DROUGHT CONDITIONS

IN CENTRAL OKLAHOMA

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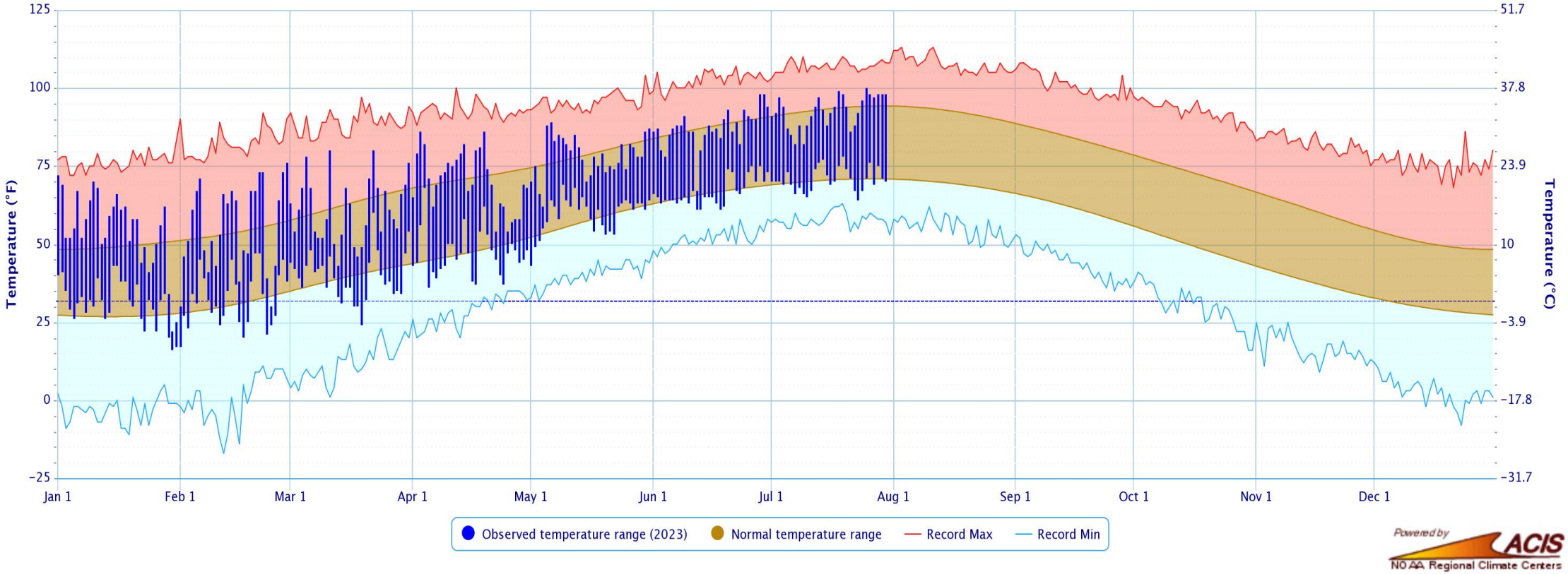
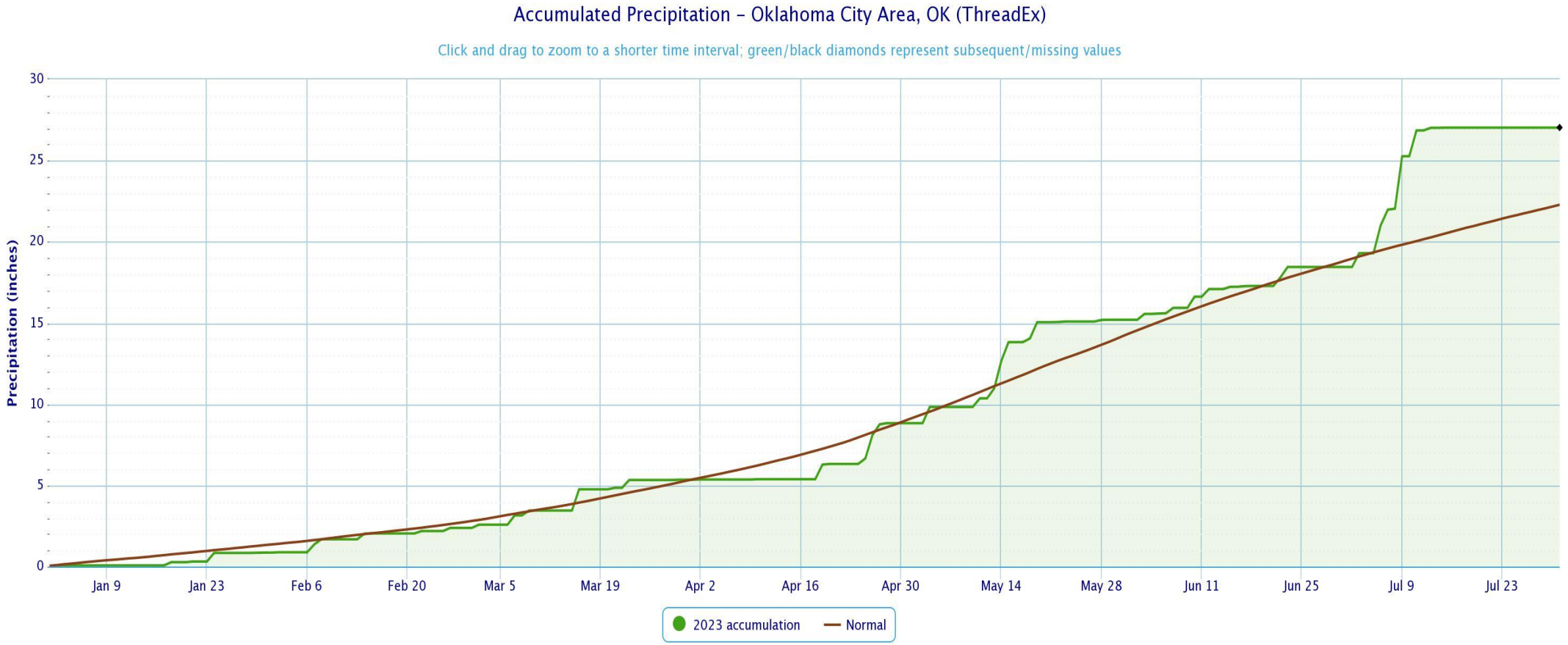
August 1, 2023

