

# **Oklahoma Drought Update:**

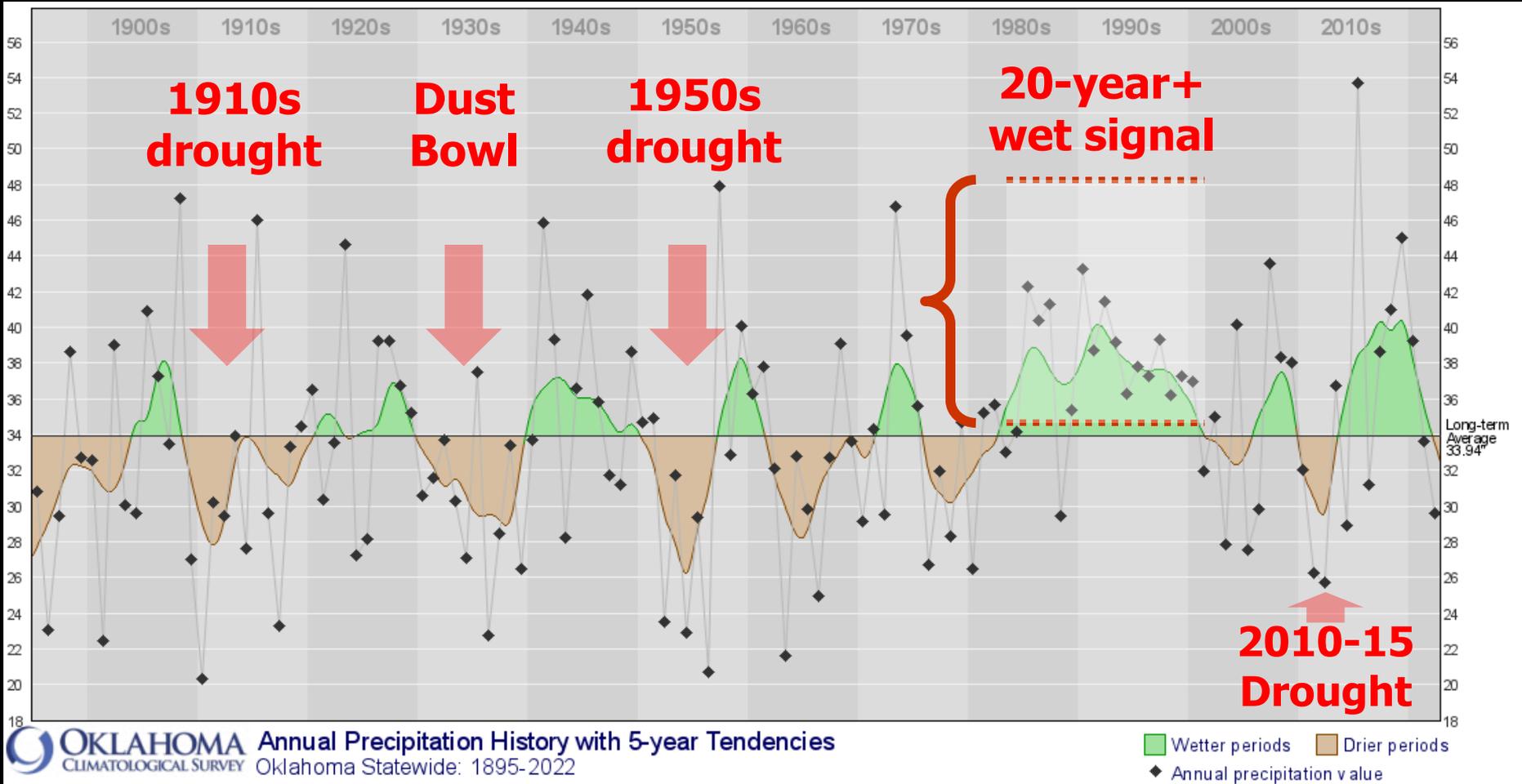
**August 15, 2023**

**Gary McManus  
Oklahoma Mesonet  
Oklahoma Climatological Survey**

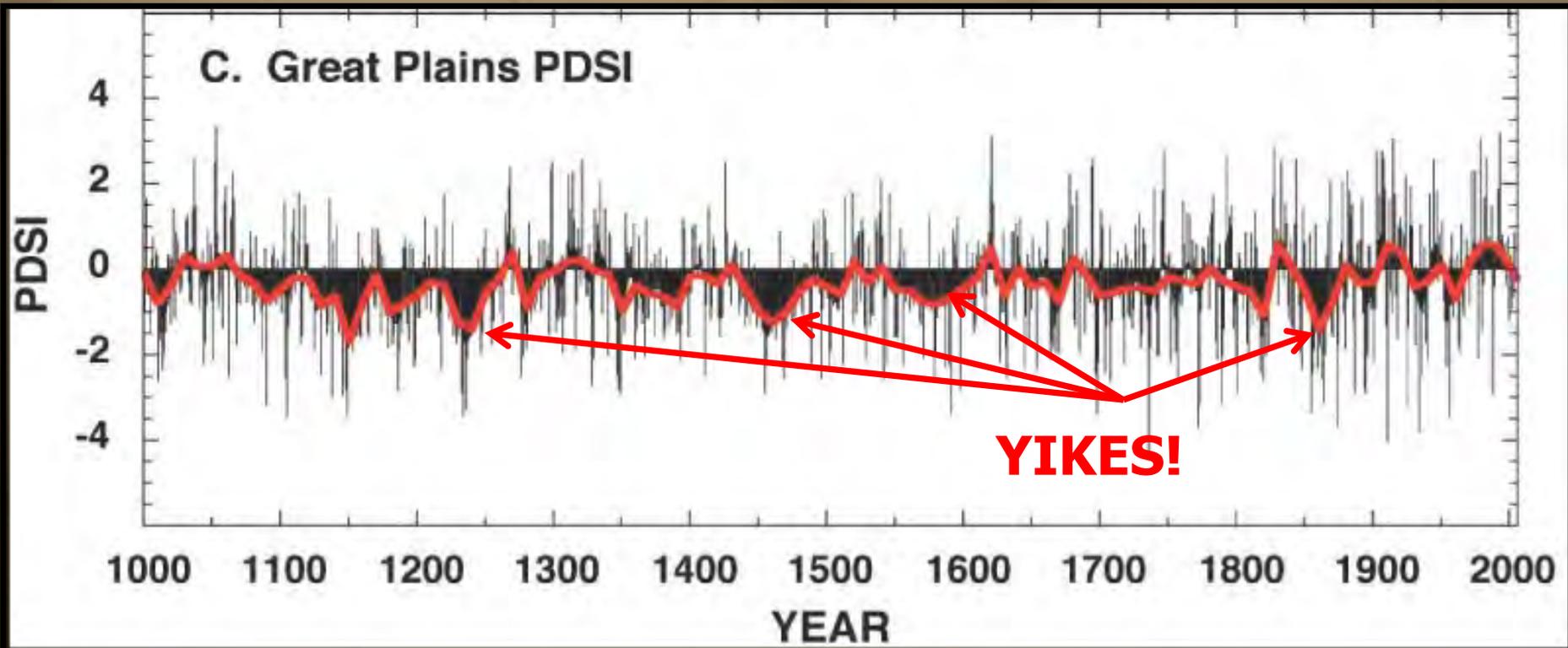
# A Brief History of Oklahoma Droughts



# The Biggies

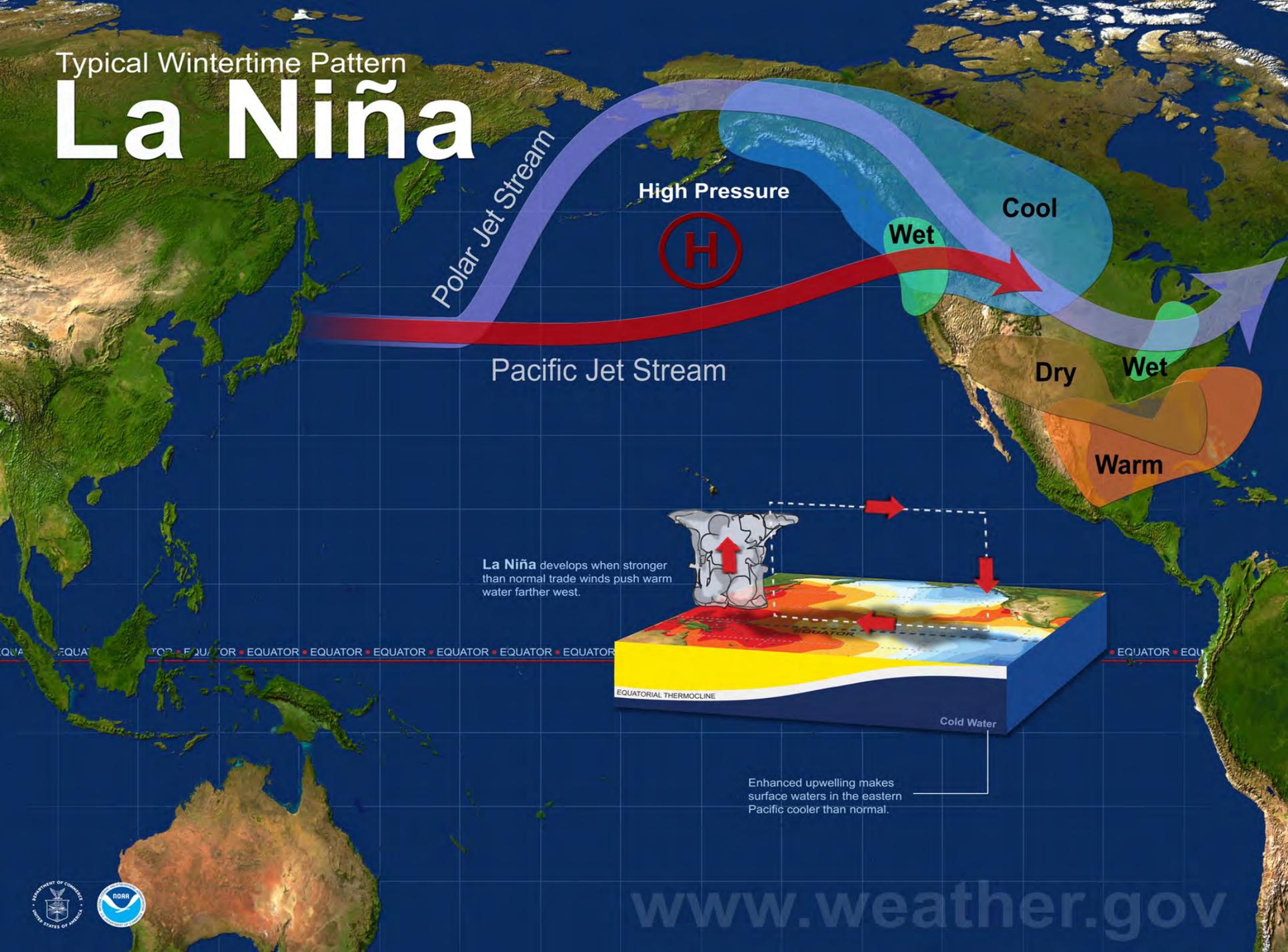


# A Bit Further Back



Typical Wintertime Pattern

# La Niña



High Pressure

H

Polar Jet Stream

Pacific Jet Stream

Wet

Cool

Dry

Wet

Warm

La Niña develops when stronger than normal trade winds push warm water farther west.

