



# DROUGHT CONDITIONS

## IN CENTRAL OKLAHOMA

John Harrington

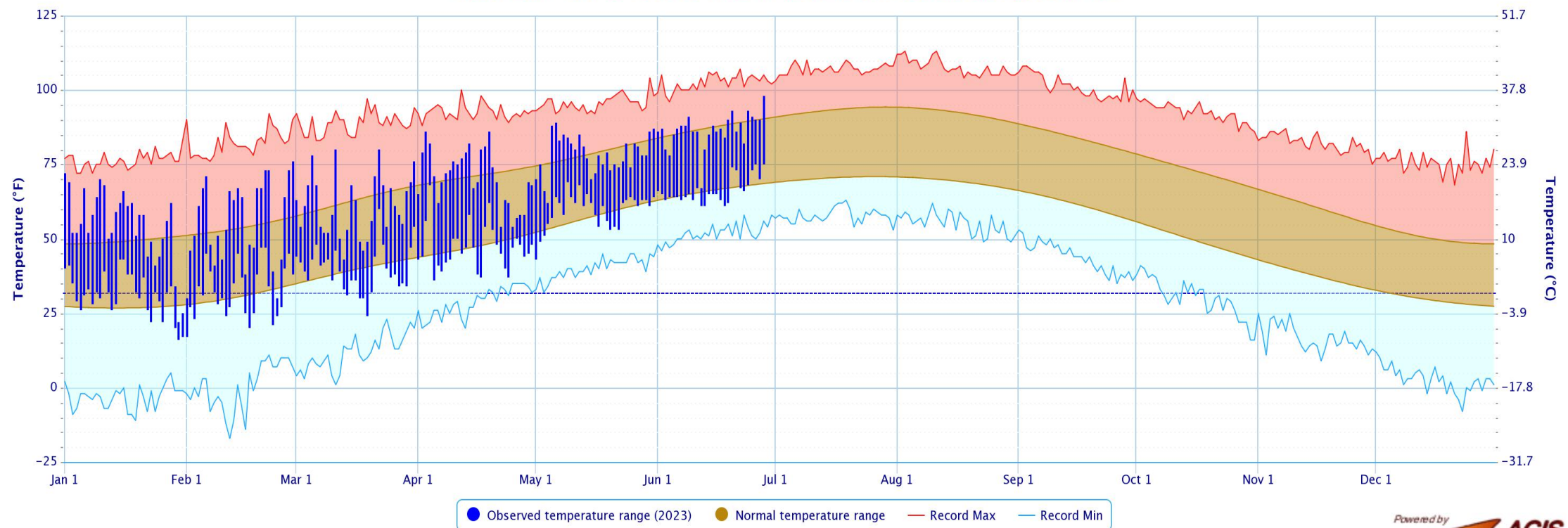
Water Resources Director

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July 1, 2023

# TEMPERATURE PLOT FOR OKLAHOMA CITY, OKLAHOMA FOR 2023



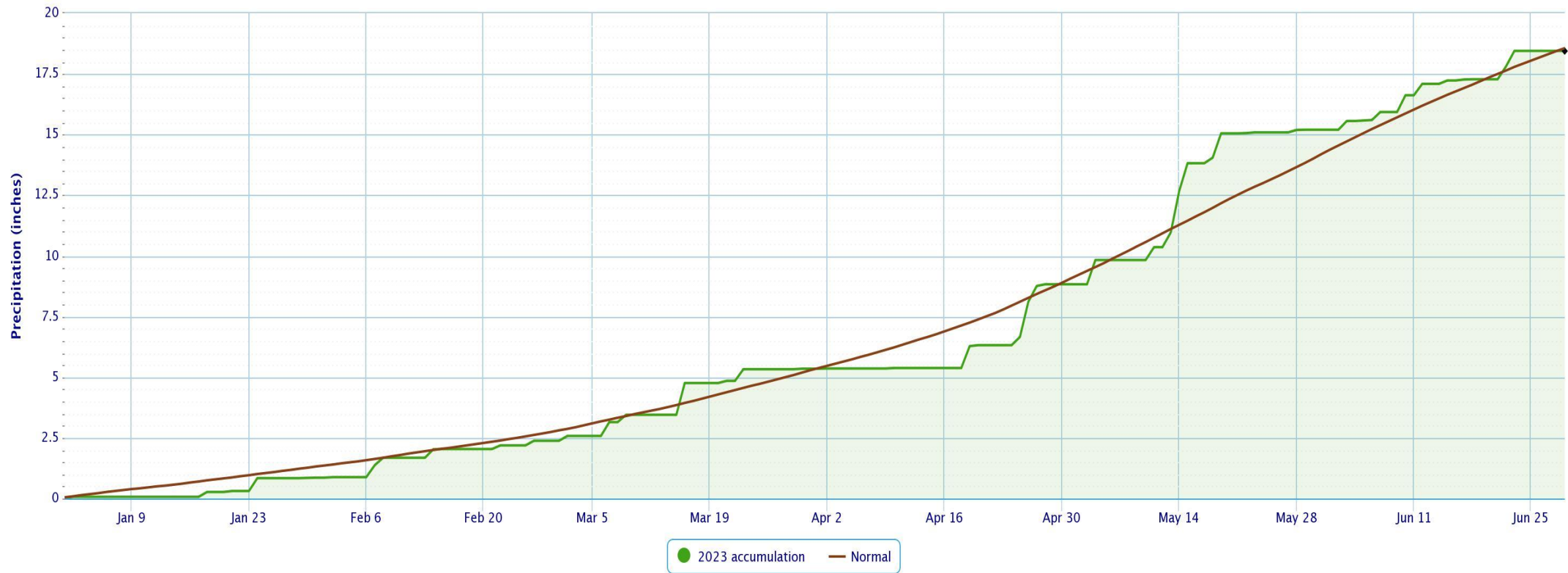
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# PRECIPITATION PLOT FOR OKLAHOMA CITY, OKLAHOMA FOR 2023



Accumulated Precipitation – Oklahoma City Area, OK (ThreadEx)



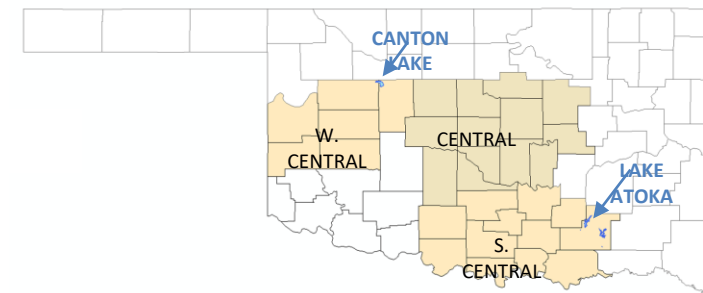
# RAINFALL SUMMARIES BY OKLAHOMA CLIMATE DIVISION



Calendar Year 01-Jan-2022 through			28-Jun-2023			
Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	14.81"	+0.08"	101%	40th wettest	4.37" (2011)	25.52" (1957)
Central	17.50"	-1.98"	90%	50th driest	8.17" (1936)	34.13" (1957)
S. Central	19.89"	-1.54"	93%	48th driest	9.88" (1963)	41.95" (2015)
Statewide	17.60"	-1.17"	94%	50th wettest	8.76" (1936)	32.46" (1957)

Water Year: 01-Oct-2021 through			28-Jun-2023			
Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	19.94"	-0.33"	98%	39th wettest	8.91" (2010-11)	33.92" (2018-19)
Central	24.45"	-3.14"	89%	49th driest	14.14" (1995-96)	43.44" (1984-85)
S. Central	29.67"	-1.45"	95%	38th wettest	13.18" (1924-25)	50.77" (2014-15)
Statewide	25.05"	-1.80"	93%	50th wettest	14.31" (1955-56)	38.40" (1956-57)

Summer Jun 01 through			28-Jun-2023			
Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	7.14"	+3.22"	182%	7th wettest	0.11" (1933)	8.75" (1962)
Central	4.24"	-0.43"	91%	44th wettest	0.34" (1933)	11.07" (2007)
S. Central	4.74"	+0.18"	104%	31st wettest	0.16" (2011)	9.23" (2015)
Statewide	4.47"	+0.19"	104%	36th wettest	0.41" (1933)	8.46" (2007)



The climate divisions shown include statewide totals, central Oklahoma totals, and totals for the two divisions which have Canton Lake and Lake Atoka—major water sources for central Oklahoma.

# NOAA ONE-MONTH TEMPERATURE OUTLOOK



White areas are shown as EC (Equal Chance) on these maps represent areas where there are no strong climate signals from the climate tools to have skill in preferring one category over another.

That doesn't mean that there are equal chances of each of the categories occurring – it means that currently there is no skill in identifying the most likely category. In these areas, it is best to be prepared for all possibilities.

