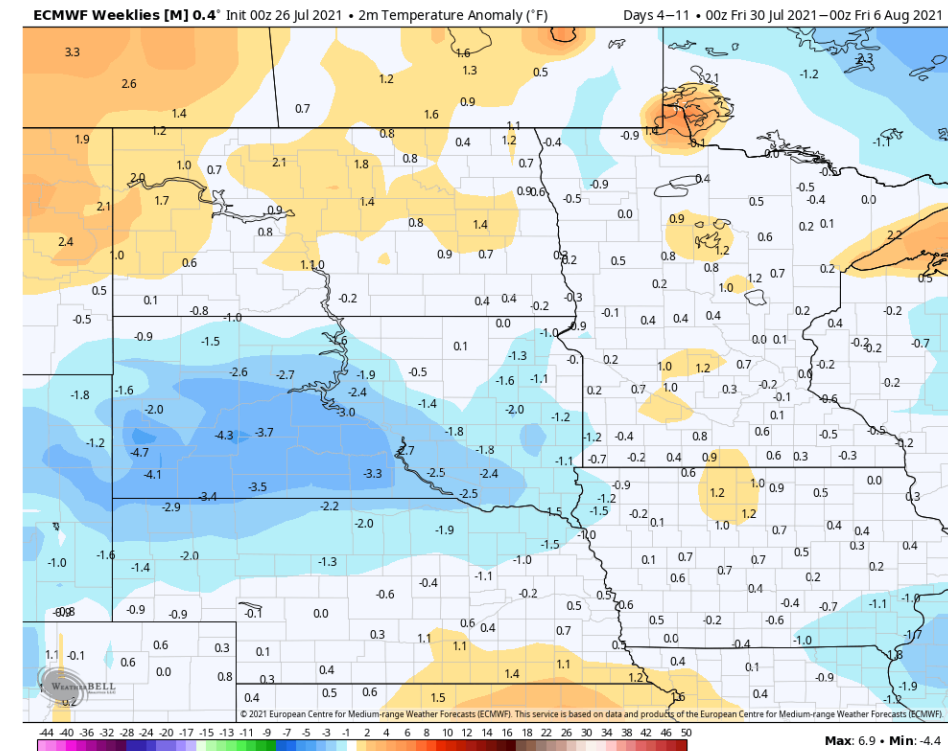


# 7-day:

## Precipitation: Through Thu 7am, Aug 5



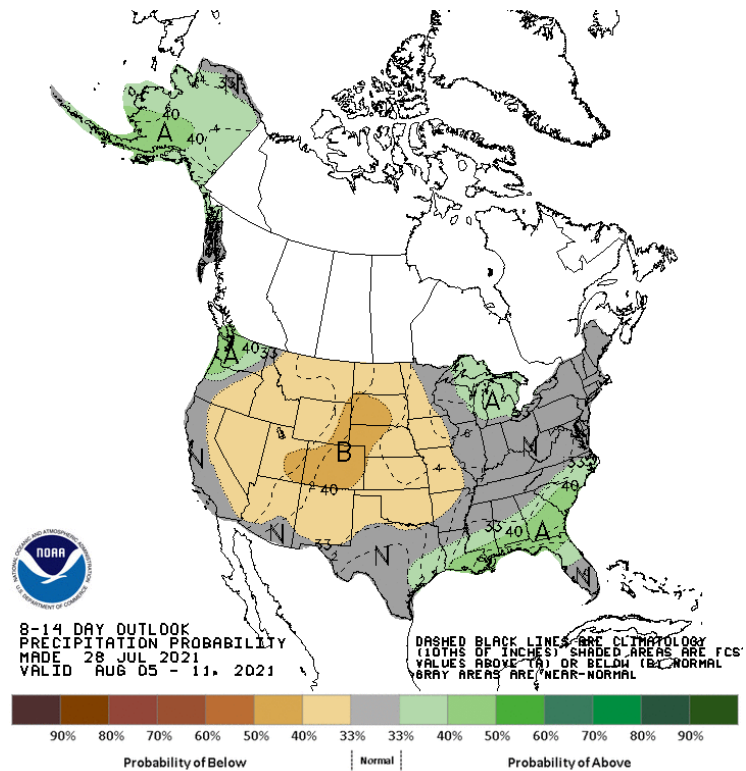
## Temperature Departure from Normal: Through Thu 7pm, Aug 5