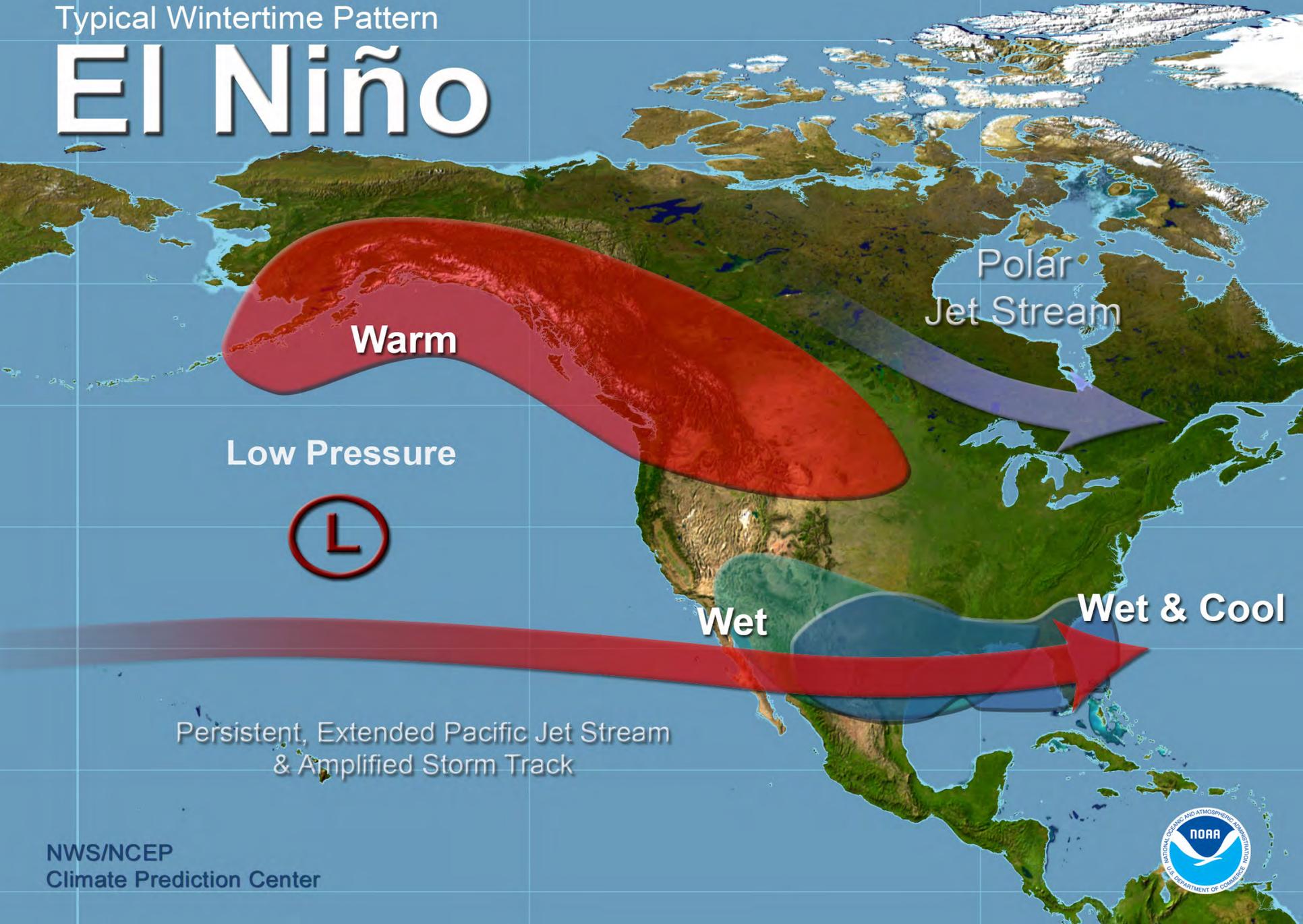
Enhanced upwelling makes surface waters in the eastern Pacific cooler than normal.



www.weather.gov

Typical Wintertime Pattern

# El Niño



# OK Drought 2000-2023

2001-02

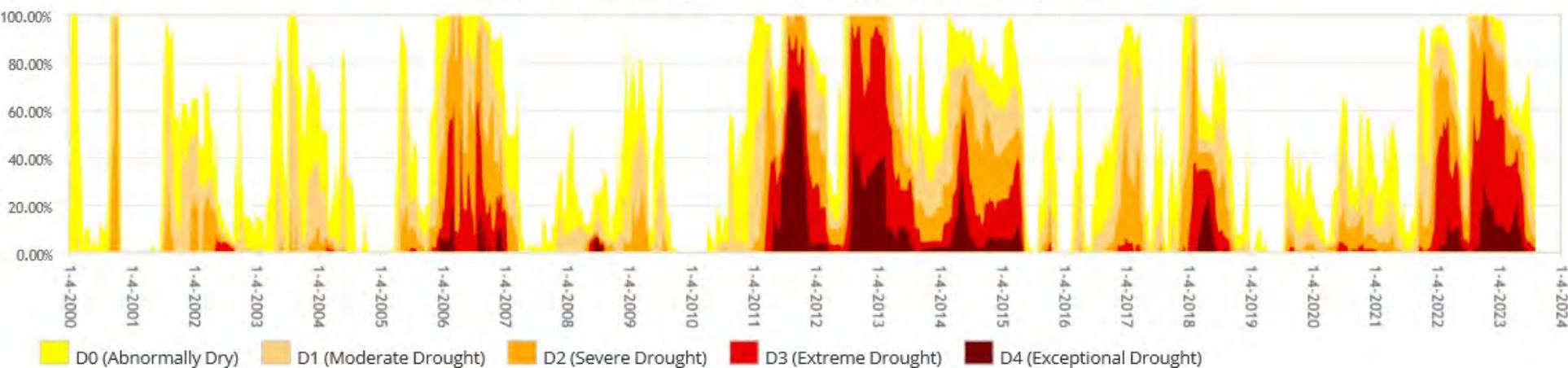
2005-06

2010-15

2017-18

2021-23

Oklahoma Percent Area in U.S. Drought Monitor Categories

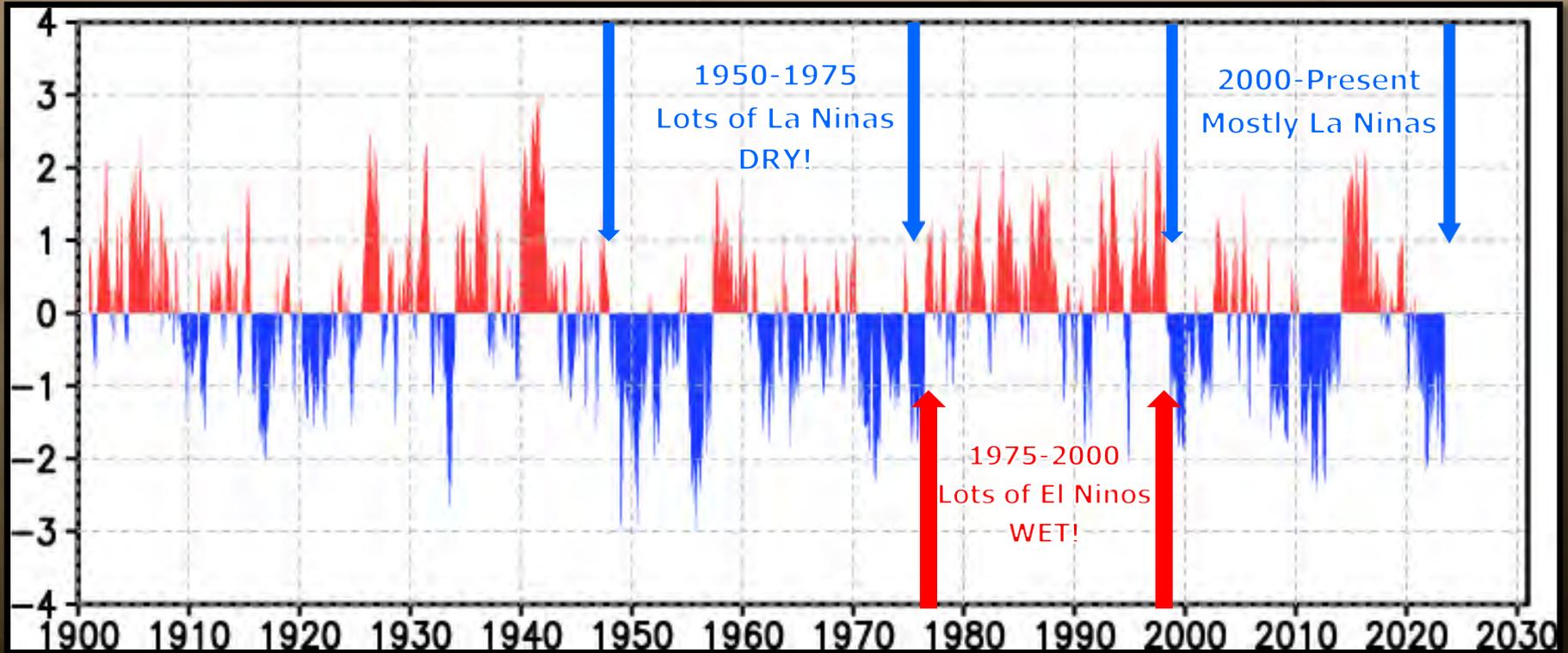


Single-dip Double-dips

Double-dip Triple-dip

La Ninas: can be "drought starters" in Oklahoma

- **Negative PDO values** = more La Nina episodes
- **Positive values (red)** = more El Nino episodes