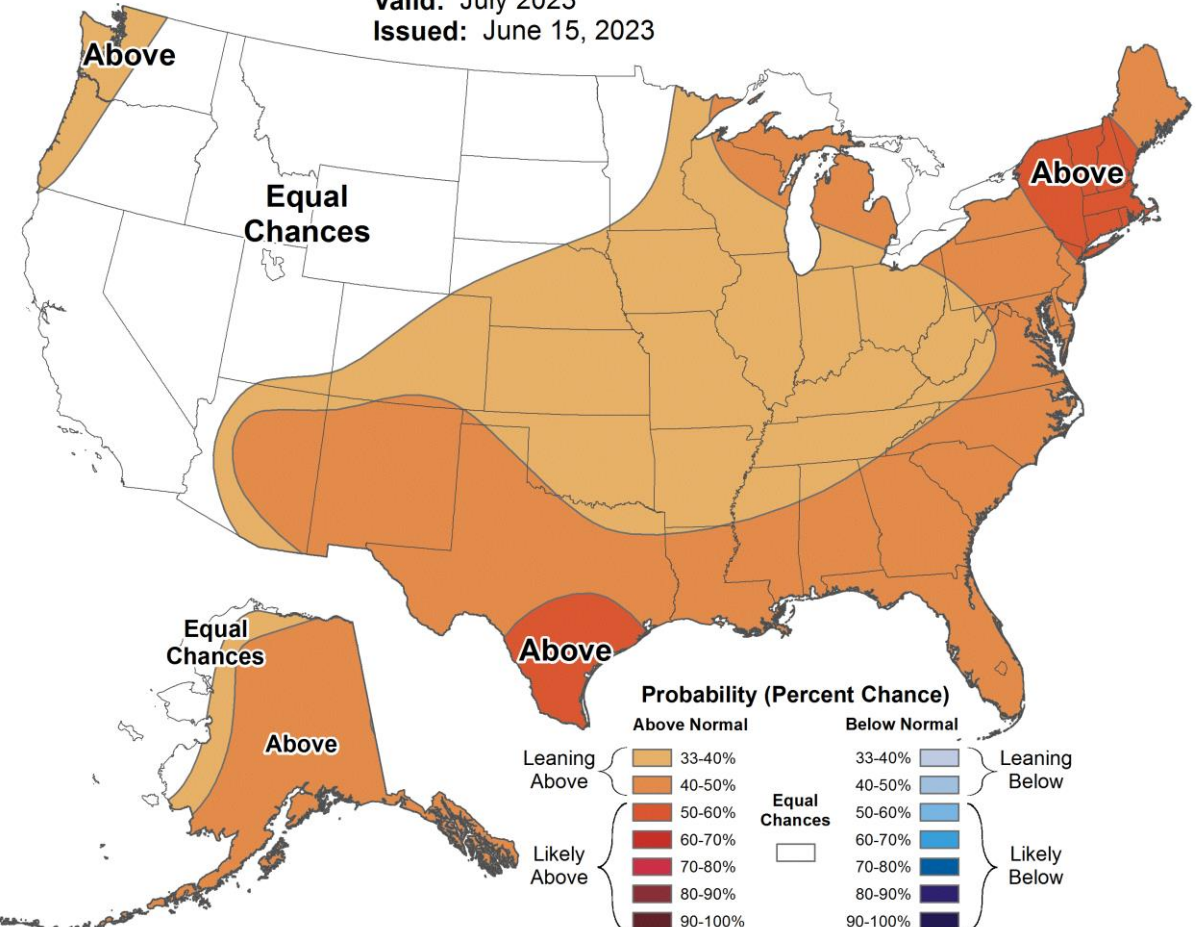
[Climate Prediction Center - Updated OFFICIAL 30-Day Forecasts \(noaa.gov\)](https://www.noaa.gov/climate-prediction-center-30-day-forecasts)



## Monthly Temperature Outlook



Valid: July 2023  
Issued: June 15, 2023



# NOAA ONE-MONTH PRECIPITATION OUTLOOK



White areas are shown as EC (Equal Chance) on these maps represent areas where there are no strong climate signals from the climate tools to have skill in preferring one category over another.

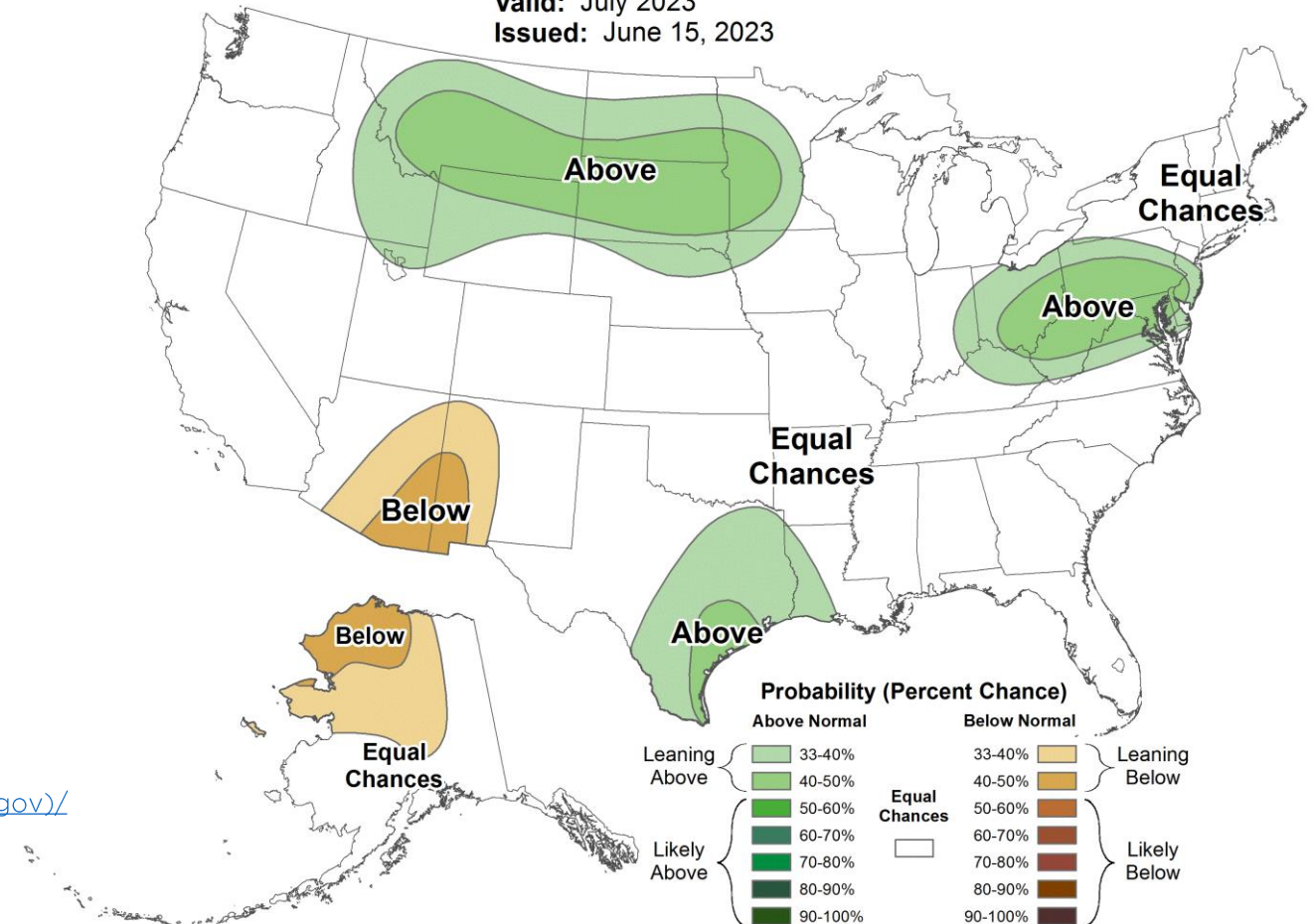
That doesn't mean that there are equal chances of each of the categories occurring – it means that currently there is no skill in identifying the most likely category. In these areas, it is best to be prepared for all possibilities.

[Climate Prediction Center - Updated OFFICIAL 30-Day Forecasts \(noaa.gov\)/](https://www.noaa.gov/climate-prediction-center/updated-official-30-day-forecasts)