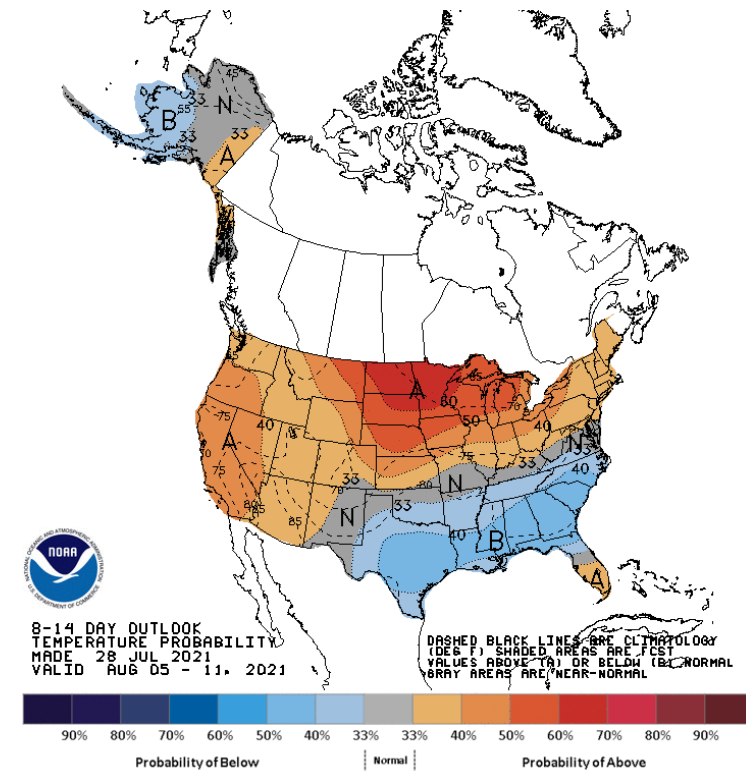
<https://www.wpc.noaa.gov/#page=qpf>

# 8-14 Day: August 5-11

## Precipitation

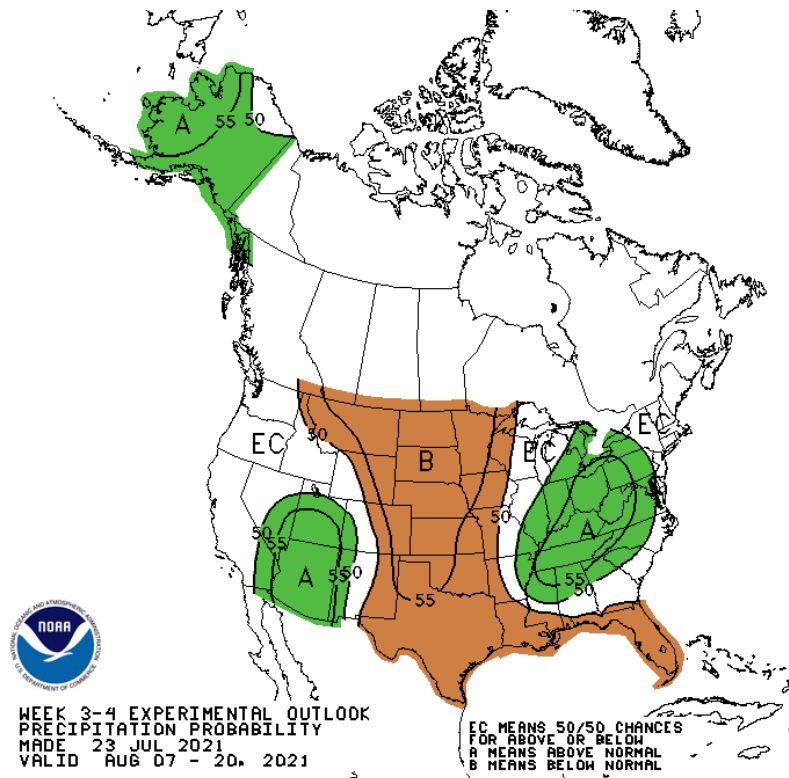


## Temperature

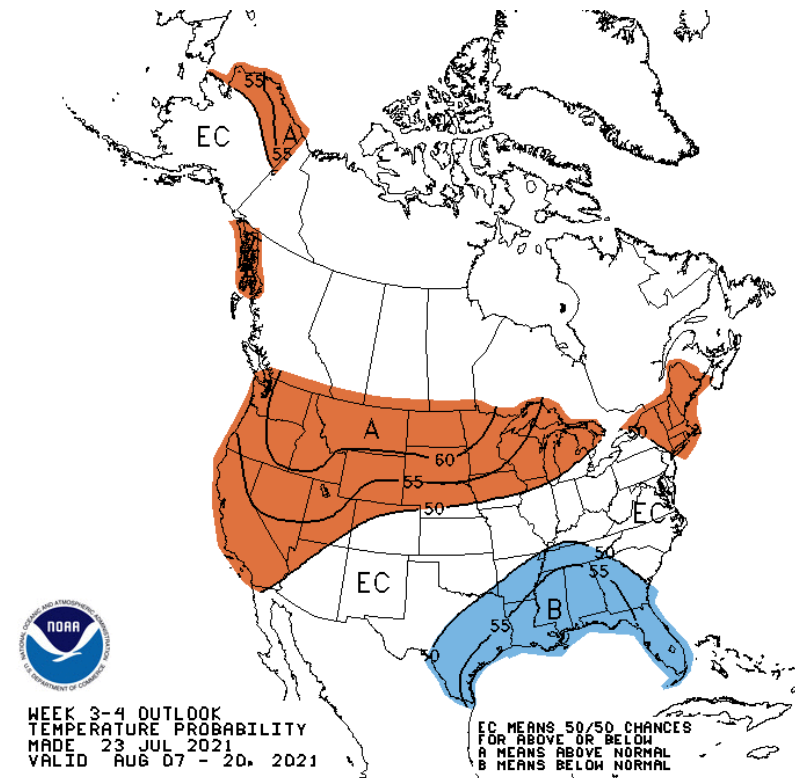