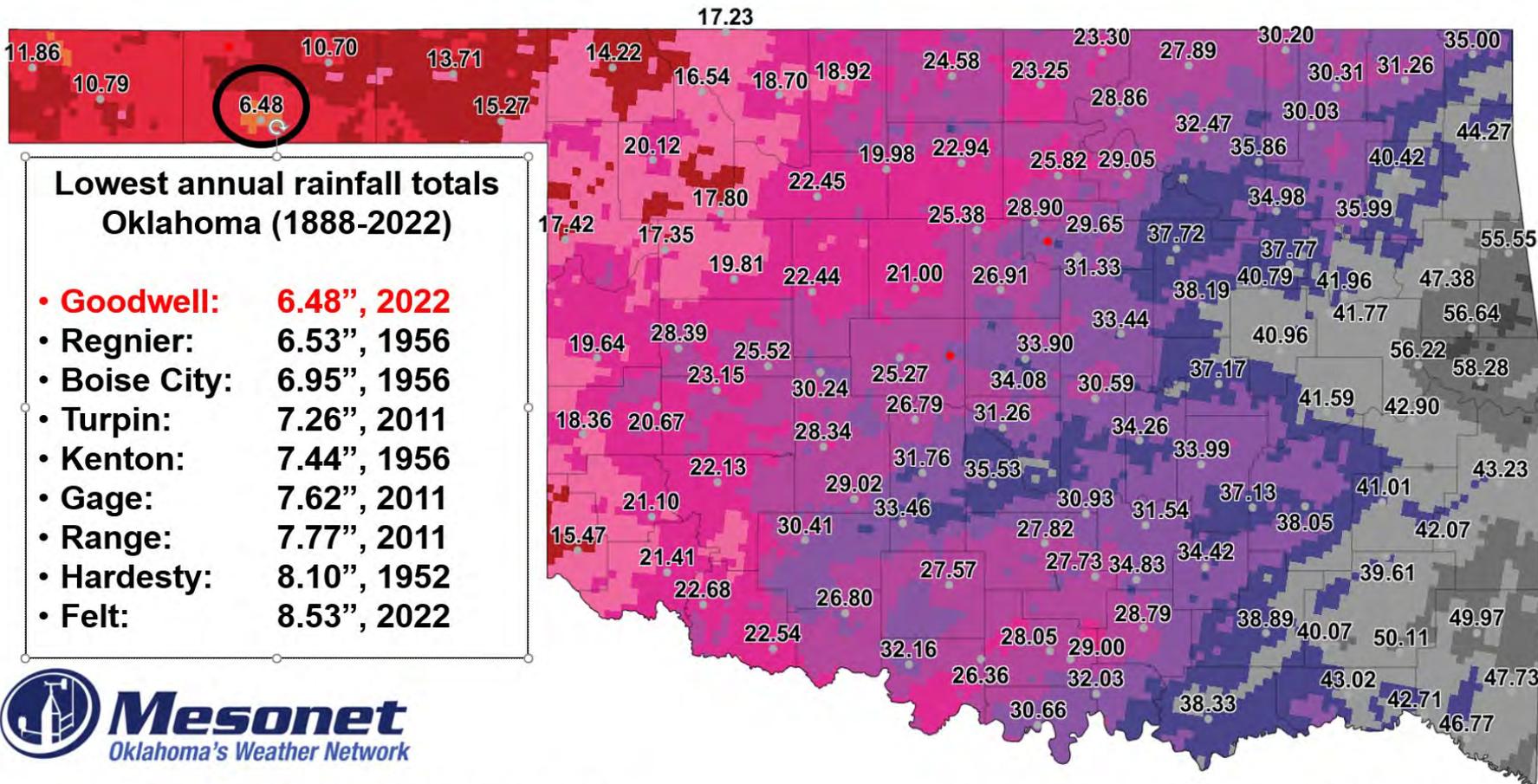
**What's next?**

# Synopsis of our 2021-23 Drought

- **August 2021:** Drought begins, accelerates in December 2021 through early spring 2022
- **Spring 2022:** Relief for eastern two-thirds, west drought remains
- **June 28, 2022:** Only 31% of the state in drought
- **June 11, 2022:** “Flash drought” begins, rapid intensification due to extreme lack of rainfall, above normal temperatures, sun, and wind
- **Mid-October 2022:** Drought peaks (worst since February 2013)
- **Winter-Spring 2023:** I-44 divide...relief to the southeast, intensification to the northwest
- **Summer 2023:** More widespread relief, drought hanging on in far southwest and north central/east

# A Dubious Record

Goodwell, driest year in OK History  
(1880s-present)



365-Day Rainfall Accumulation (inches)

January 1-December 31, 2022

# Current Conditions

## U.S. Drought Monitor Oklahoma

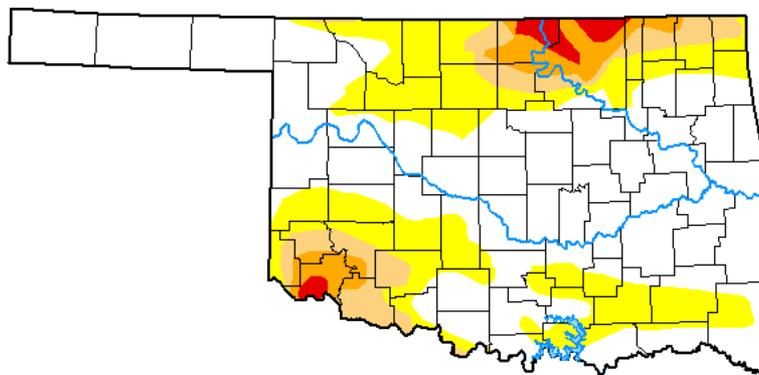
**August 8, 2023**

(Released Thursday, Aug. 10, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	62.25	37.75	12.81	5.84	1.60	0.00
<b>Last Week</b> 08-01-2023	52.33	47.67	17.90	7.58	2.58	0.00
<b>3 Months Ago</b> 05-09-2023	39.19	60.81	52.47	48.07	33.10	10.09
<b>Start of Calendar Year</b> 01-03-2023	1.82	98.18	89.73	80.92	56.13	11.65
<b>Start of Water Year</b> 09-27-2022	0.00	100.00	99.88	94.44	64.44	17.25
<b>One Year Ago</b> 08-09-2022	0.00	100.00	99.33	92.45	48.83	0.67



Intensity:

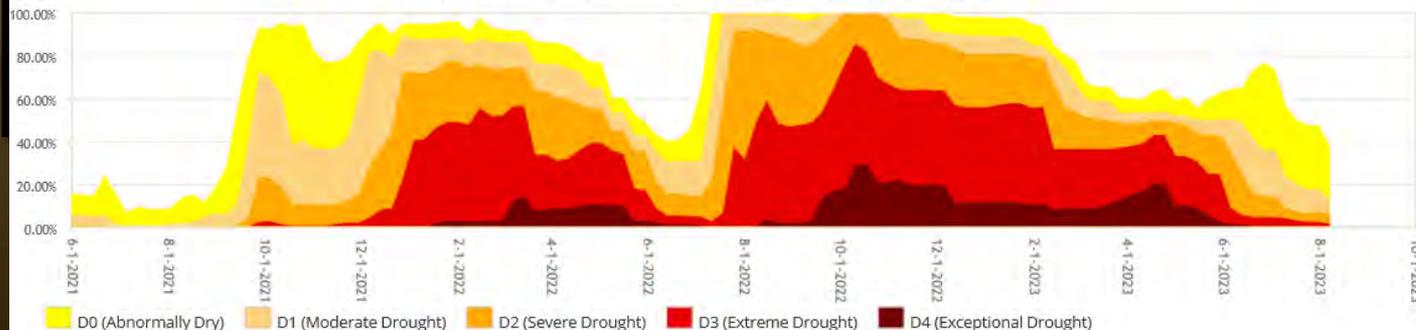
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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:

Brad Pugh  
CPC/NOAA

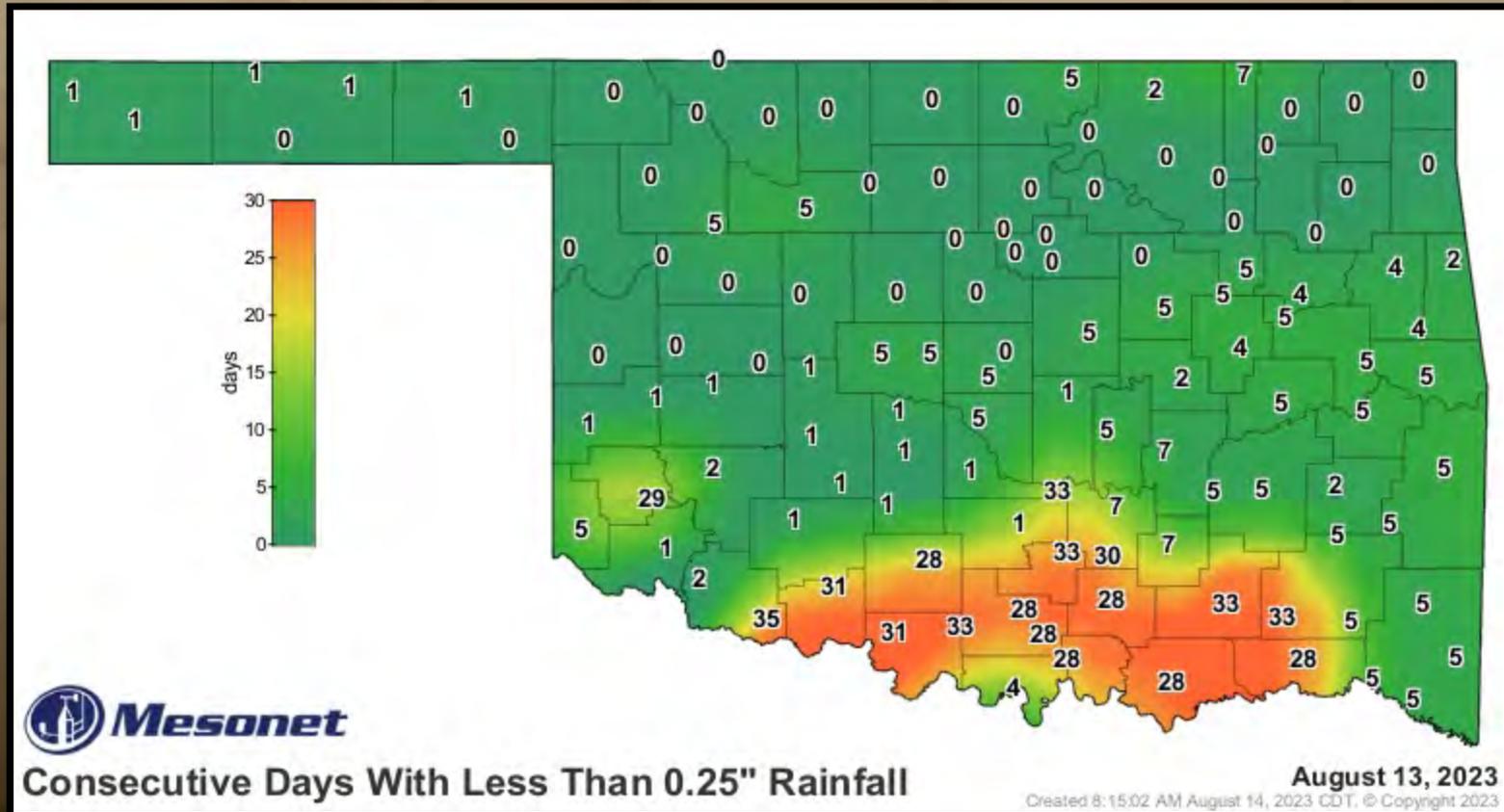
Oklahoma Percent Area in U.S. Drought Monitor Categories