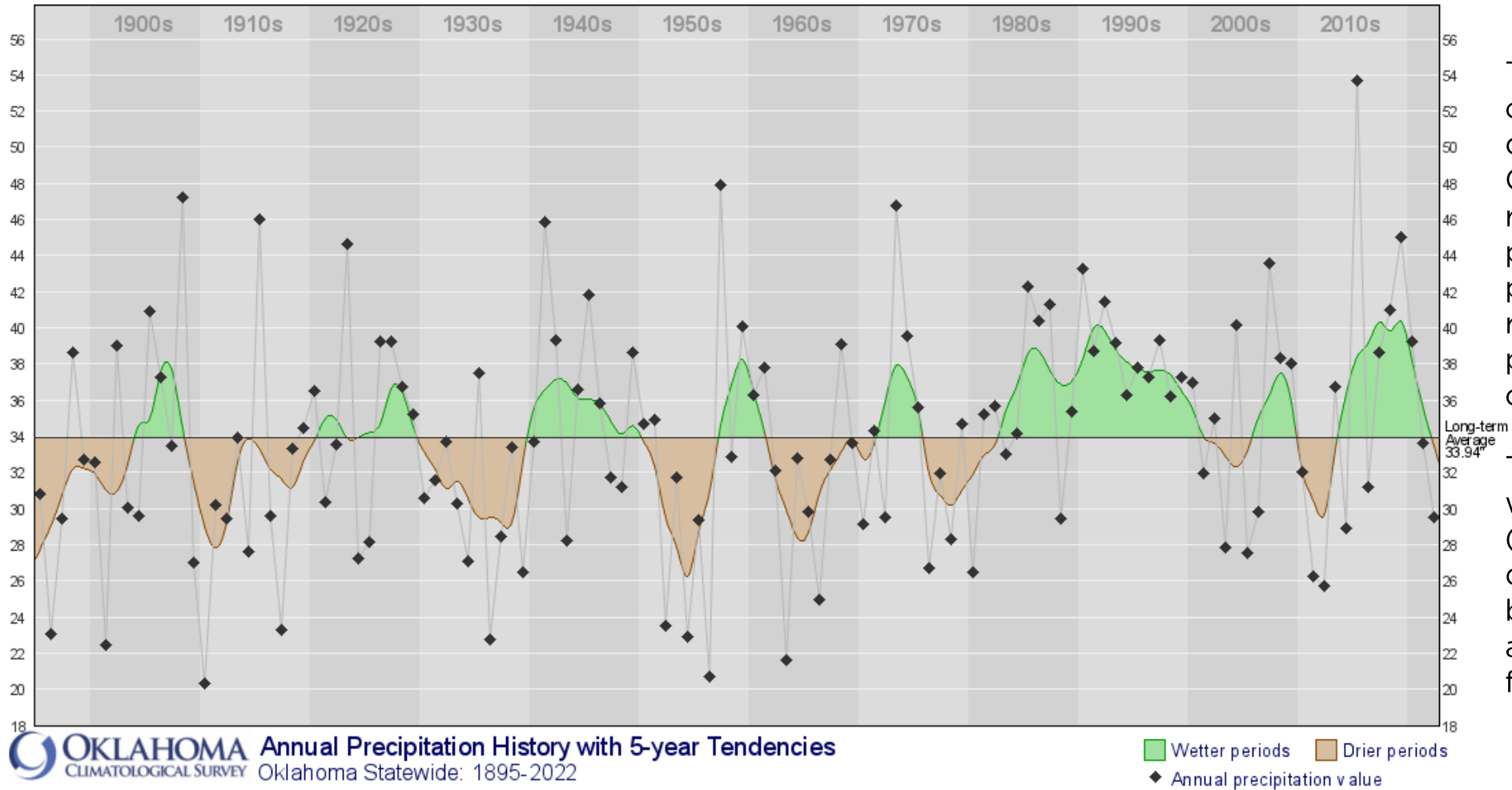


## Monthly Precipitation Outlook

Valid: July 2023  
Issued: June 15, 2023



# Annual Precipitation History with 5-Year Tendencies

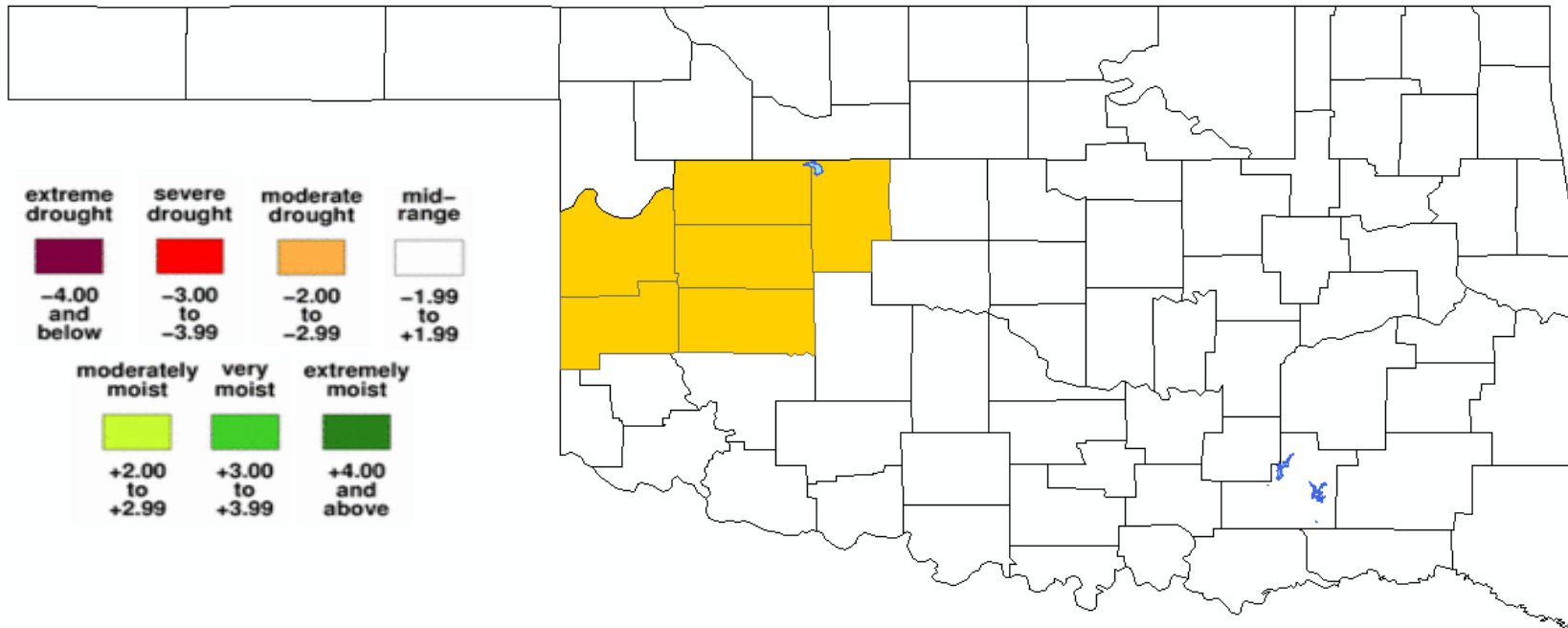


This graph shows the cyclical nature of wet and drought periods in Oklahoma. The black dots represent the annual precipitation for that particular year. The line represents the annual precipitation data smoothed over five years.

This smoothed line shows well the wet periods (shaded green) and the drought periods (shaded brown). The drought cycles appear to average about five to eight years in length.



# DROUGHT SEVERITY INDEX BY CLIMATE DIVISION



**PALMER VALUE**

24 Jun 2023

The Palmer Drought Index (PDI) maps show long-term (cumulative) meteorological drought and wet conditions.

The maps show how the geographical pattern of the long-term moisture conditions has changed over the last 12 months.

On these maps, the red shading denotes drought conditions while the green shading indicates wet conditions.



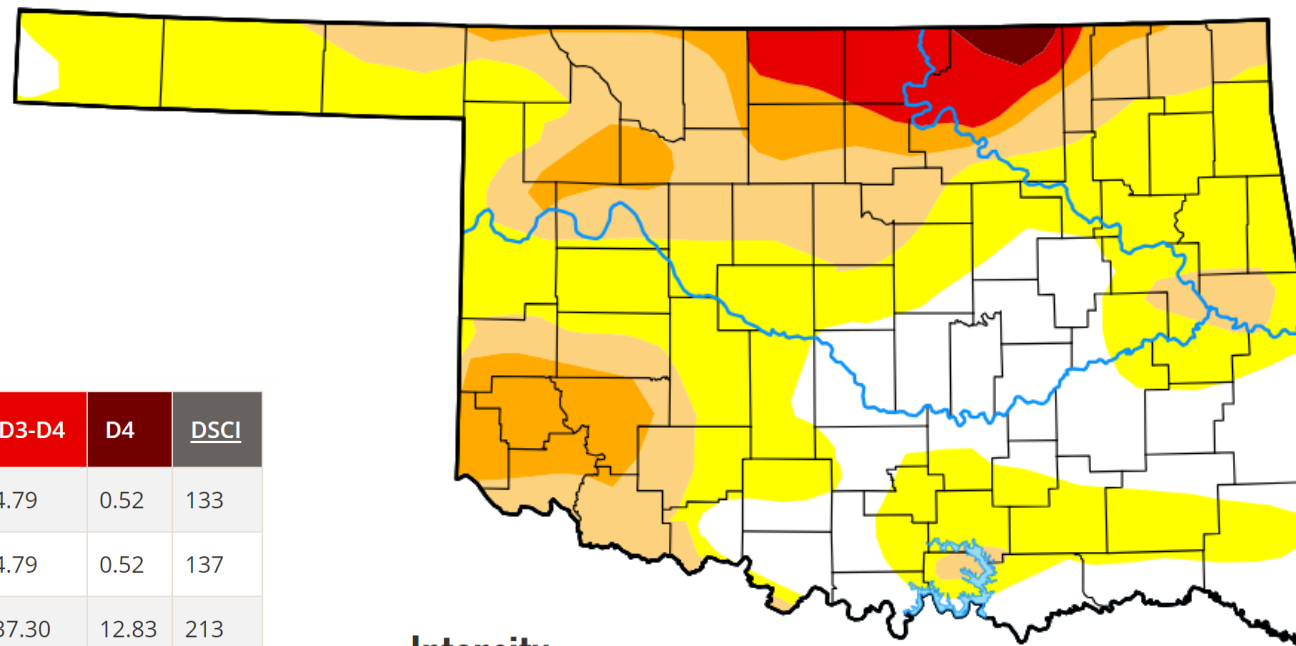
# U.S. DROUGHT MONITOR - OKLAHOMA



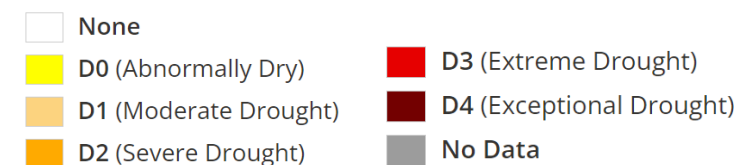
June 29, 2023

Abnormal dryness or drought are currently affecting approximately 711,618 people in Oklahoma.

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	<a href="#">2023-06-27</a>	23.06	76.94	36.08	14.26	4.79	0.52	133
Last Week to Current	<a href="#">2023-06-20</a>	26.79	73.21	41.91	16.59	4.79	0.52	137
3 Months Ago to Current	<a href="#">2023-03-28</a>	39.69	60.31	53.68	48.59	37.30	12.83	213
Start of Calendar Year to Current	<a href="#">2022-12-27</a>	1.82	98.18	89.73	80.92	56.13	11.65	337
Start of Water Year to Current	<a href="#">2022-09-27</a>	0.00	100.00	99.88	94.44	64.44	17.25	376
One Year Ago to Current	<a href="#">2022-06-28</a>	54.09	45.91	30.76	14.79	5.07	1.46	98