# Week 3 and 4: August 7-20

## Precipitation



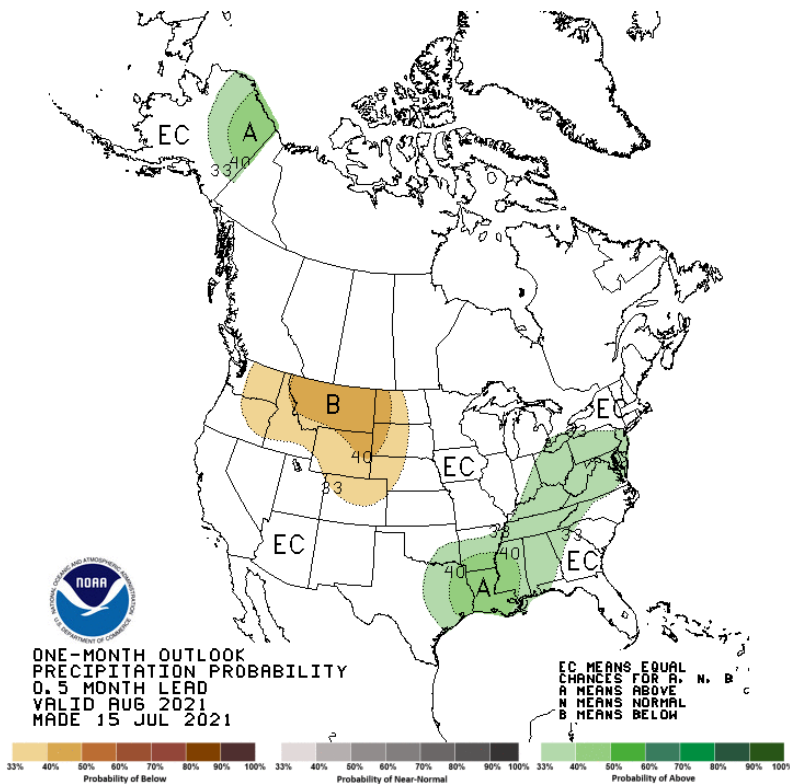
## Temperature



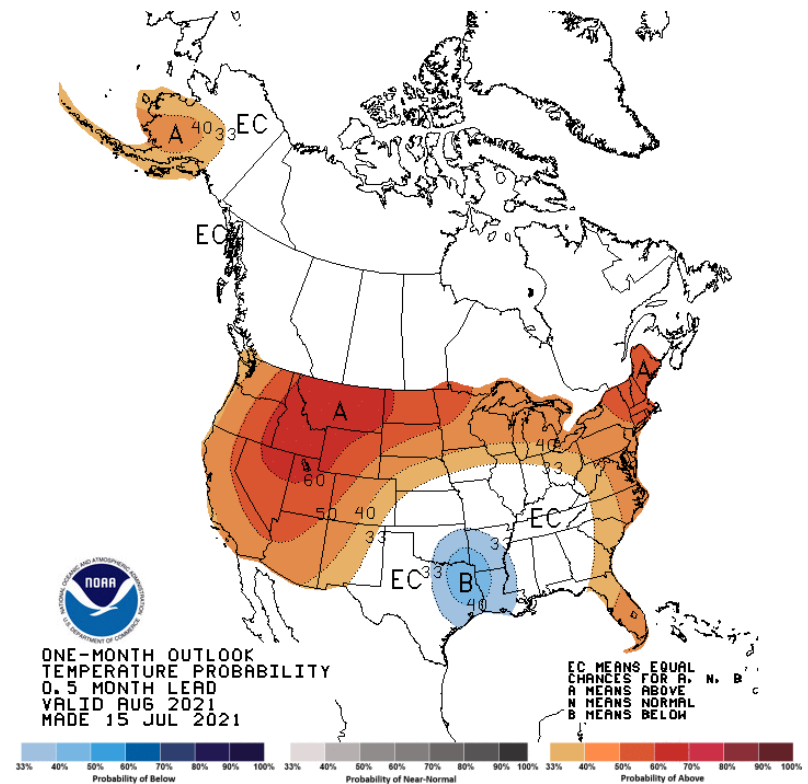
<https://www.cpc.ncep.noaa.gov/products/predictions/814day/>