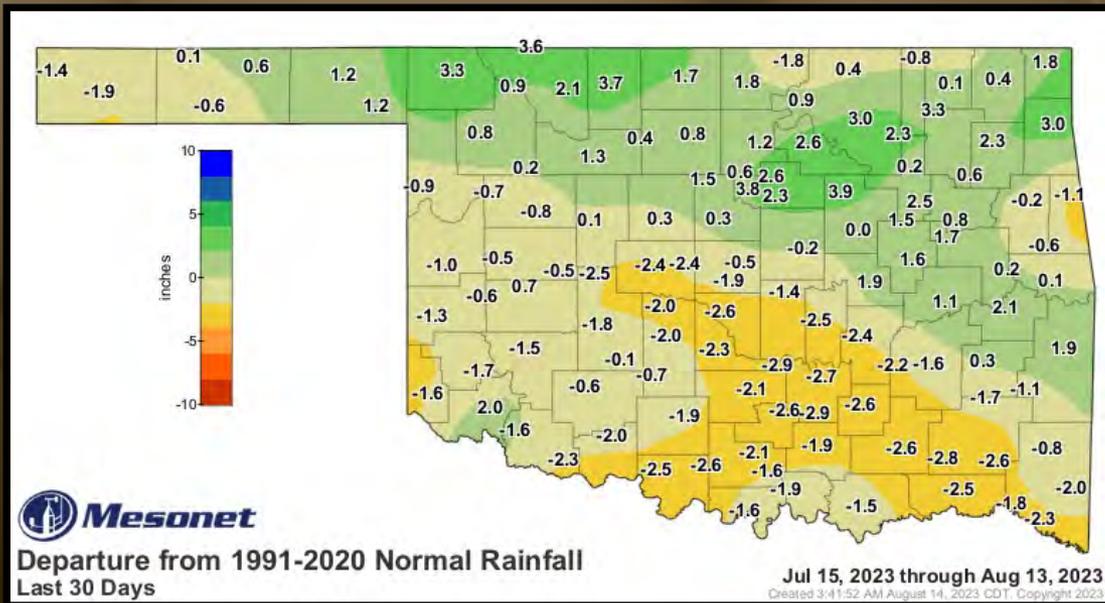
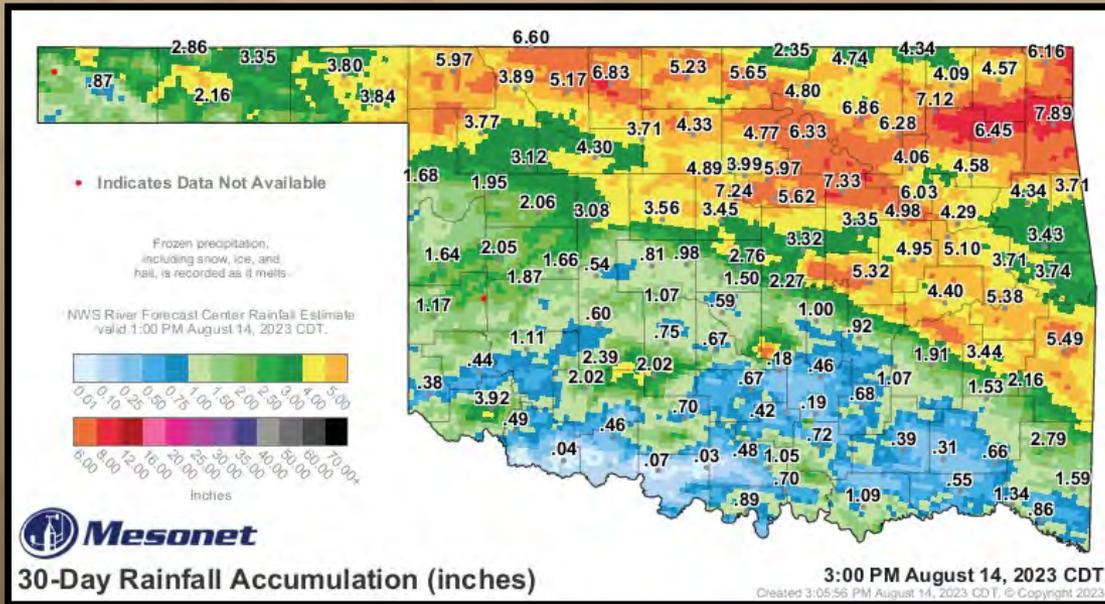


# Southwest Jackson County

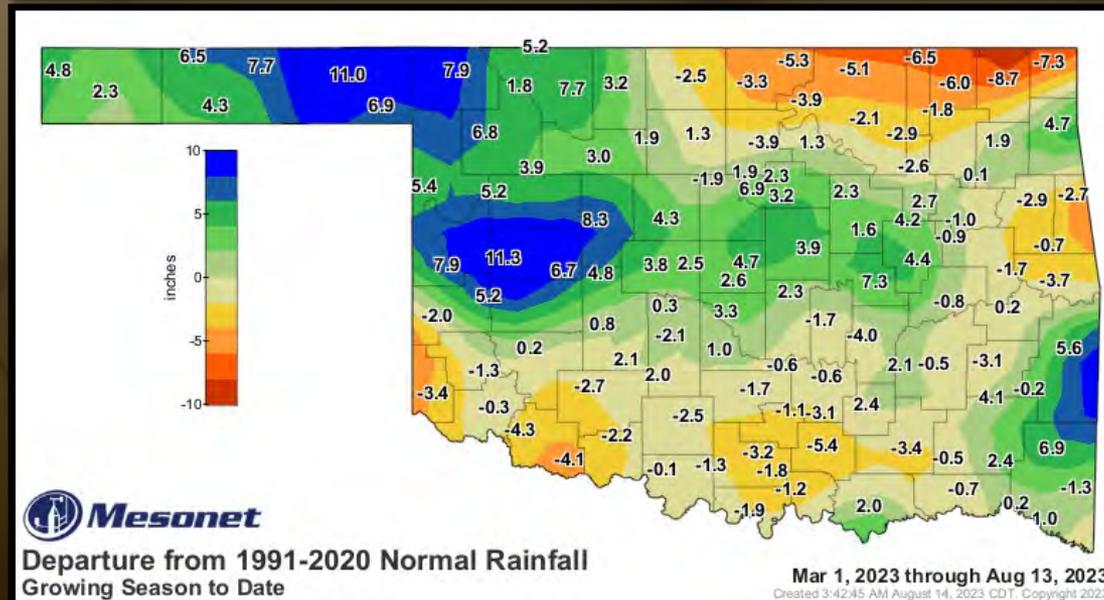
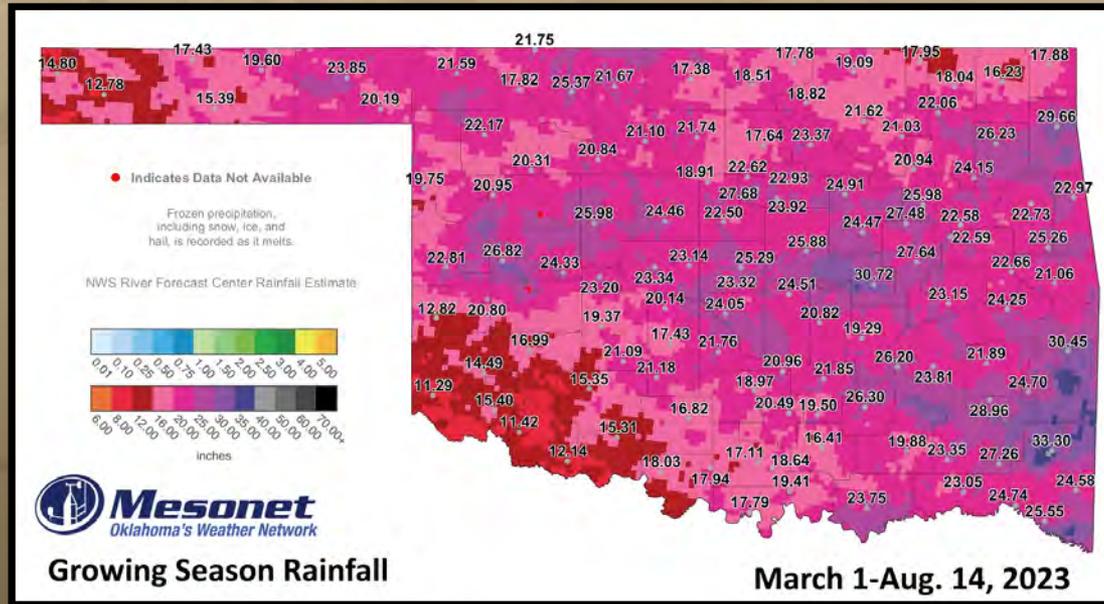
# Southern OK Dry Spell Grows