## Intensity



# U.S. DROUGHT MONITOR NATIONWIDE MAP



Map released: June 29, 2023

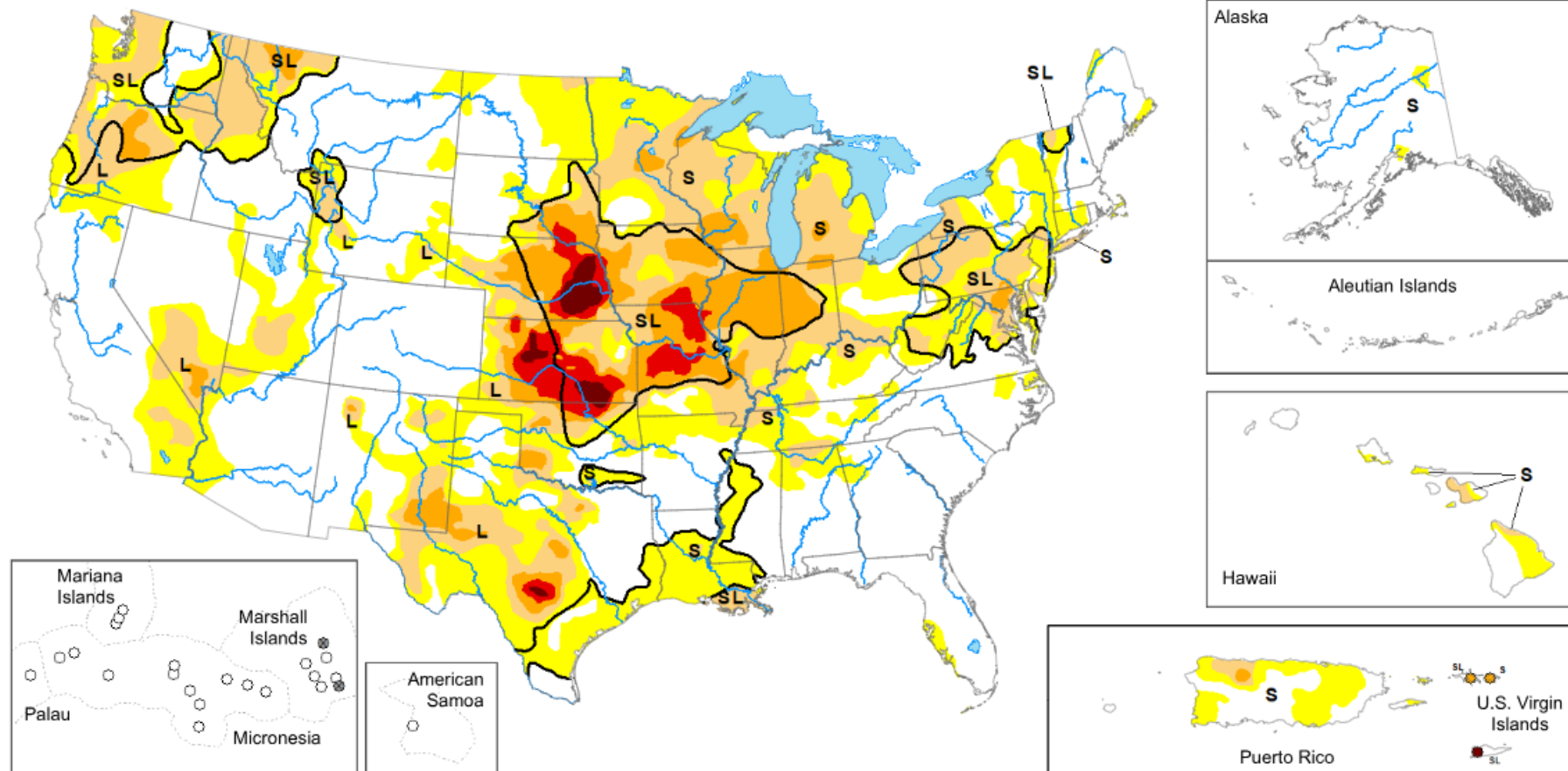
Data valid: June 27, 2023

## Intensity and Impacts



United States and Puerto Rico Author(s):  
*Deborah Bathke*, National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):  
*Ahira Sanchez-Lugo*, NOAA/NCEI



United States and Puerto Rico Author(s):  
*Curtis Riganti*, National Drought Mitigation Center

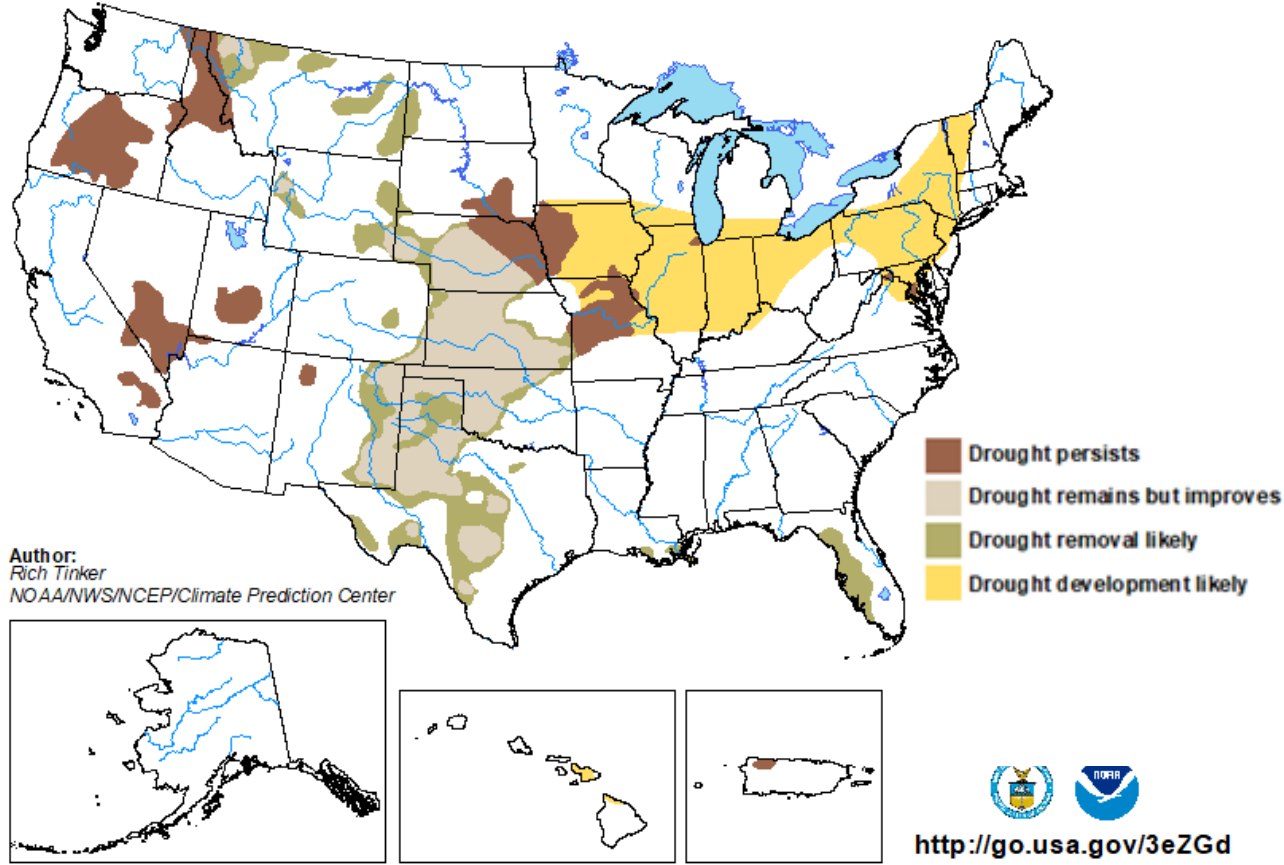
Pacific Islands and Virgin Islands Author(s):  
*Richard Tinker*, NOAA/NWS/NCEP/CPC

# U.S. DROUGHT MONITOR MONTHLY DROUGHT OUTLOOK MAP



## U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for June 2023  
Released May 31, 2023



Depicts large-scale trends based on subjectively derived probabilities guided by short and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. “Ongoing” drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

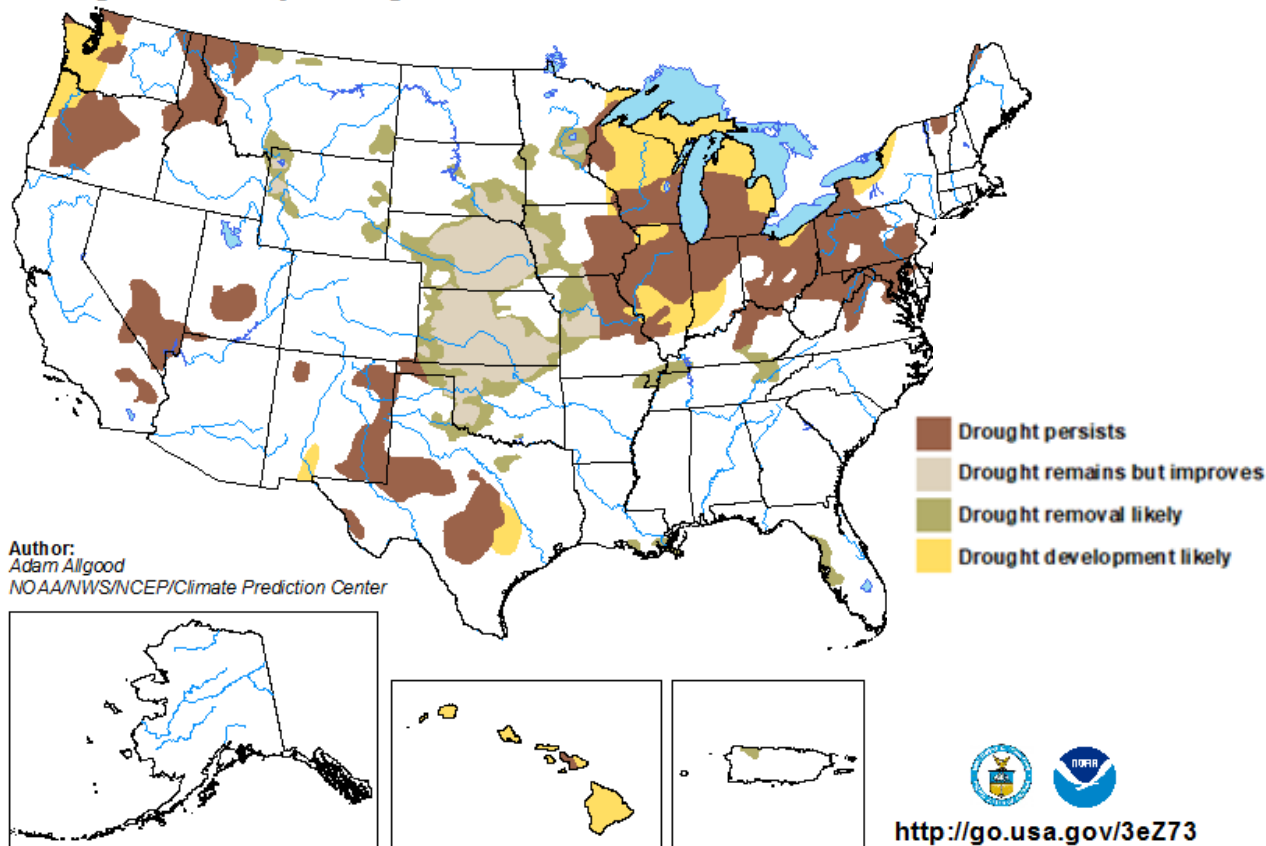
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

# U.S. DROUGHT MONITOR SEASONAL DROUGHT OUTLOOK MAP



## U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for June 15 - September 30, 2023  
Released June 15



Author:  
Adam Allgood  
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. “Ongoing” drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

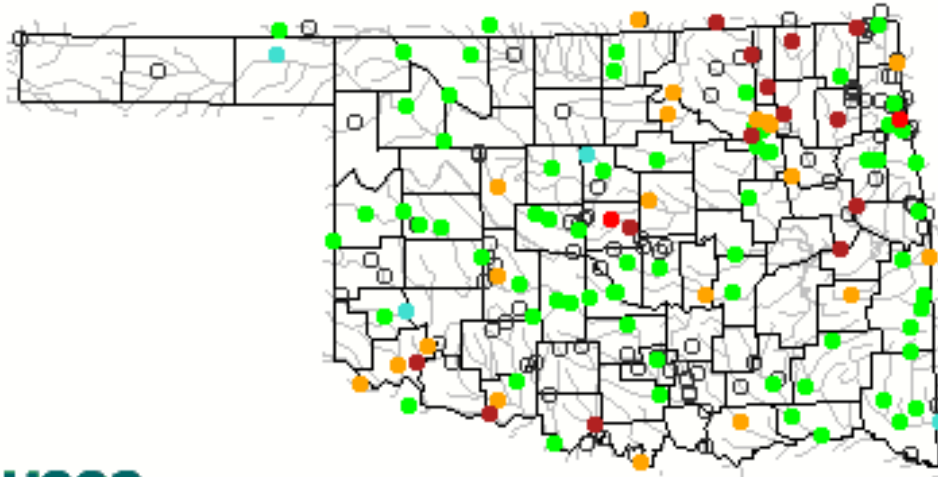
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).