# One-Month Outlook: August (Updated Jul 15)

## Precipitation

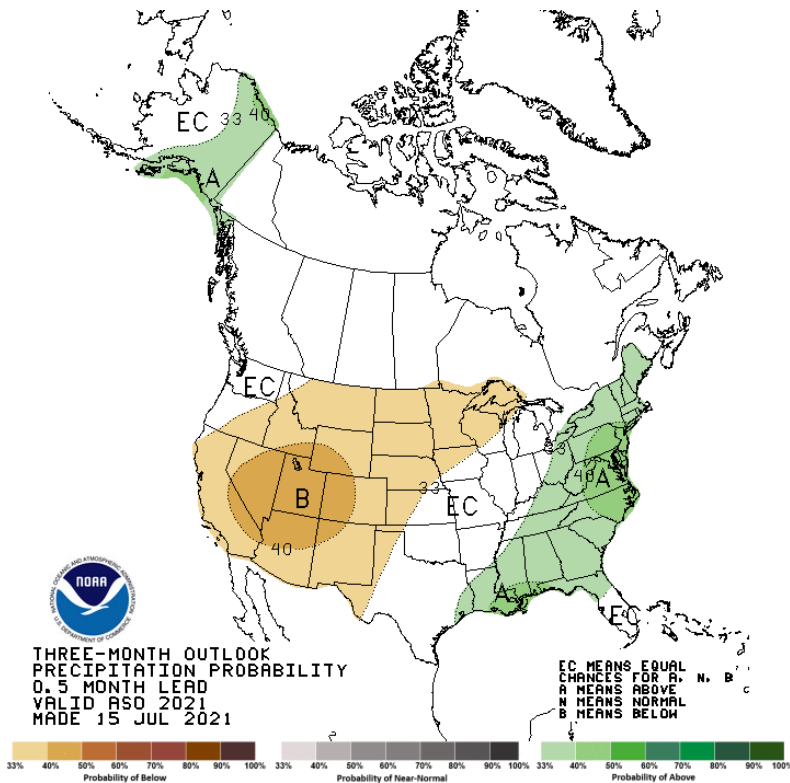


## Temperature

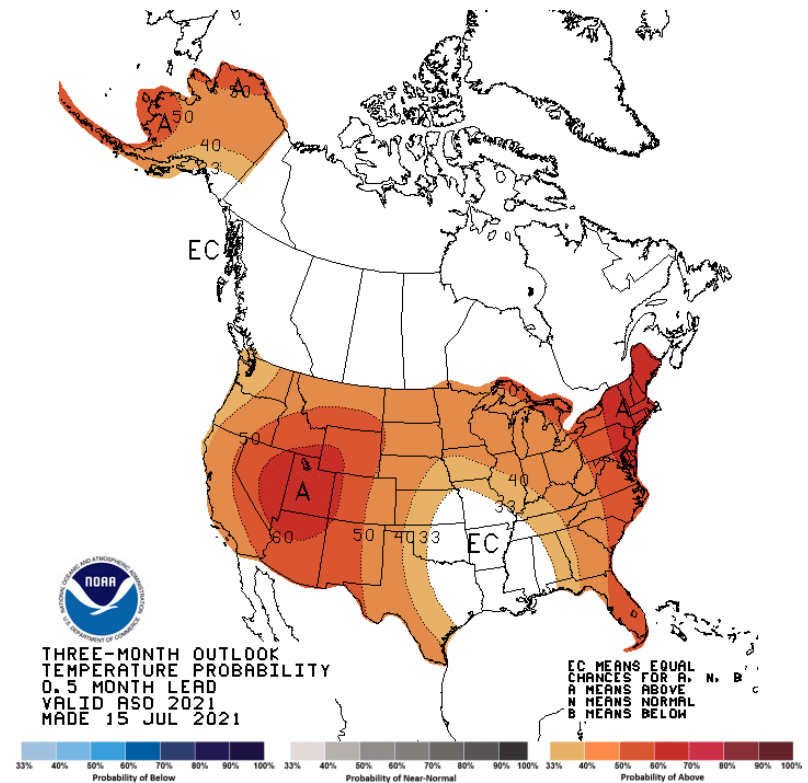