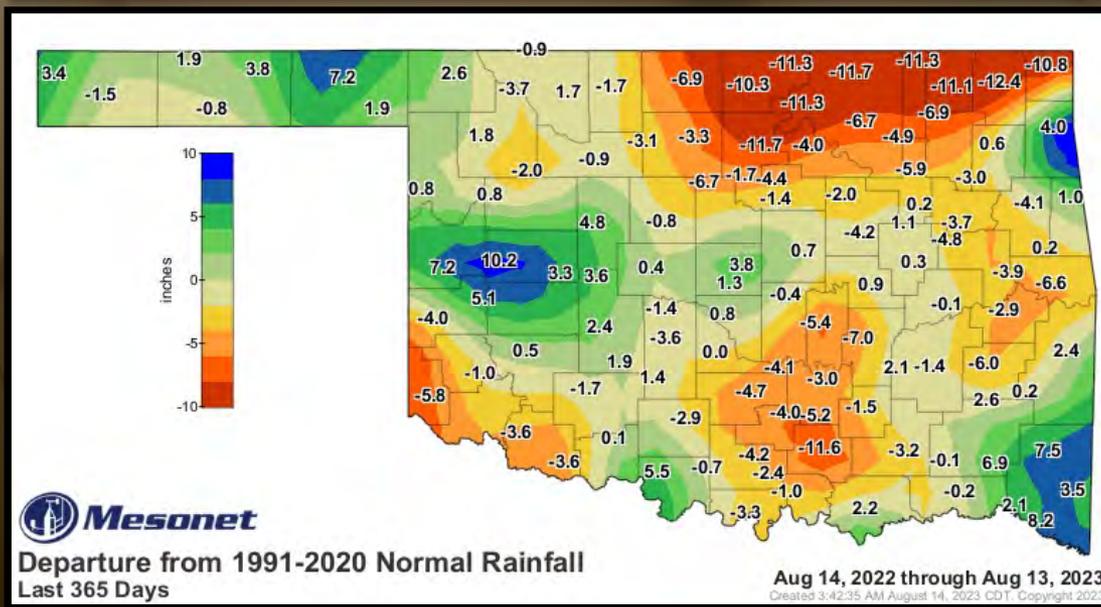
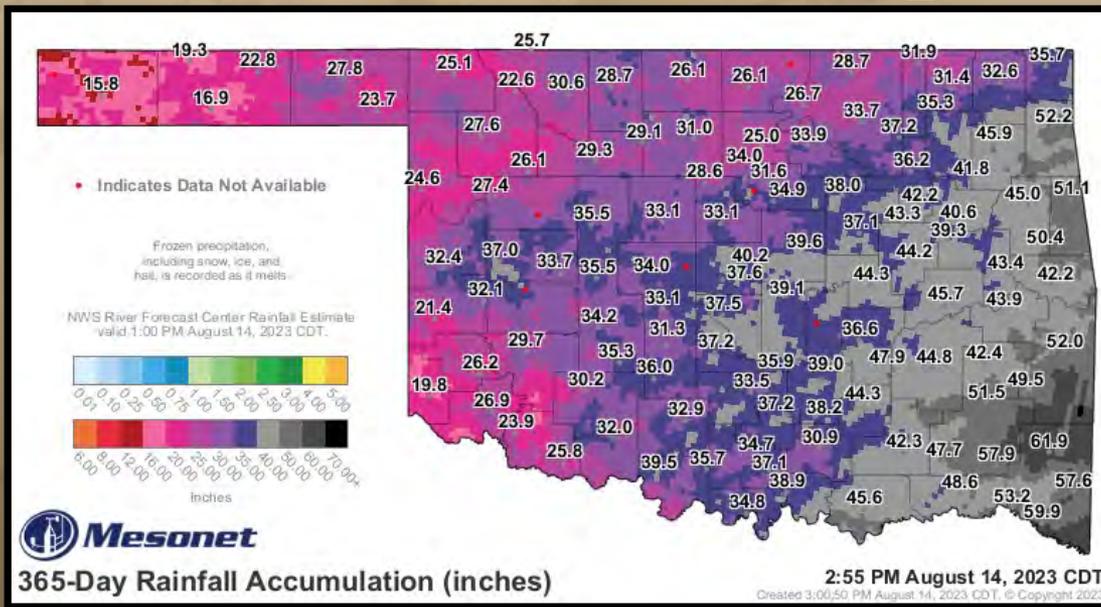
# Last 30 Days



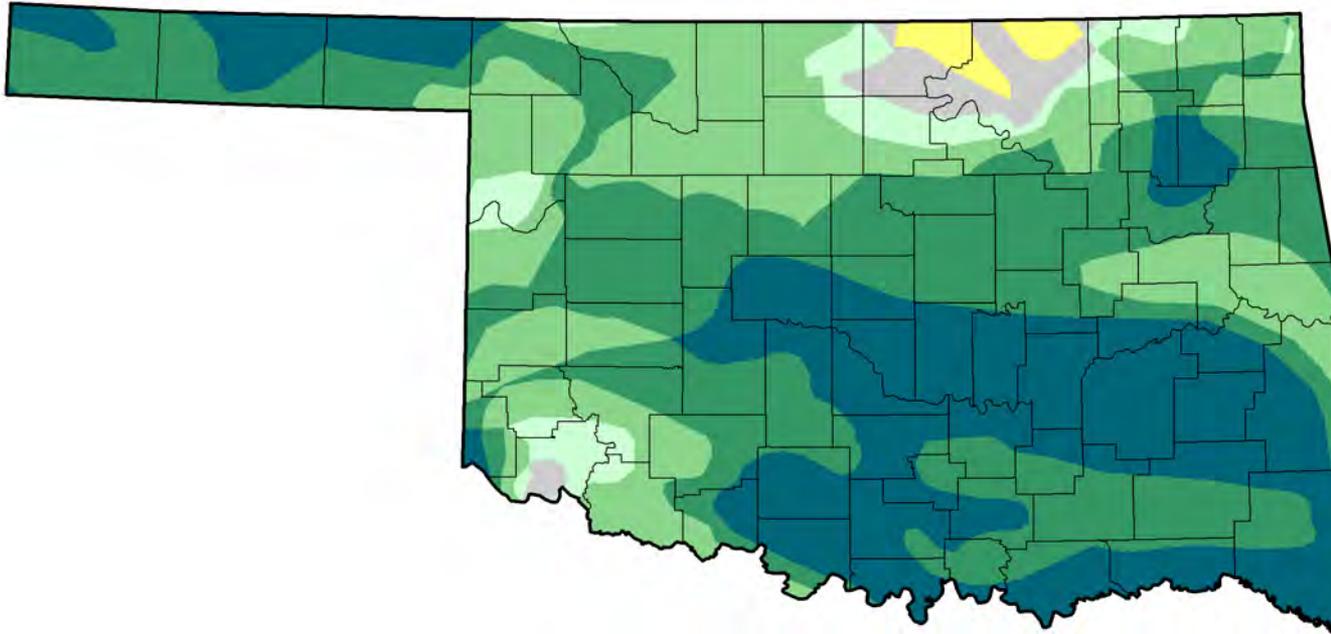
# Growing Season Rainfall



# Last 365 Days



# Change in the Last Year



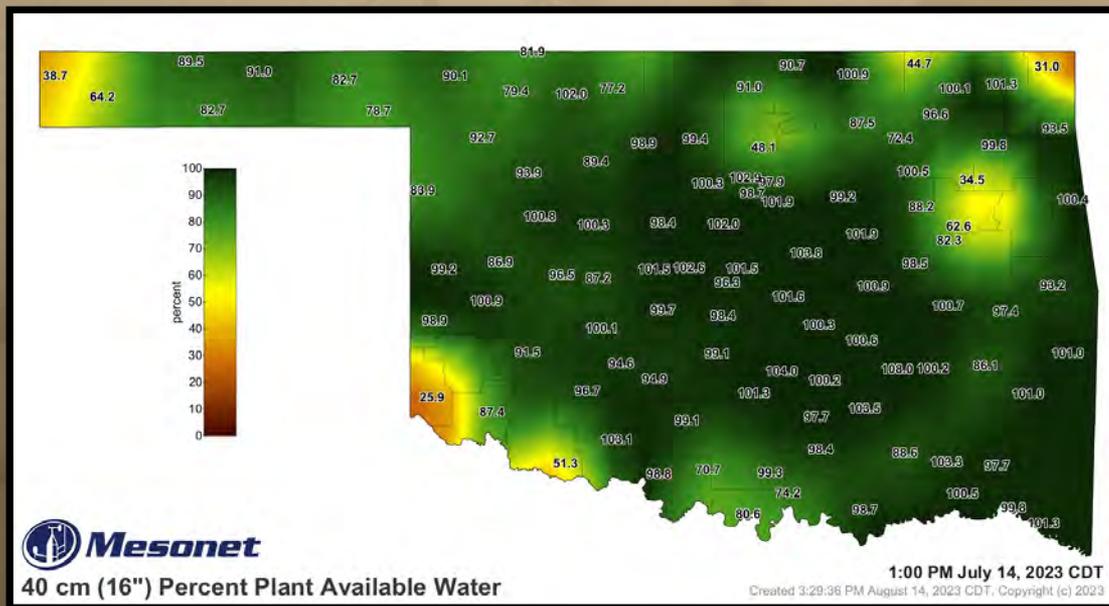
August 8, 2023  
compared to  
August 9, 2022

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

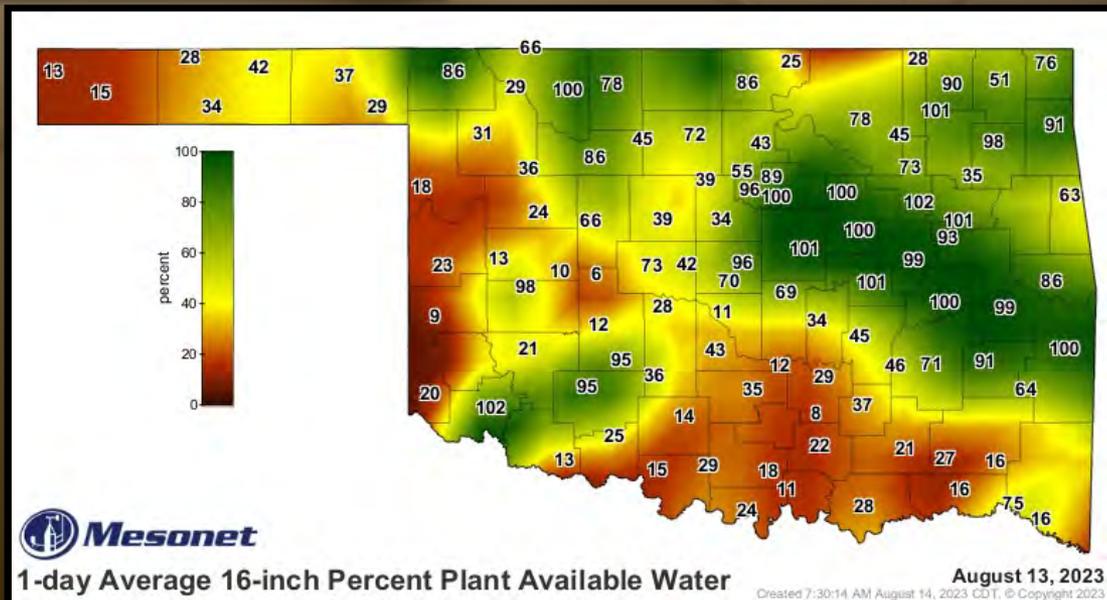
-  5 Class Degradation
-  4 Class Degradation
-  3 Class Degradation
-  2 Class Degradation
-  1 Class Degradation
-  No Change
-  1 Class Improvement
-  2 Class Improvement
-  3 Class Improvement
-  4 Class Improvement
-  5 Class Improvement