TEMPERATURE PLOT FOR OKLAHOMA CITY, OKLAHOMA FOR 2023



http://xmacis.rcc-acis.org/

PRECIPITATION PLOT FOR OKLAHOMA CITY, OKLAHOMA FOR 2023



http://xmacis.rcc-acis.org/

RAINFALL SUMMARIES BY OKLAHOMA CLIMATE DIVISION

Calendar Year 01-Jan-2022 though 30-Jul-2023

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	22.38"	+5.40"	132%	10th wettest	5.13" (2011)	27.89" (2015)
Central	23.85"	+1.36"	106%	31st wettest	8.49" (1936)	39.19" (2007)
S. Central	24.03"	-0.33"	99%	44th wettest	10.84" (2011)	47.68" (2015)
Statewide	22.95"	+1.15"	105%	38th wettest	9.66" (1936)	34.18" (2015)

Water Year: 01-Oct-2021 through 30-Jul-2023

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	27.51"	+4.99"	122%	14th wettest	9.67" (2010-11)	35.75" (2018-19)
Central	30.80"	+0.20"	101%	34th wettest	15.82" (1935-36)	46.19" (2006-07)
S. Central	33.81"	-0.24"	99%	36th wettest	14.87" (1955-56)	56.50" (2014-15)
Statewide	30.40"	+0.52"	102%	35th wettest	16.70" (1955-56)	41.02" (2014-15)

Summer Jun 01 through 30-Jul-2023

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	14.71"	+8.54"	238%	1st wettest	1.48" (2011)	11.36" (1962)
Central	10.59"	+2.91"	138%	16th wettest	1.88" (1954)	18.87" (2007)
S. Central	8.88"	+1.39"	119%	26th wettest	0.59" (2011)	15.31" (1945)
Statewide	9.82"	+2.51"	134%	19th wettest	1.93" (2011)	14.10" (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.

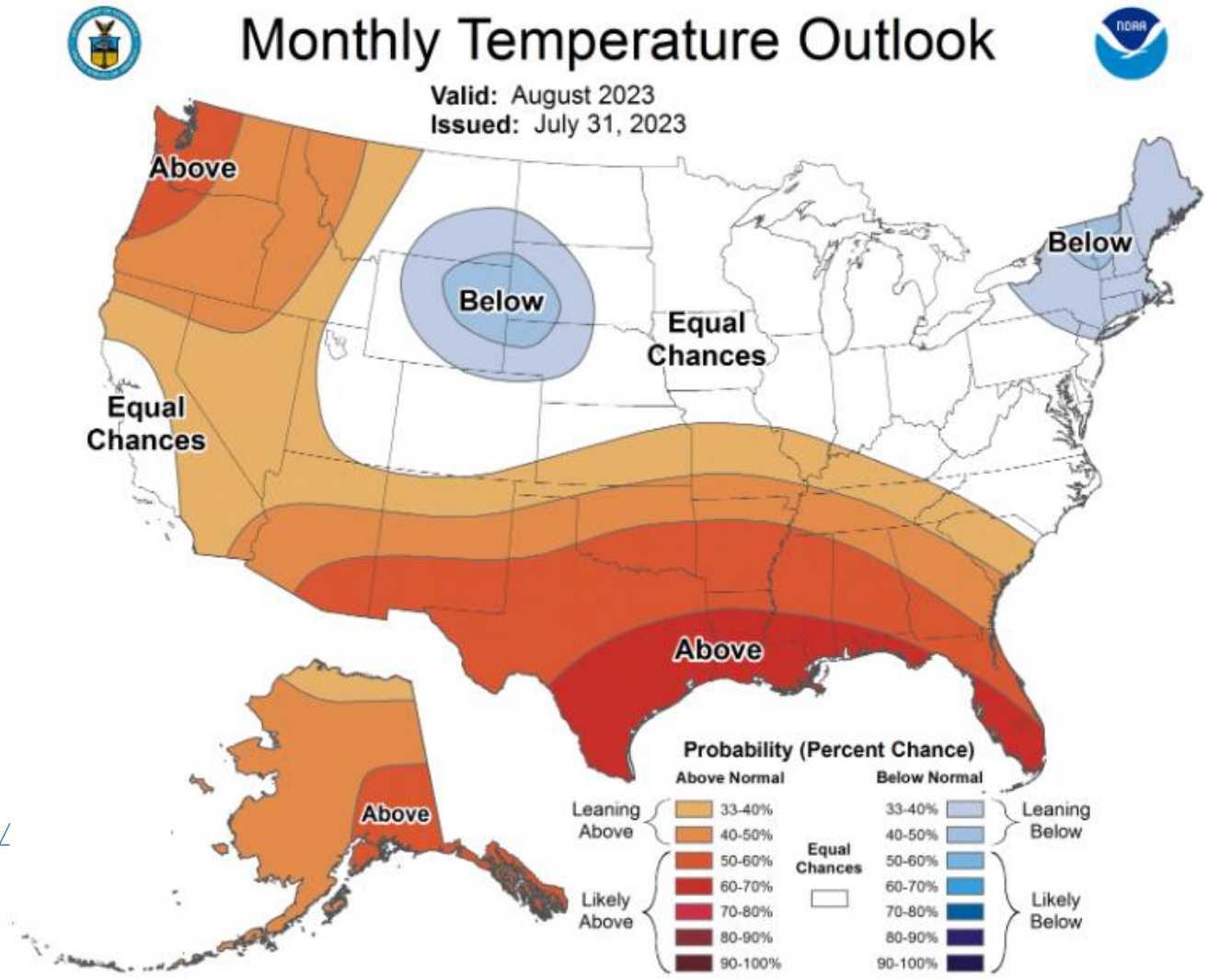
http://climate.ok.gov/index.php/drought/last_30_days/drought_wildfire