# USGS STREAMFLOW DATA



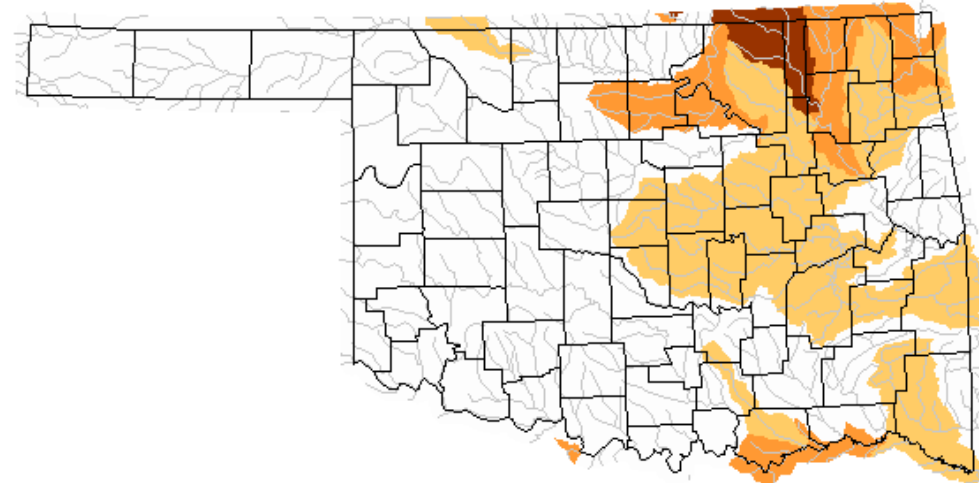
Thursday, June 29, 2023 11:30ET



Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: black;">○</span>
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

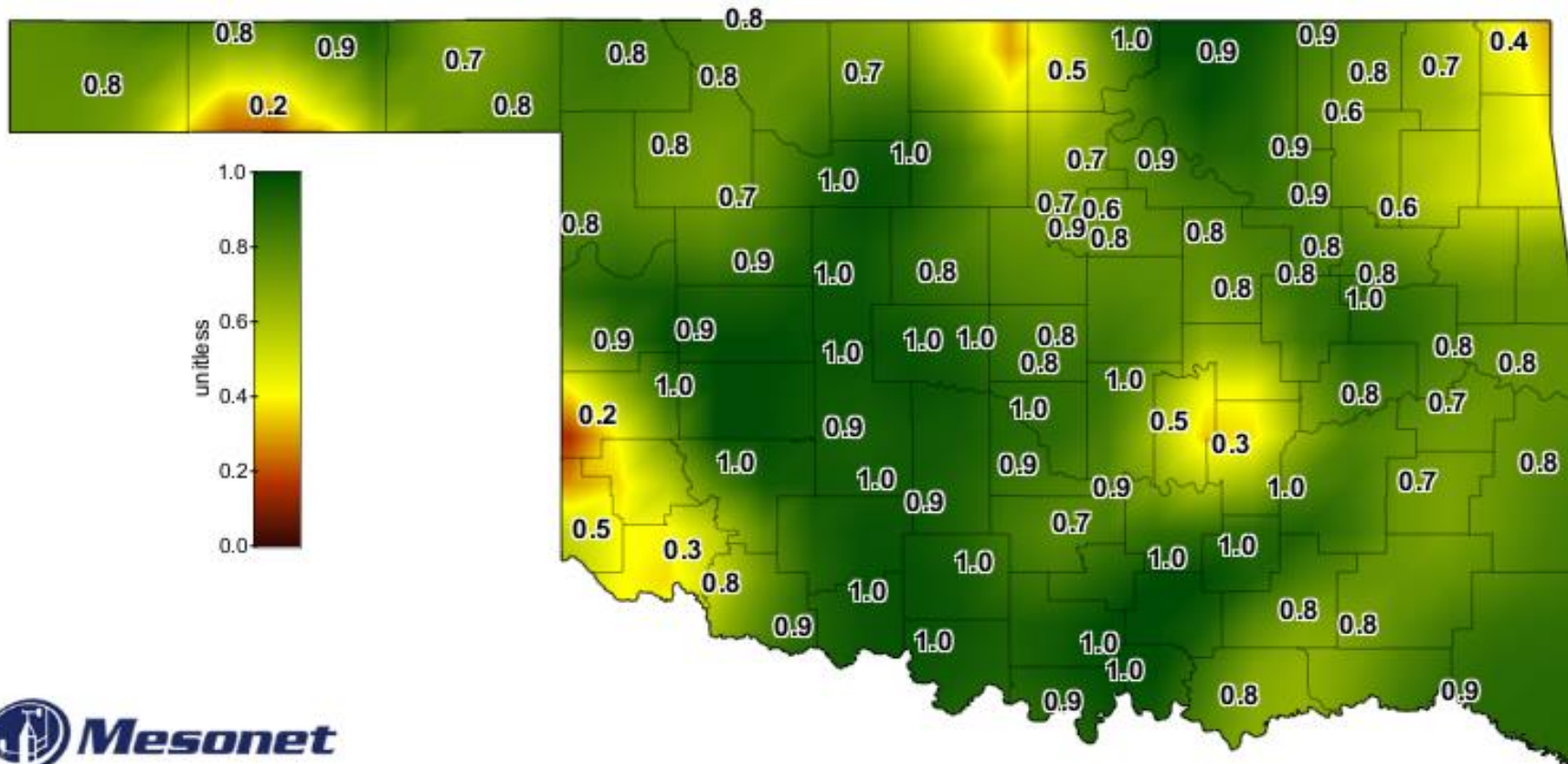
Below normal 28-day average streamflow

Wednesday, June 28, 2023



Explanation - Percentile classes				
<span style="background-color: red; color: black;"> </span>	<span style="background-color: brown; color: black;"> </span>	<span style="background-color: orange; color: black;"> </span>	<span style="background-color: yellow; color: black;"> </span>	<span style="background-color: lightgray; color: black;"> </span>
Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