# Are Problems Lurking?

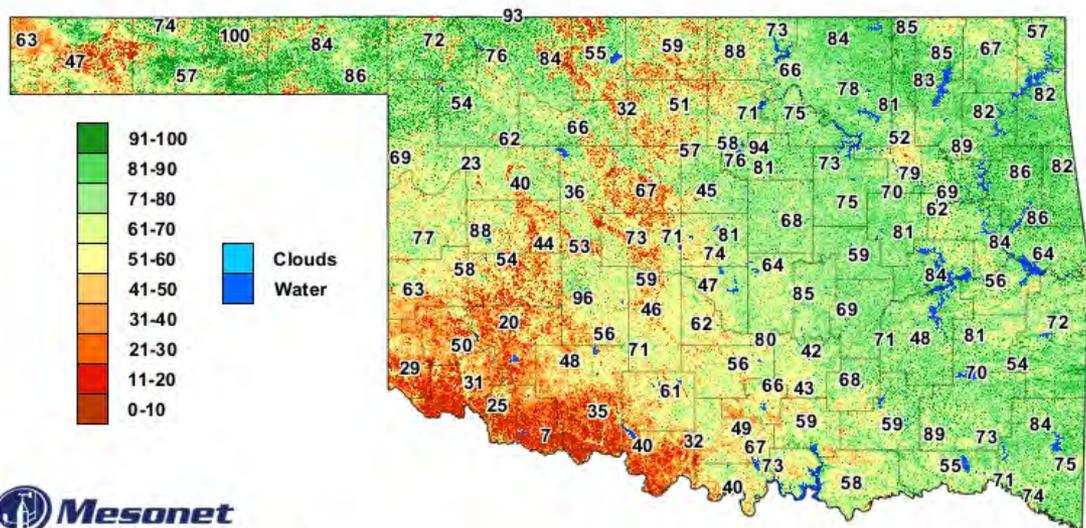
A month ago



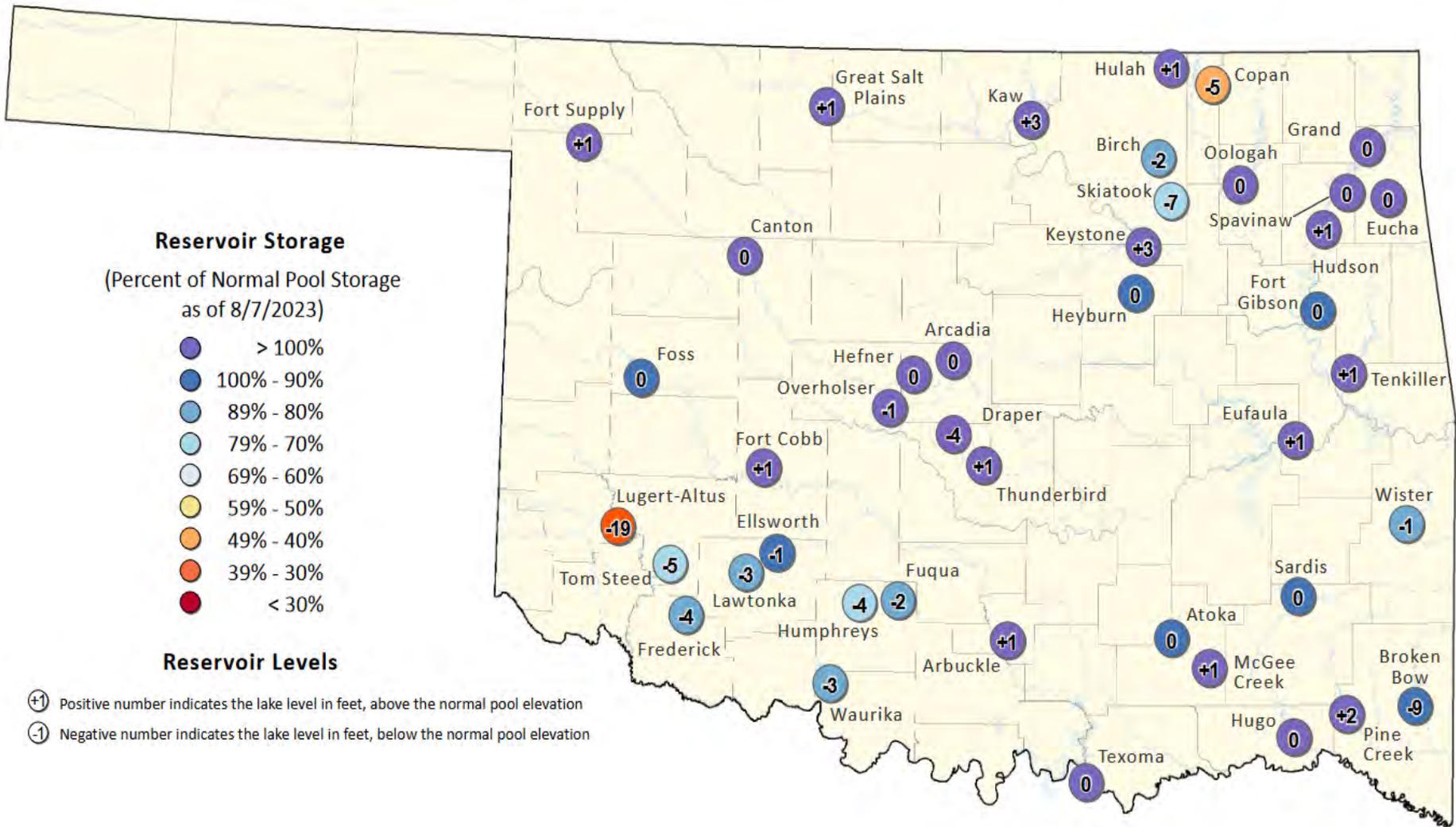
Drying out!



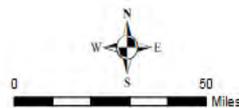
# Burn bans



# Oklahoma Reservoir Levels and Storage as of 8/7/2023

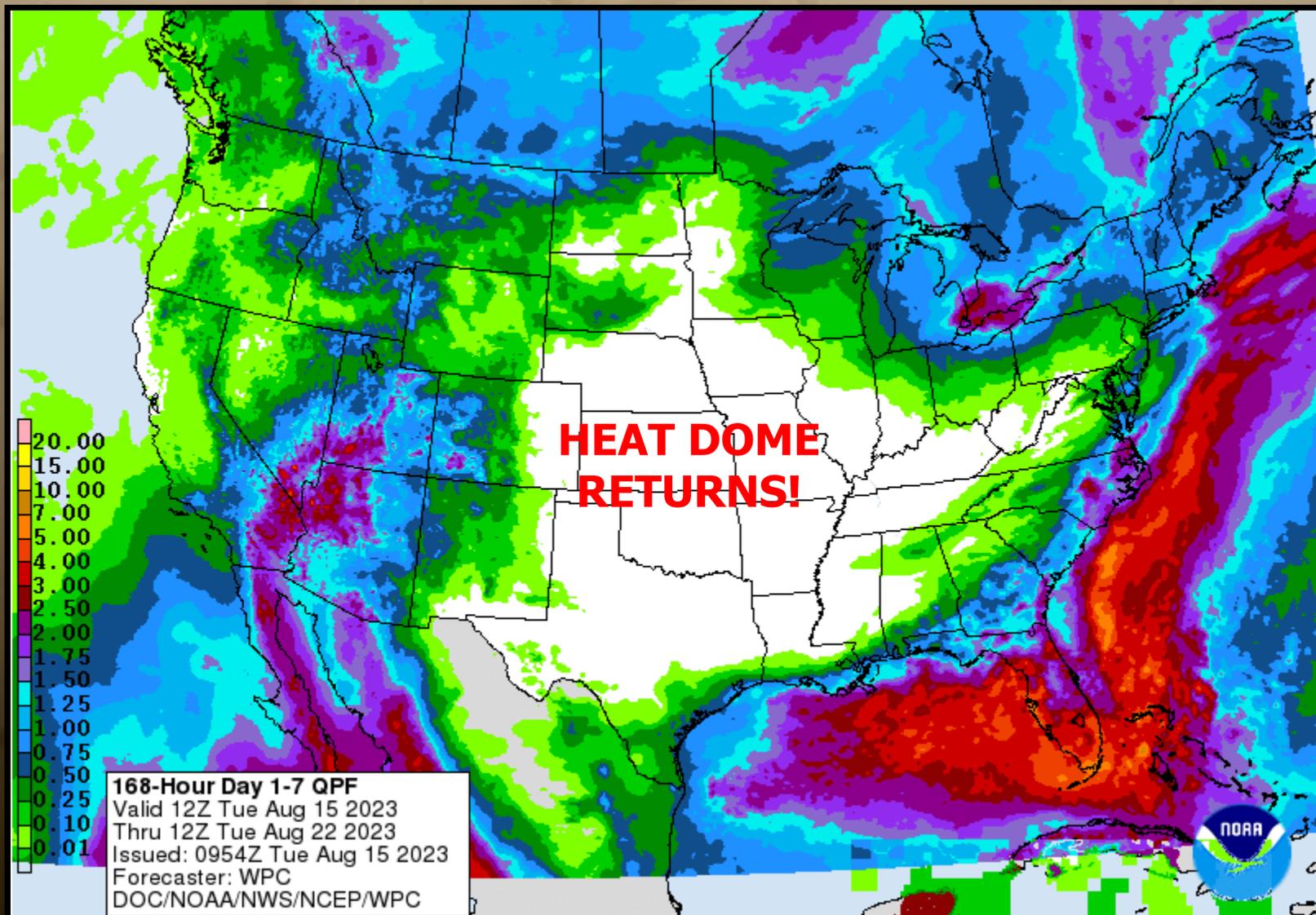


This map shows reservoir storage as a percentage of normal pool storage capacity. The source information was collected from real-time lake gages monitored by the U.S. Army Corps of Engineers ([https://www.swt-wc.usace.army.mil/Daily\\_Morning\\_Reservoir\\_Report.pdf](https://www.swt-wc.usace.army.mil/Daily_Morning_Reservoir_Report.pdf)), and the U.S. Geological Survey ([https://waterdata.usgs.gov/ok/nwis/current/?type=lake&group\\_key=basin\\_cd](https://waterdata.usgs.gov/ok/nwis/current/?type=lake&group_key=basin_cd)). For more information please visit the OWRB's website: (<https://www.owrb.ok.gov>).