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)/



NOAA ONE-MONTH PRECIPITATION OUTLOOK

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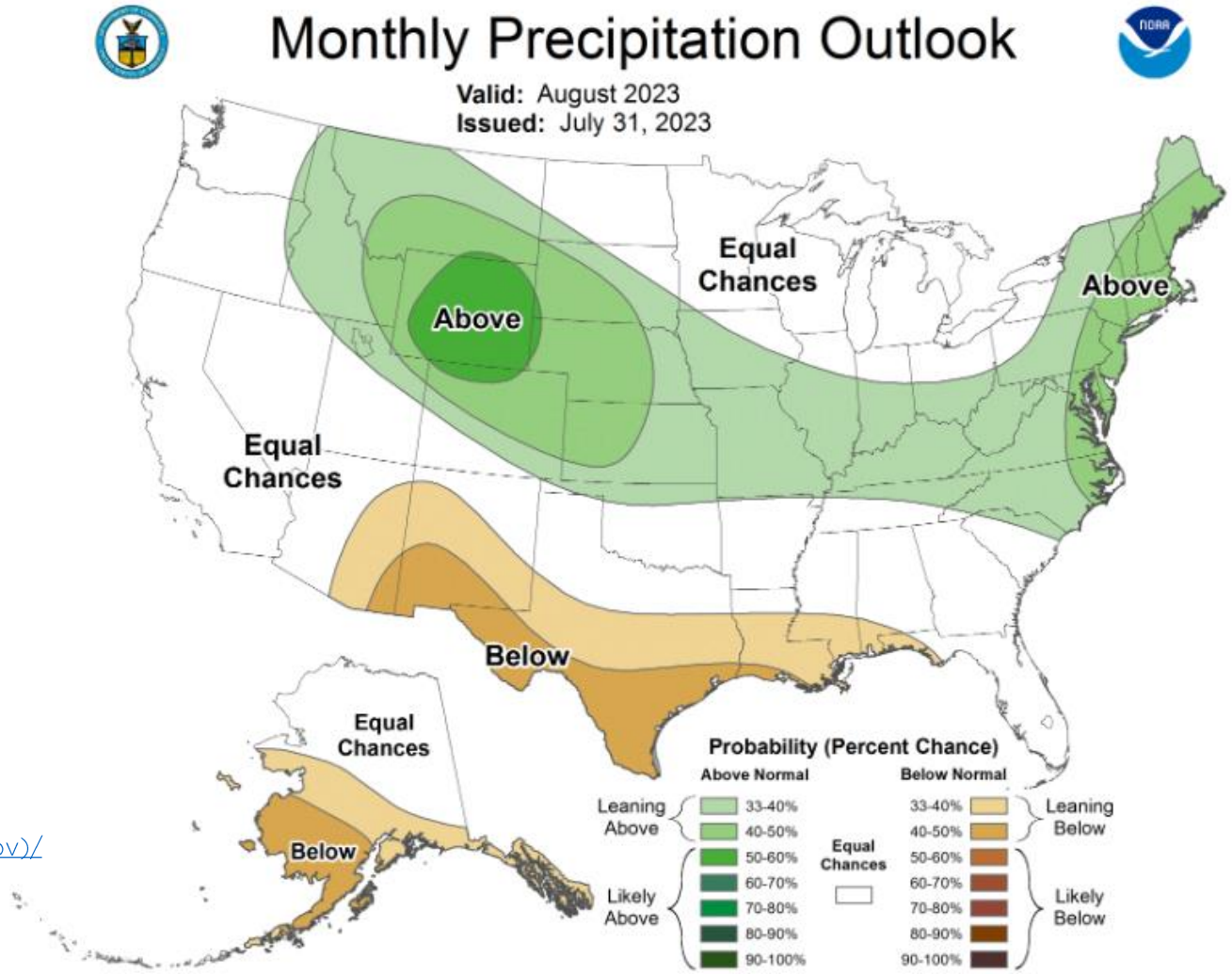
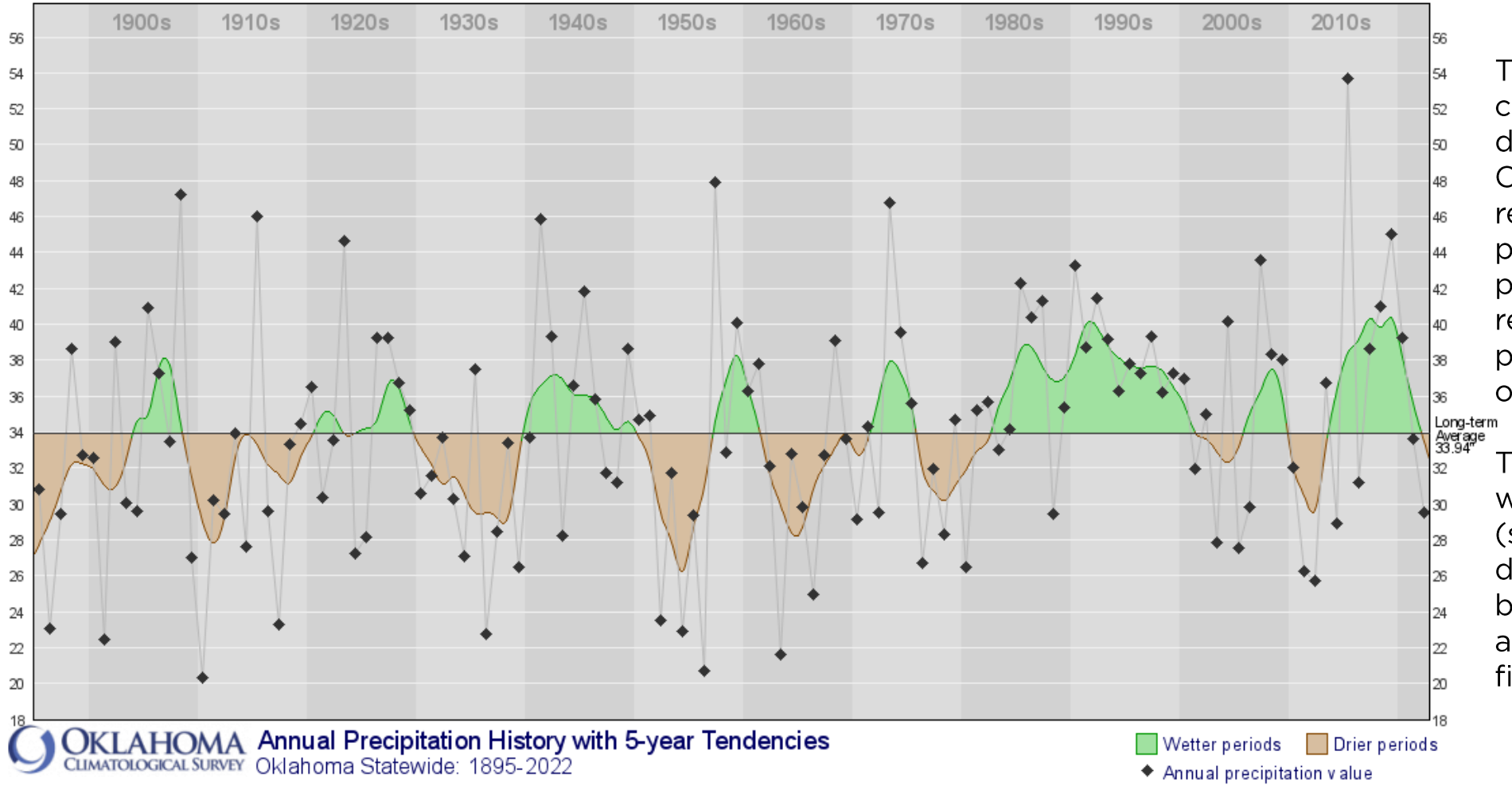