# SOIL MOISTURE MAP



## 1-DAY AVERAGE 24-INCH FRACTIONAL WATER INDEX

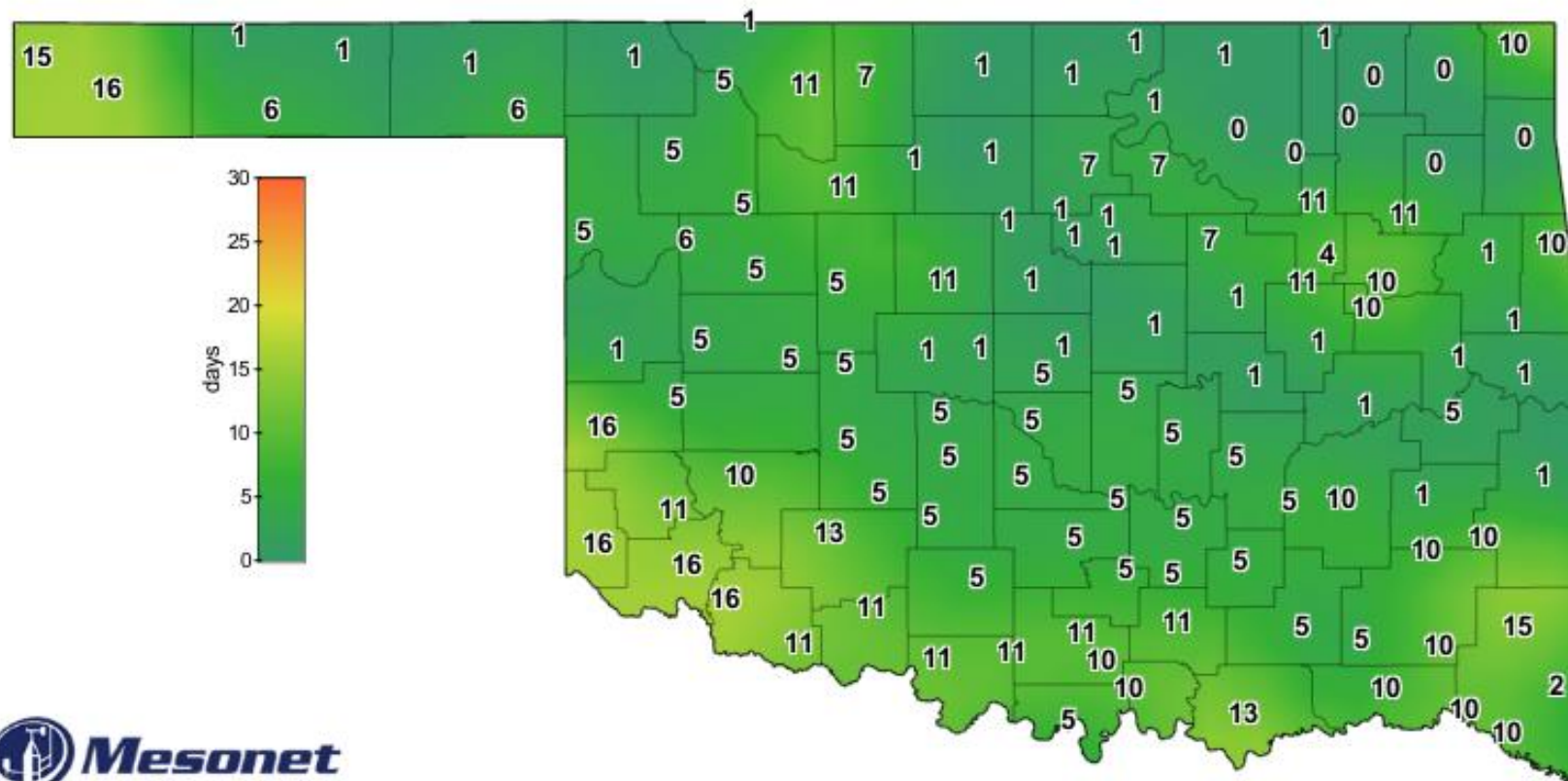


1-day Average 24-inch Fractional Water Index

June 28, 2023

Created 7:30:14 AM June 29, 2023 CDT. © Copyright 2023

# CONSECUTIVE DAYS WITHOUT RAINFALL MAP



CONSECUTIVE  
DAYS WITH LESS  
THAN 0.25"  
RAINFALL

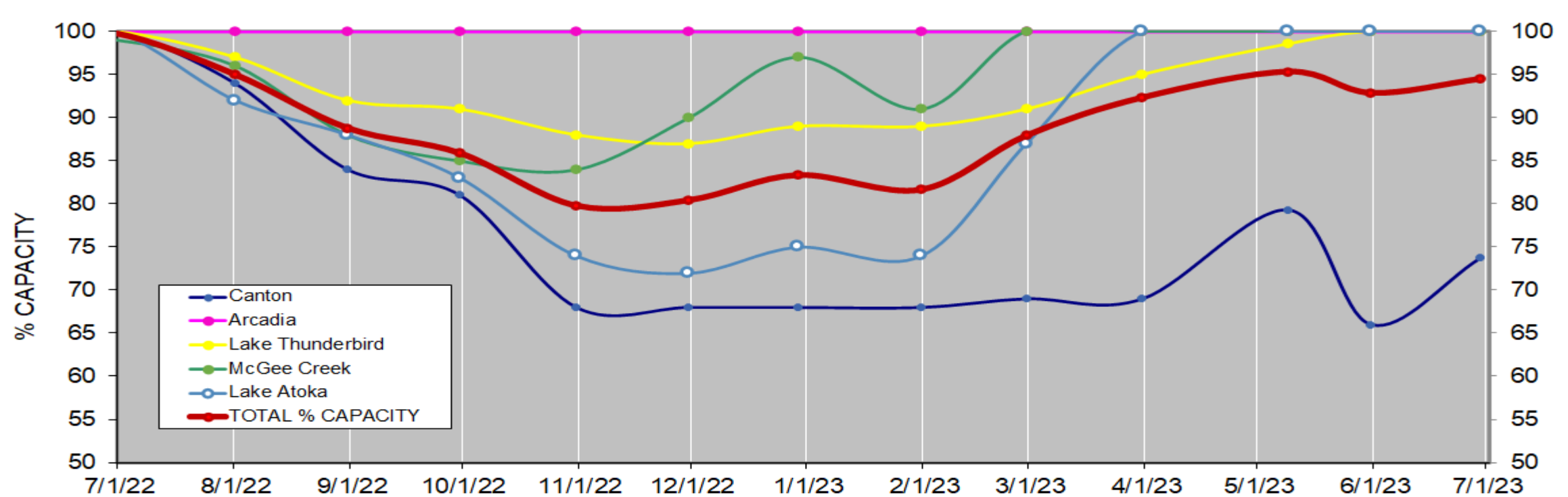


Consecutive Days With Less Than 0.25" Rainfall

June 28, 2023

Created 8:15:01 AM June 29, 2023 CDT. © Copyright 2023

# PERCENTAGE OF SURFACE WATER CONSERVATION CAPACITY IN CENTRAL OK RESERVOIRS

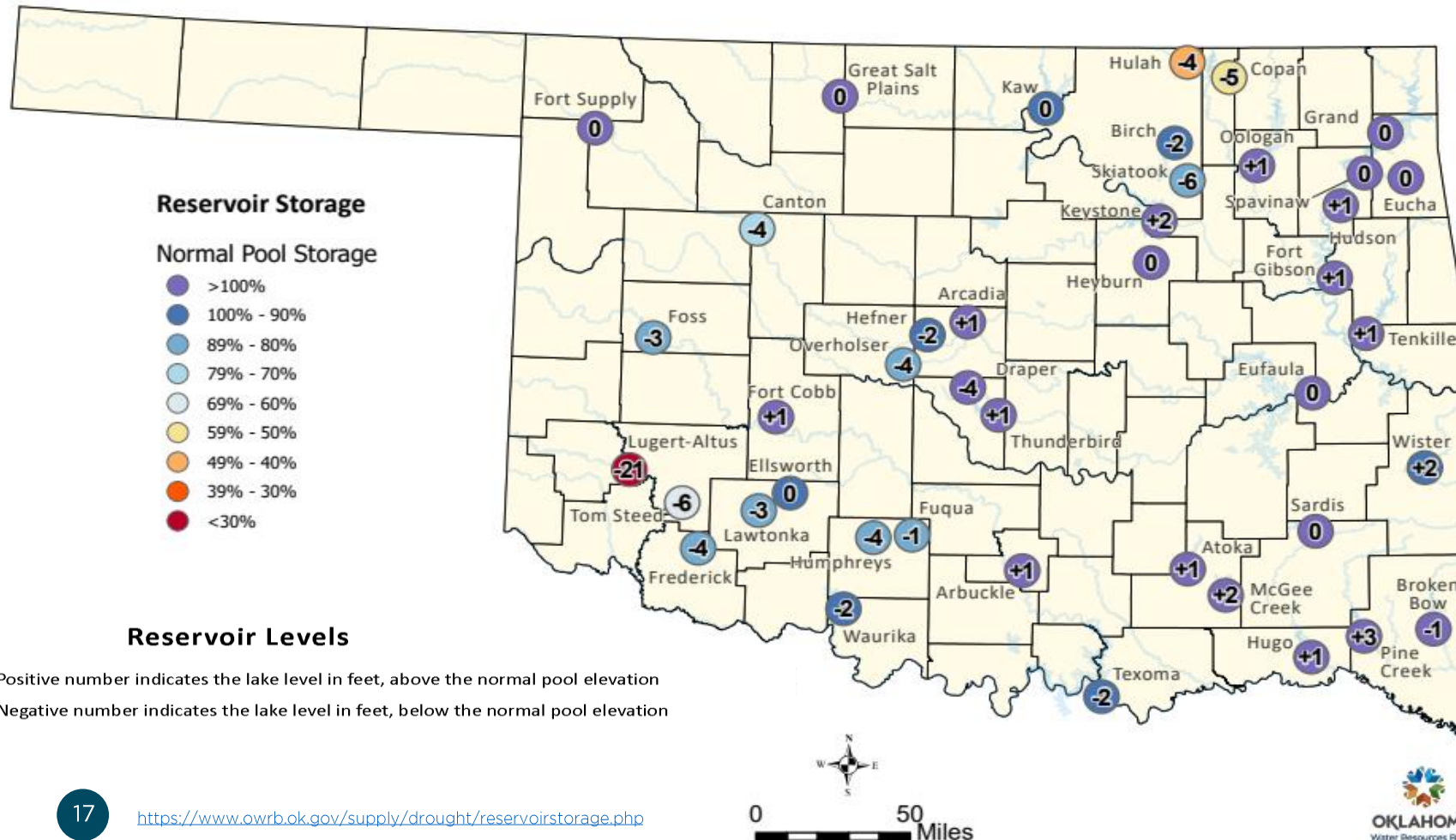


LAKE	% CAPACITY	% CHANGE FROM 5/31/2023
Canton	73.7	7.7
Arcadia	100.0	0.0
Lake Thunderbird	100.0	0.0
McGee Creek	100.0	0.0
Lake Atoka	100.0	0.0
TOTAL % CAPACITY	94.5	1.6

Lake Hefner and Lake Overholser are terminal storage for Canton Lake. Lake Draper is terminal storage for McGee Creek and Atoka Lakes.