# Forecasts and Outlooks

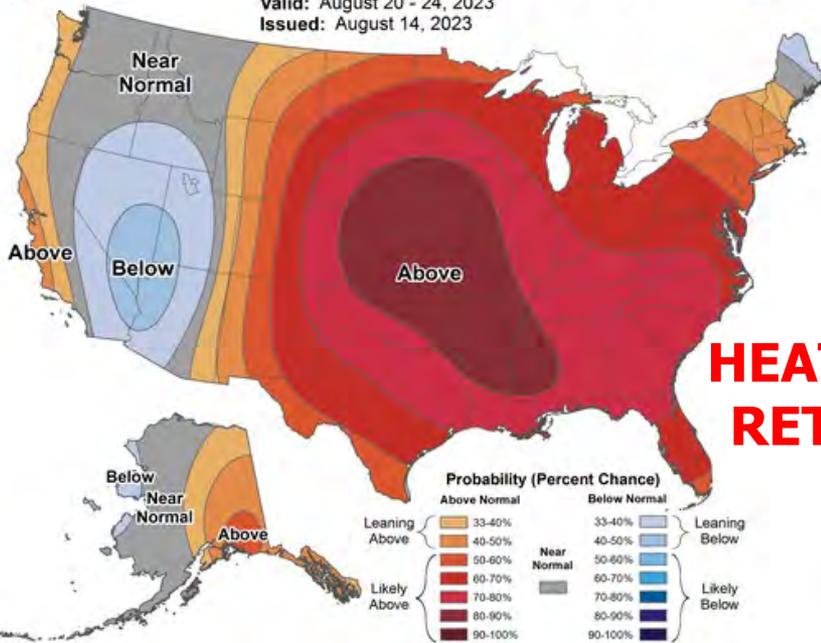
# Next 7 Days



# Next Week HOT AND DRY!

## 6-10 Day Temperature Outlook

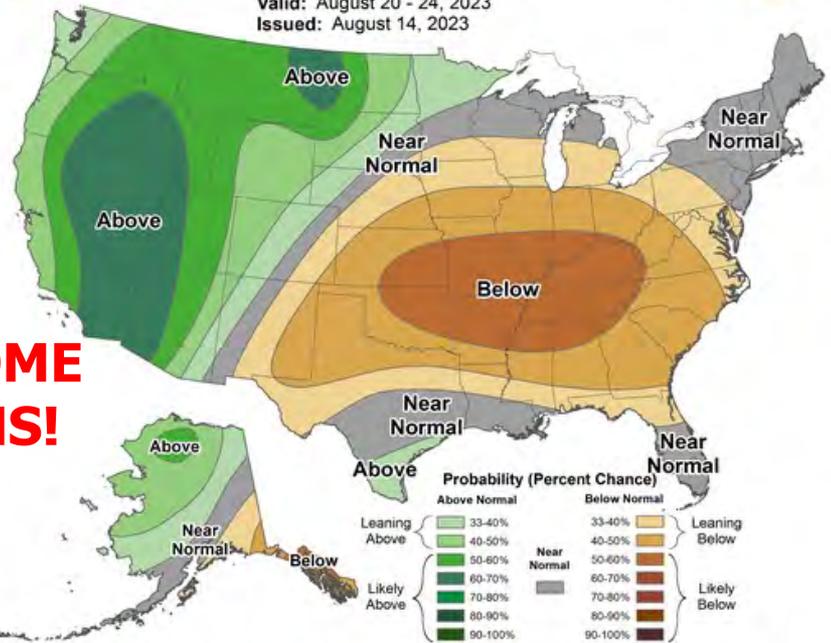
Valid: August 20 - 24, 2023  
Issued: August 14, 2023



**HEAT DOME  
RETURNS!**

## 6-10 Day Precipitation Outlook

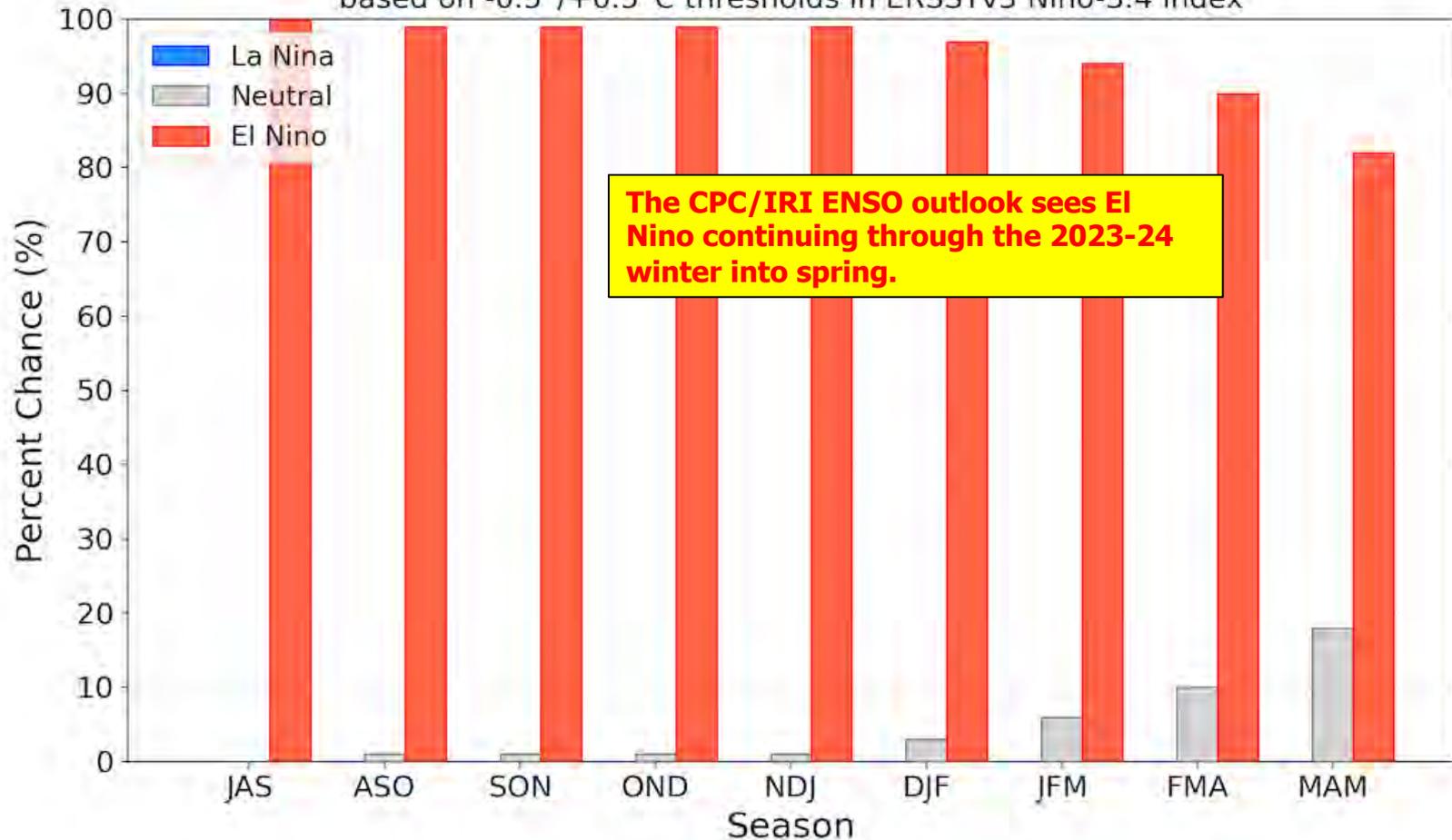
Valid: August 20 - 24, 2023  
Issued: August 14, 2023



# Cool Season Help?

## Official NOAA CPC ENSO Probabilities (issued Aug. 2023)

based on  $-0.5^{\circ}/+0.5^{\circ}\text{C}$  thresholds in ERSSTv5 Niño-3.4 index



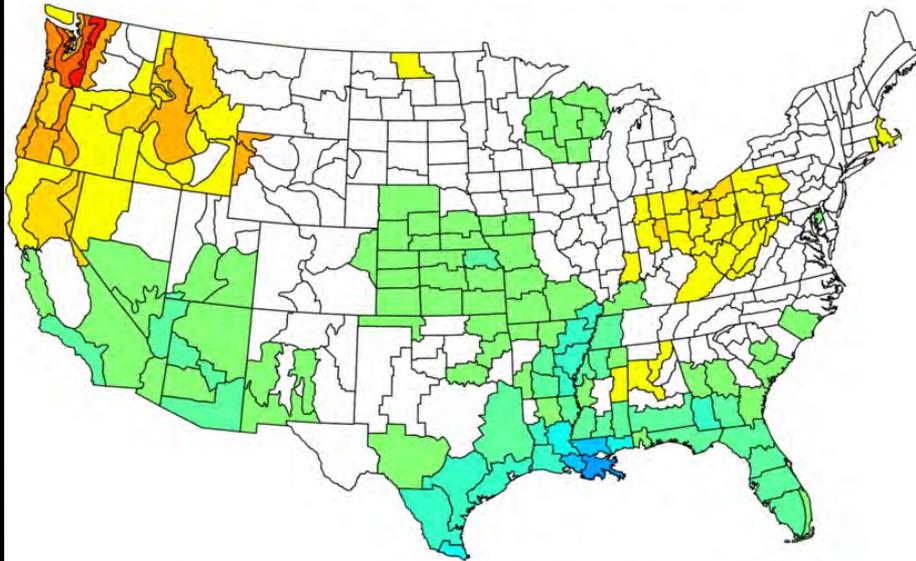
# Strength Is Important

Target	< -1.5°C	< -1.0°C	< -0.5°C	> 0.5°C	> 1.0°C	> 1.5°C
<b>JAS</b>	~0	~0	~0	~100	83	20
<b>ASO</b>	~0	~0	~0	99	86	44
<b>SON</b>	~0	~0	~0	99	90	58
<b>OND</b>	~0	~0	~0	99	92	66
<b>NDJ</b>	~0	~0	~0	99	90	66
<b>DJF</b>	~0	~0	~0	97	84	56
<b>JFM</b>	~0	~0	~0	94	75	40
<b>FMA</b>	~0	~0	~0	90	61	23
<b>MAM</b>	~0	~0	~0	82	42	9
	< -1.5°C	< -1.0°C	< -0.5°C	> 0.5°C	> 1.0°C	> 1.5°C