Annual Precipitation History with 5-Year Tendencies

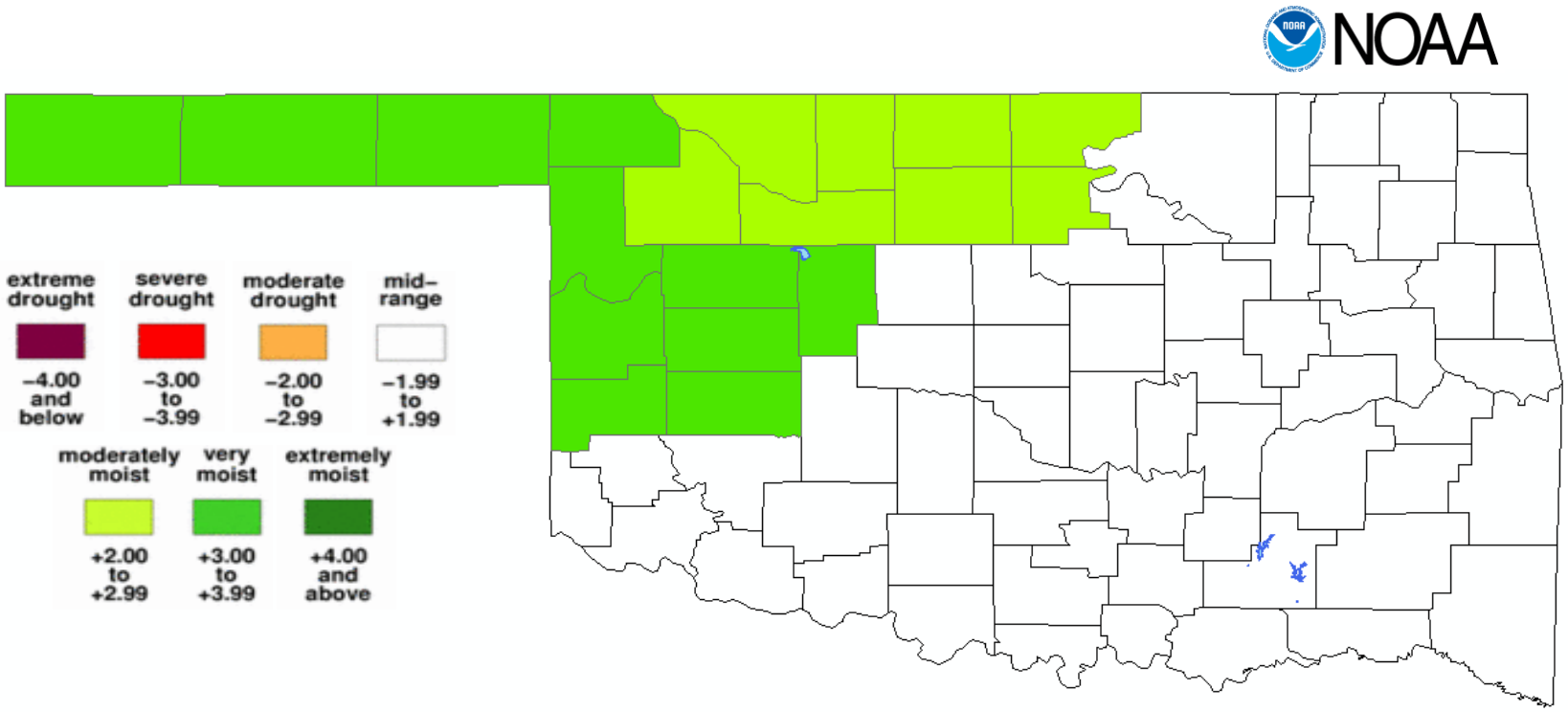


This graph shows the cyclical nature of wet and drought periods in Oklahoma. The black dots represent the annual precipitation for that particular year. The line represents the annual precipitation data smoothed over five years.

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.

http://climate.ok.gov/index.php/climate/climate_trends/precipitation_history_annual_statewide/CD00/prcp/Annual/oklahoma_south-central_u.s