# OKLAHOMA RESERVOIR LEVELS AND STORAGE

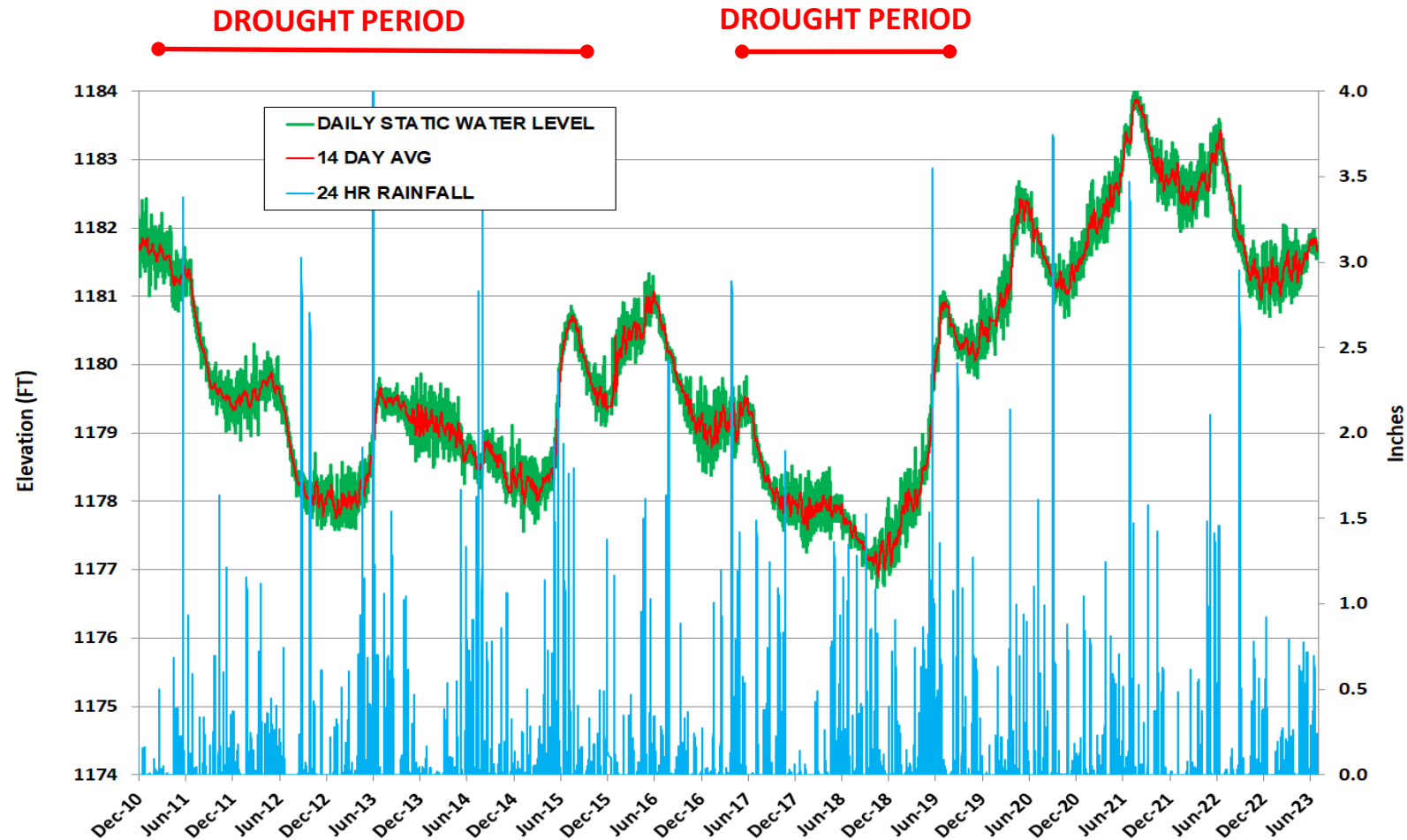


## OKLAHOMA RESERVOIR LEVELS AND STORAGE AS OF 06/26/2023

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 ([USGS Current Conditions for USGS 07333010 Atoka Reservoir near Stringtown, OK](https://www.usgs.gov/monitoring/products-reports/70000173nowaterconditionsforusgs07333010atoka-reservoir-near-stringtown-ok)). For more information, please visit the OWRB's website: (<https://www.owrb.ok.gov>).



# GROUNDWATER LEVELS SPENCER MESONET STATION



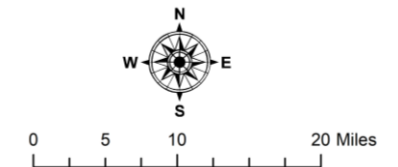
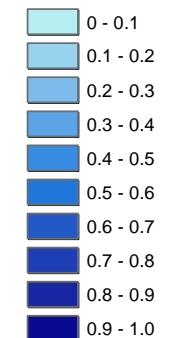
# AQUIFER RECHARGE – June 2023



- Mean aquifer recharge in June 2023 was 0.01 inches.
- Normal recharge for June is 0.35 inches.
- This is 1.17 inches below the cumulative yearly average at this time.



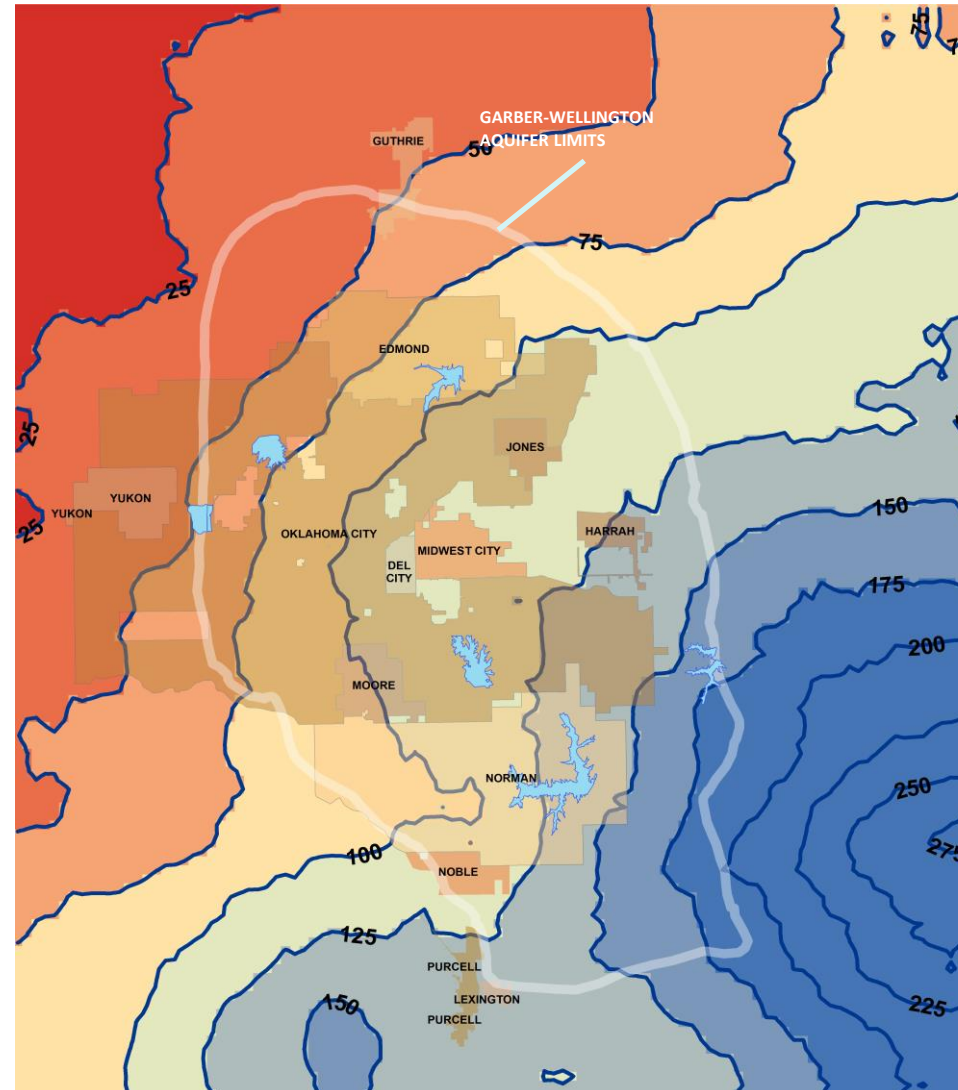
Recharge in Inches



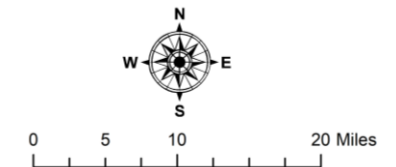
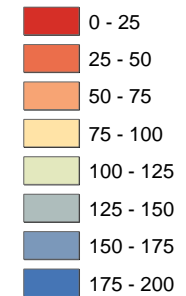
# PERCENT TOTAL CUMULATIVE AQUIFER RECHARGE – Jan-Jun 2023



- Most of the recharge for 2023 so far this year is south and east of Shawnee.
- Recharge for the central Oklahoma metro area is only about 75 percent of normal.
- Normal cumulative recharge for Jan-Jun 2023 is 1.81 inches.