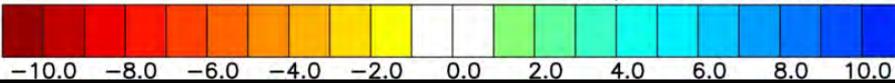
66% Chance: Strong El Nino

# El Nino November-March Precipitation Anomalies Strong-to-Very Strong

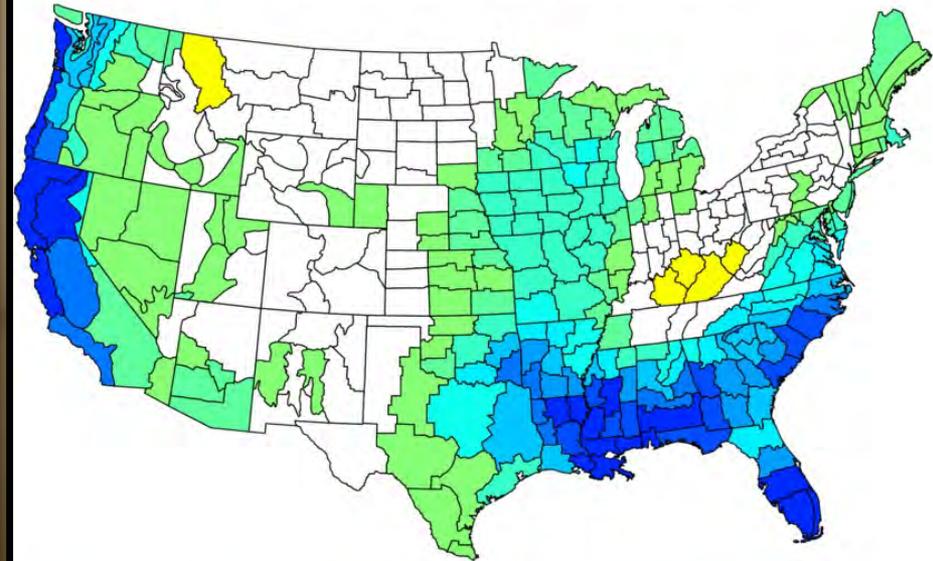
NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)  
Nov to Mar 1957-58,1965-66,1972-73,1987-88,1991-92  
Versus 1981-2010 Longterm Average



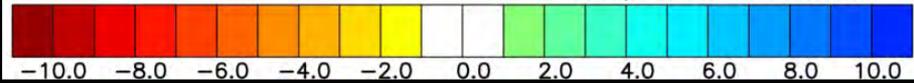
NOAA/ESRL PSD and CIRES-CU



NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)  
Nov to Mar 1982-83,1997-98,2015-16  
Versus 1981-2010 Longterm Average



NOAA/ESRL PSD and CIRES-CU



# September Temperature



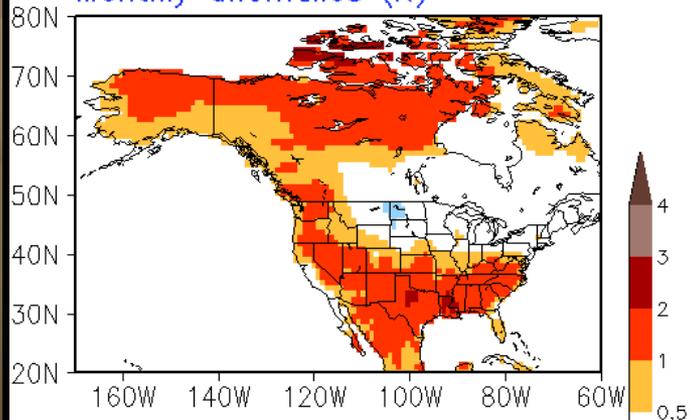
NWS/NCEP/CPC

Last update: Tue Aug 15 2023

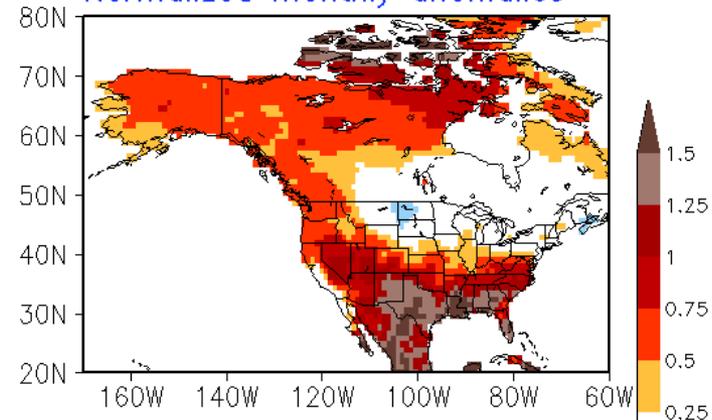
Initial conditions: 06Z12Aug2023-00Z15Aug2023

## CFSv2 monthly T2m forecast for Sep2023

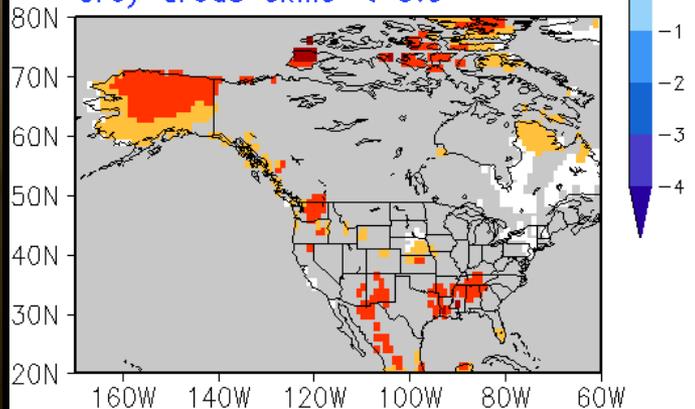
Monthly anomalies (K)



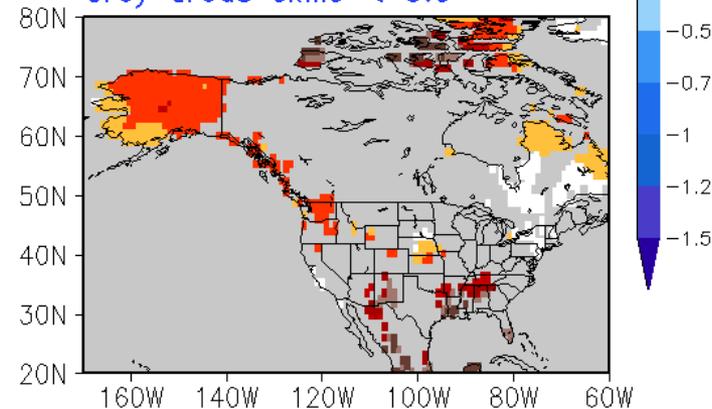
Normalized monthly anomalies



Grey areas skills < 0.3



Grey areas skills < 0.3



# September Rainfall



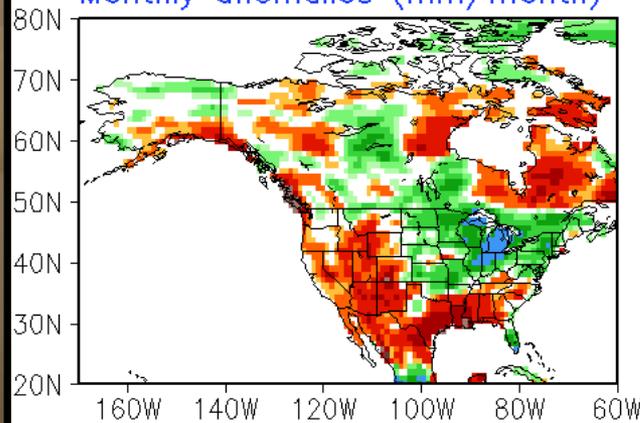
NWS/NCEP/CPC

Last update: Tue Aug 15 2023

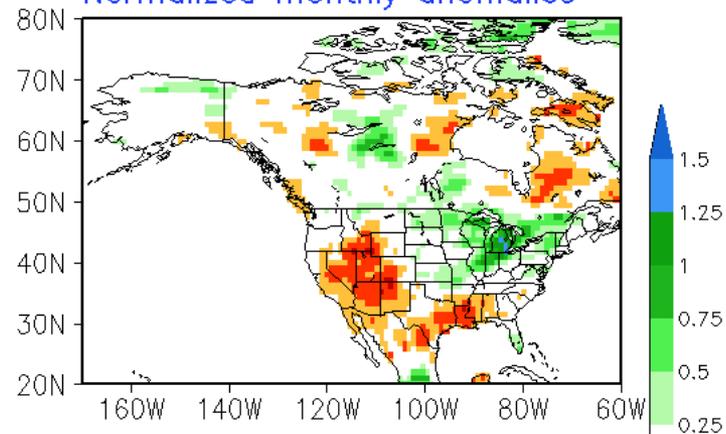
Initial conditions: 06Z12Aug2023-00Z15Aug2023

## CFSv2 monthly Prec forecast for Sep2023

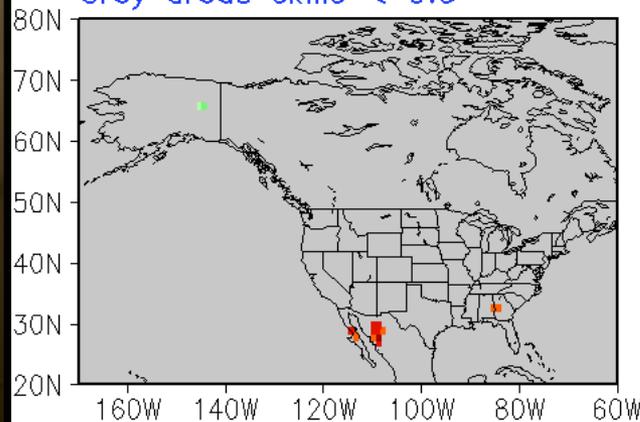
Monthly anomalies (mm/month)



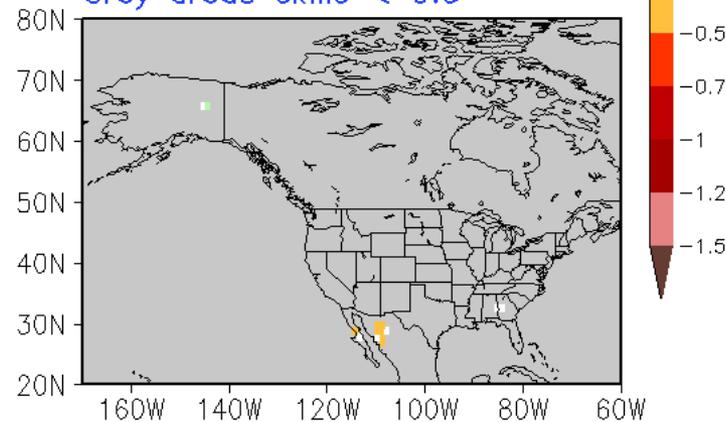
Normalized monthly anomalies



Grey areas skills < 0.3



Grey areas skills < 0.3



**Thank You!**