DROUGHT SEVERITY INDEX BY CLIMATE DIVISION



PALMER VALUE

22 Jul 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.

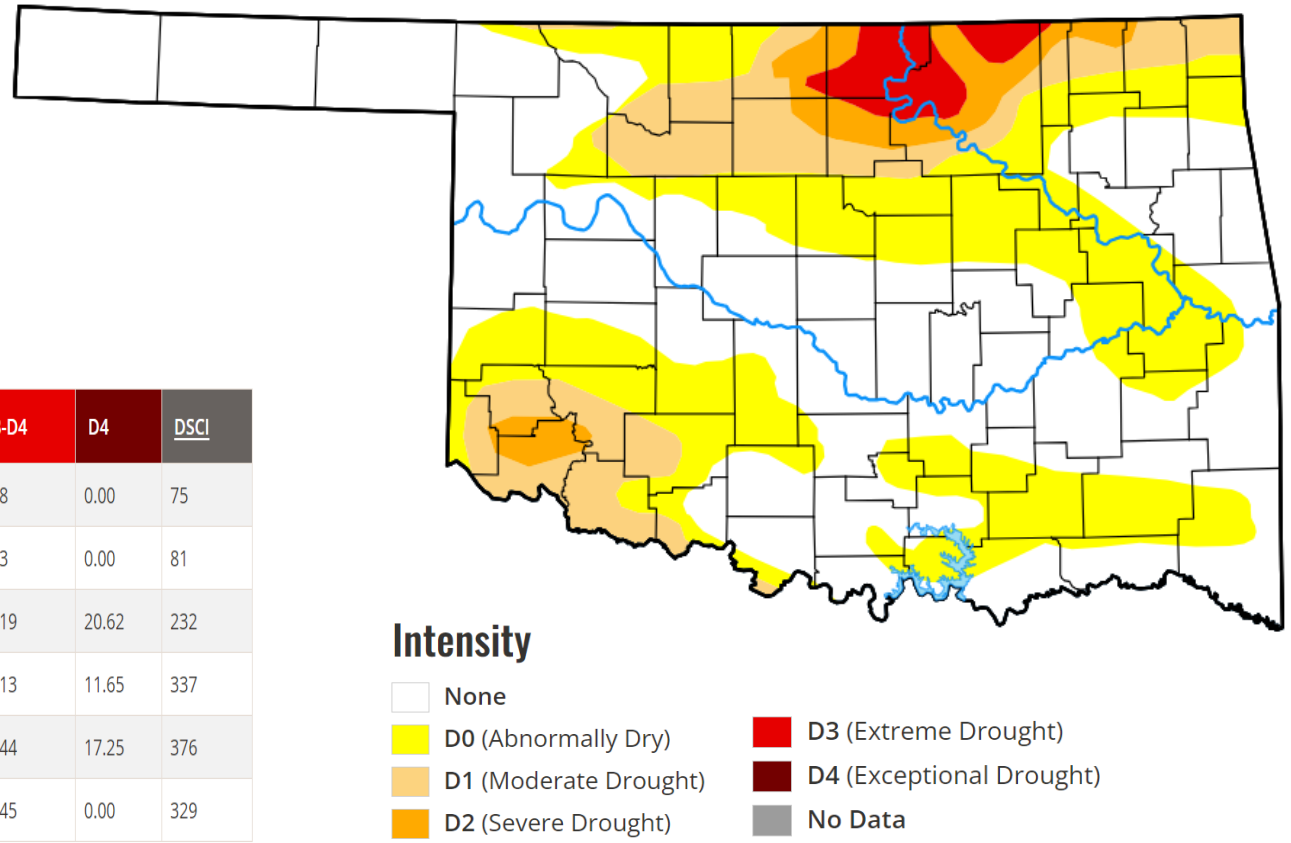
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/palmer_drought/wpdsouth.txt

U.S. DROUGHT MONITOR - OKLAHOMA

July 25, 2023

Abnormal dryness or drought are currently affecting approximately 356,962 people in Oklahoma.