Percent of Cumulative Recharge

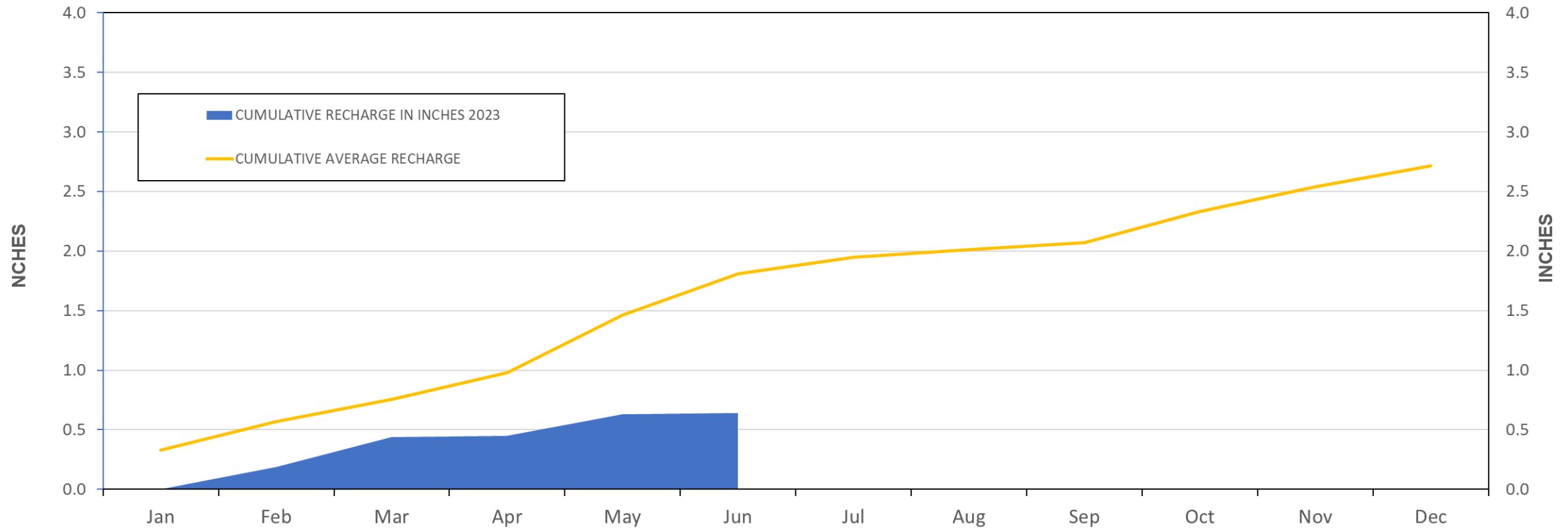




# RECHARGE CHARTS CENTRAL OKLAHOMA AQUIFER SYSTEM



## ACCUMULATED CENTRAL OKLAHOMA AQUIFER SYSTEM RECHARGE 2023

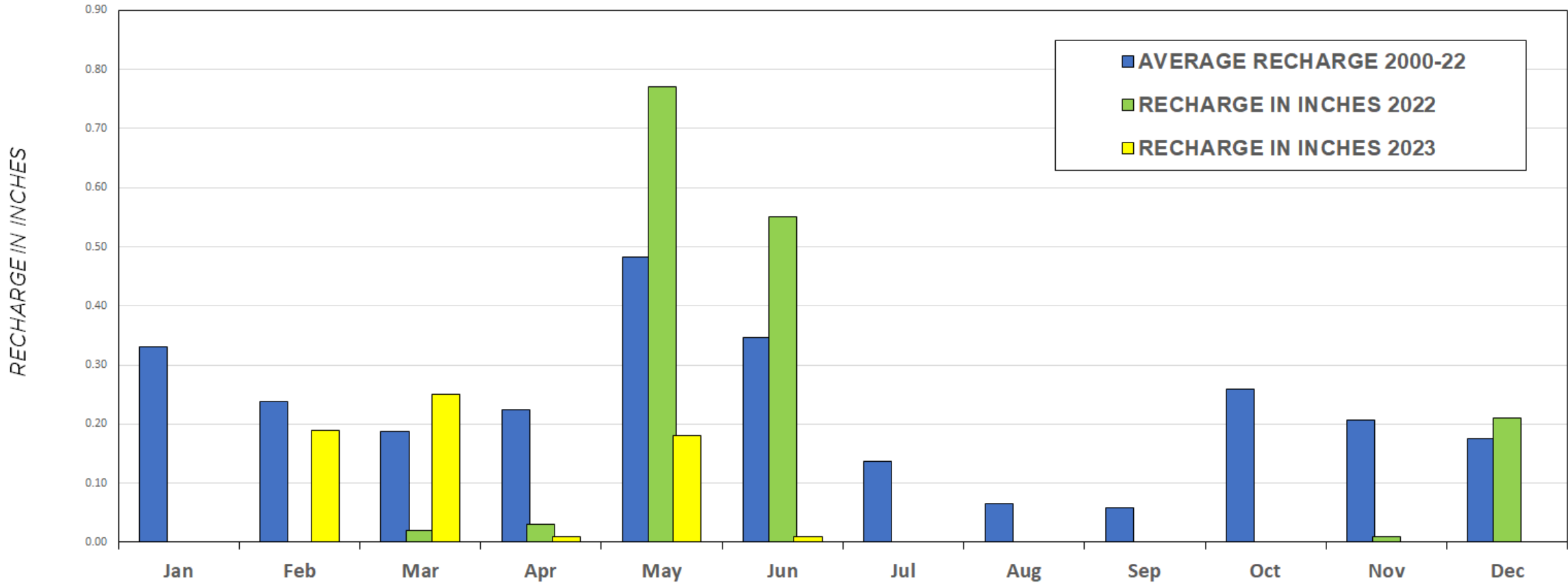


# RECHARGE CHARTS CENTRAL OKLAHOMA

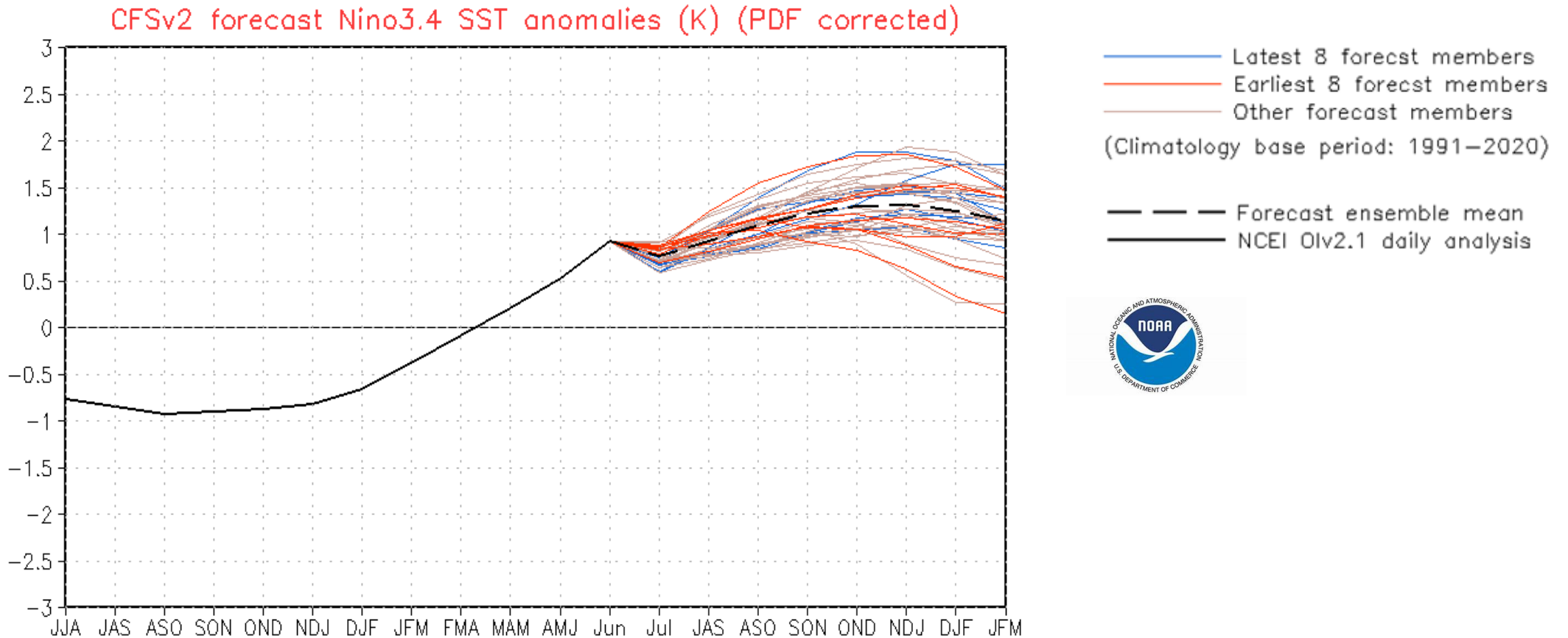
## AQUIFER SYSTEM CONTINUED



### MONTHLY AQUIFER RECHARGE 2023



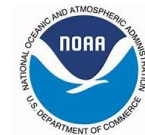
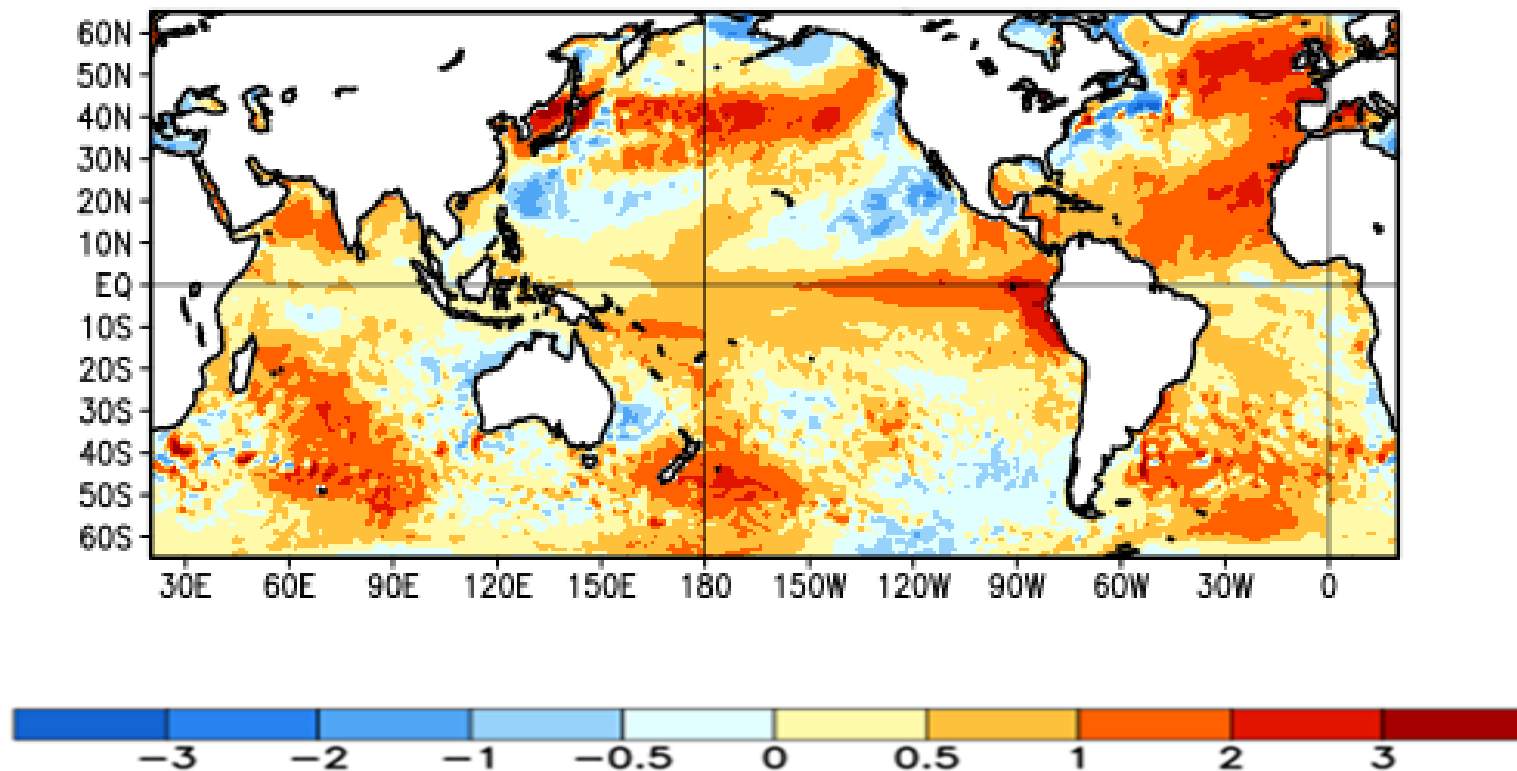
# ENSO CYCLE - RECENT EVOLUTION, CURRENT STATUS AND PREDICTIONS



# ENSO CYCLE - RECENT EVOLUTION, CURRENT STATUS AND PREDICTIONS



Average SST Anomalies  
28 MAY 2023 – 24 JUN 2023







## ENSO ALERT SYSTEM STATUS: El Niño Advisory

- ENSO-neutral conditions are observed.
- Equatorial sea surface temperatures (SSTs) are near-to-above average across most of the Pacific Ocean.
- The tropical Pacific atmospheric anomalies are consistent with weak El Niño conditions.
- El Niño conditions are expected to gradually strengthen into the Northern Hemisphere winter 2023-24.



# QUESTIONS?

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ASSOCIATION OF  
CENTRAL OKLAHOMA  
GOVERNMENTS