# Aug-Oct 2021 Outlook (Updated July 15)

## Precipitation



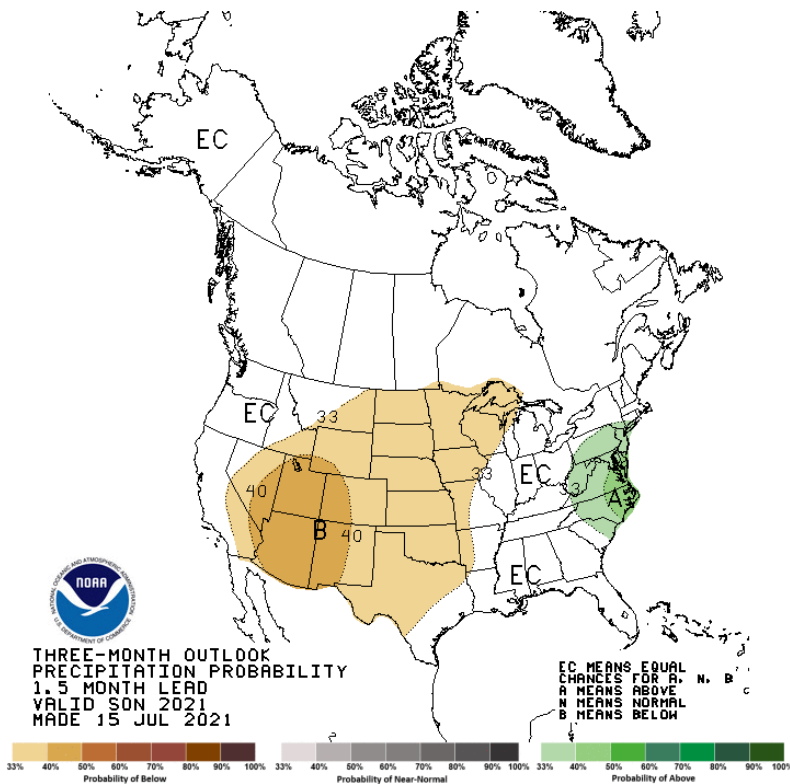
## Temperature





# Sep-Nov 2021 Outlook (Updated July 15)

## Precipitation



## Temperature