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2023-07-25	52.39	47.61	17.76	6.64	2.58	0.00	75
Last Week to Current	2023-07-18	49.93	50.07	20.32	7.31	3.23	0.00	81
3 Months Ago to Current	2023-04-25	35.48	64.52	54.07	49.87	43.19	20.62	232
Start of Calendar Year to Current	2022-12-27	1.82	98.18	89.73	80.92	56.13	11.65	337
Start of Water Year to Current	2022-09-27	0.00	100.00	99.88	94.44	64.44	17.25	376
One Year Ago to Current	2022-07-26	0.00	100.00	99.81	92.11	37.45	0.00	329



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM NIDIS Drought.gov U.S. Drought Portal

https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OK

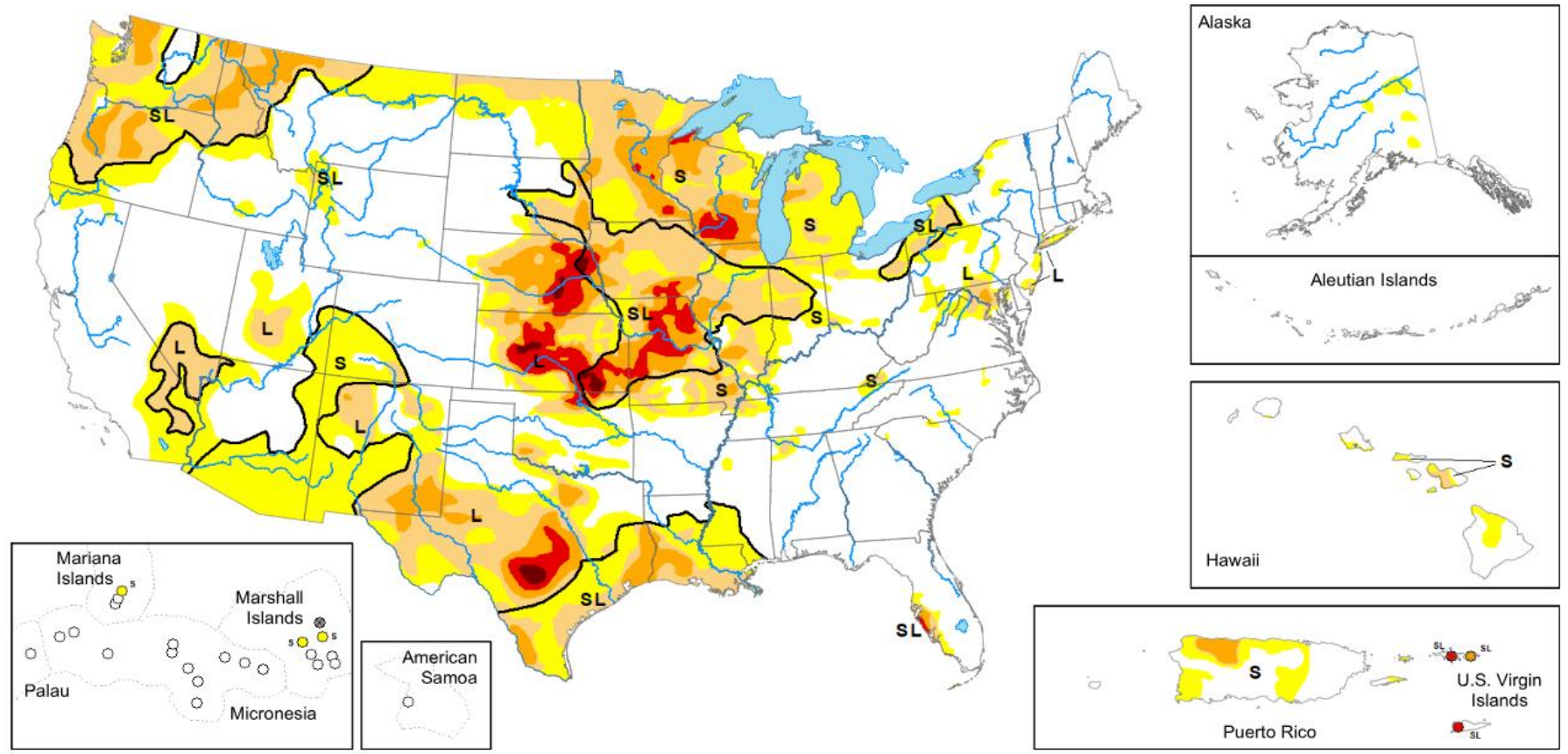
U.S. DROUGHT MONITOR NATIONWIDE MAP

Map released: July 27, 2023

Data valid: July 25, 2023

Intensity and Impacts

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data



United States and Puerto Rico Author(s):
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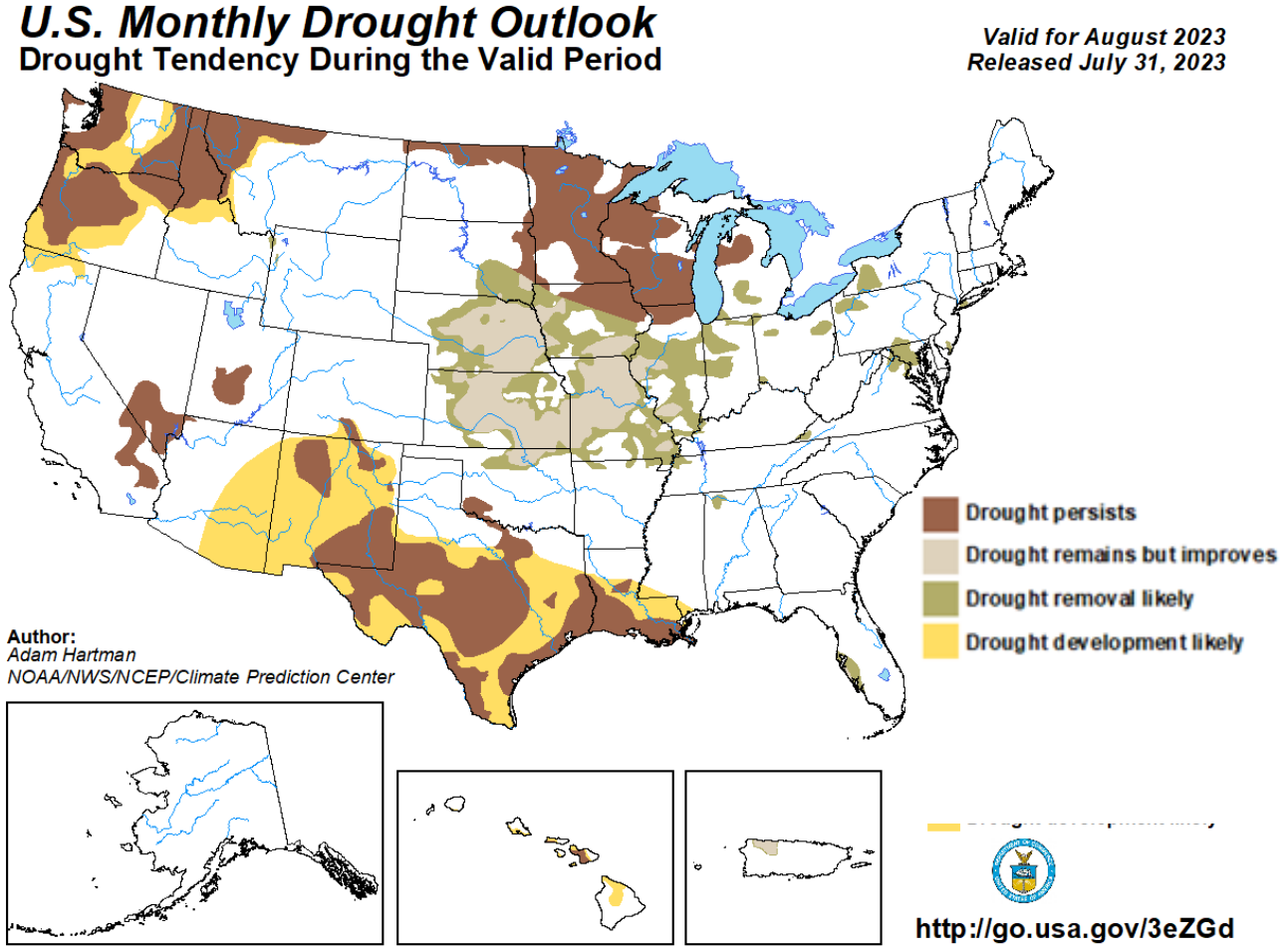
Pacific Islands and Virgin Islands Author(s):
Ahira Sanchez-Lugo, NOAA/NCEI

United States and Puerto Rico Author(s):
Brian Fuchs, National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):
Brad Rippey, U.S. Department of Agriculture

http://droughtmonitor.unl.edu

U.S. DROUGHT MONITOR MONTHLY DROUGHT OUTLOOK MAP

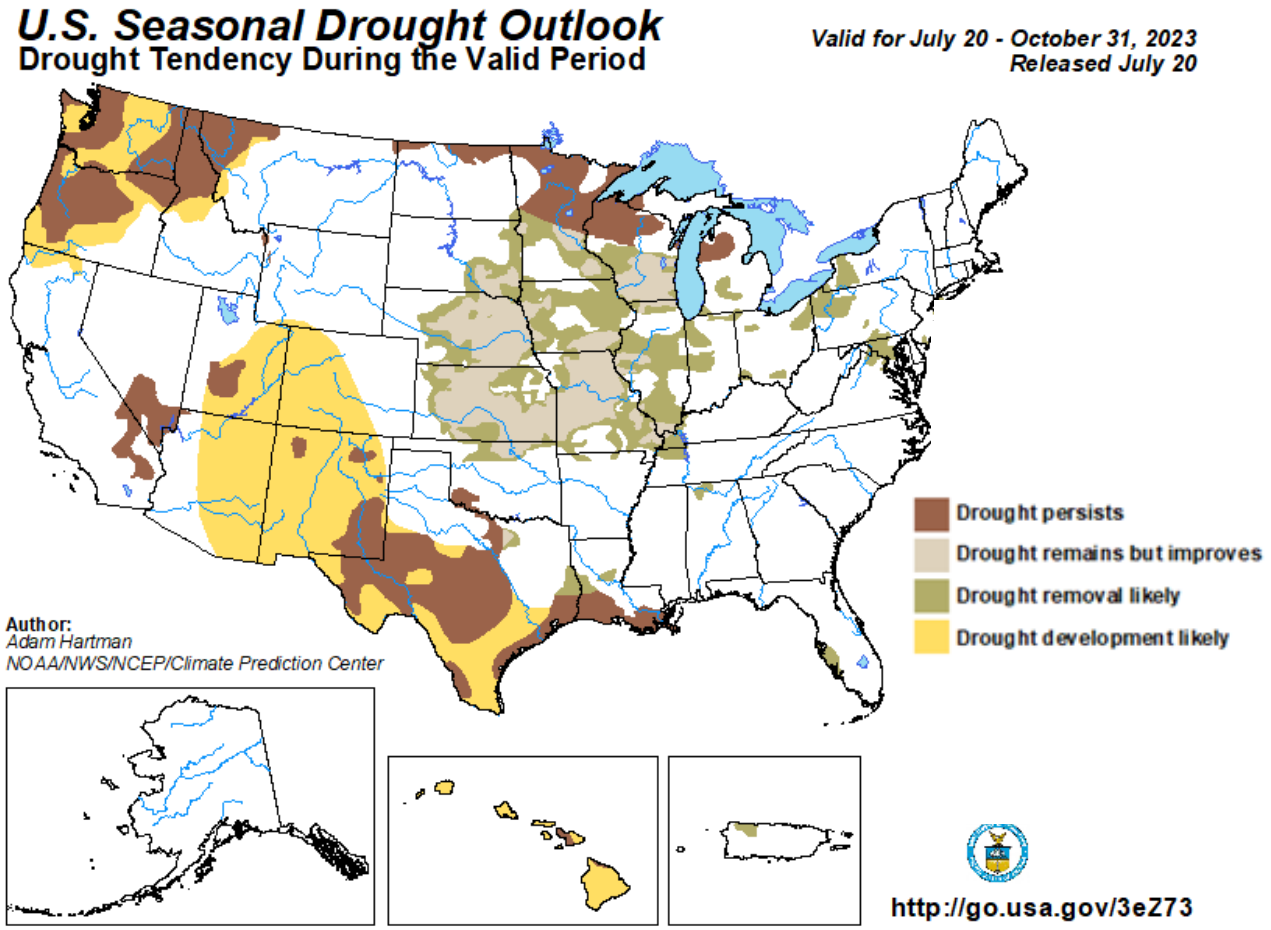


Depicts large-scale trends based on subjectively derived probabilities guided by short and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. “Ongoing” drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to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

http://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php

U.S. DROUGHT MONITOR SEASONAL DROUGHT OUTLOOK MAP



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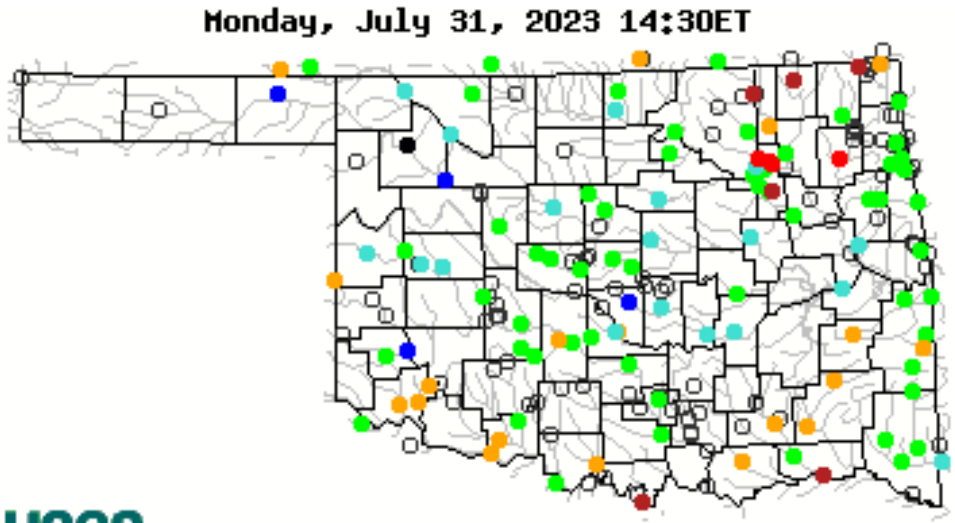
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

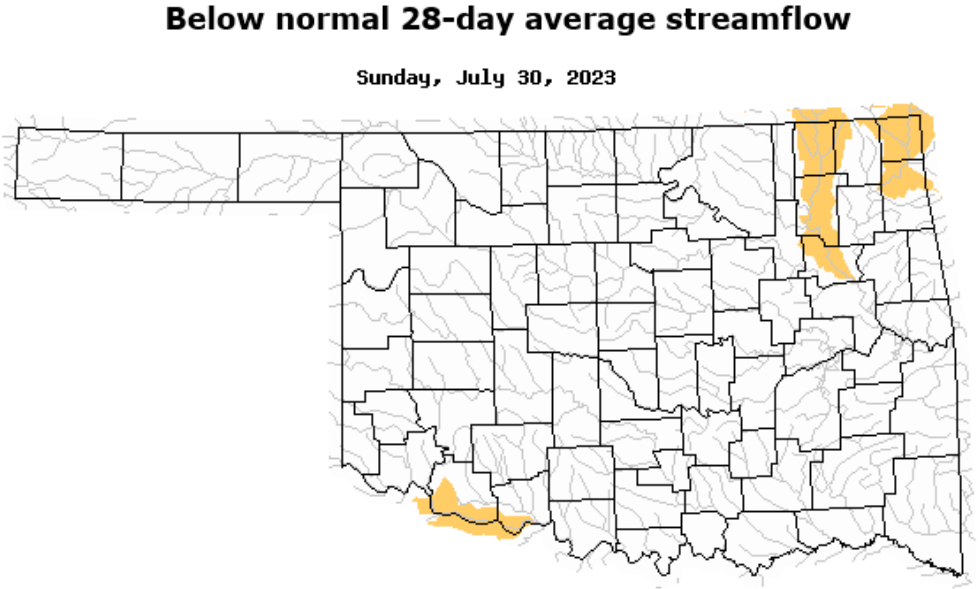
https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php

USGS STREAMFLOW DATA



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



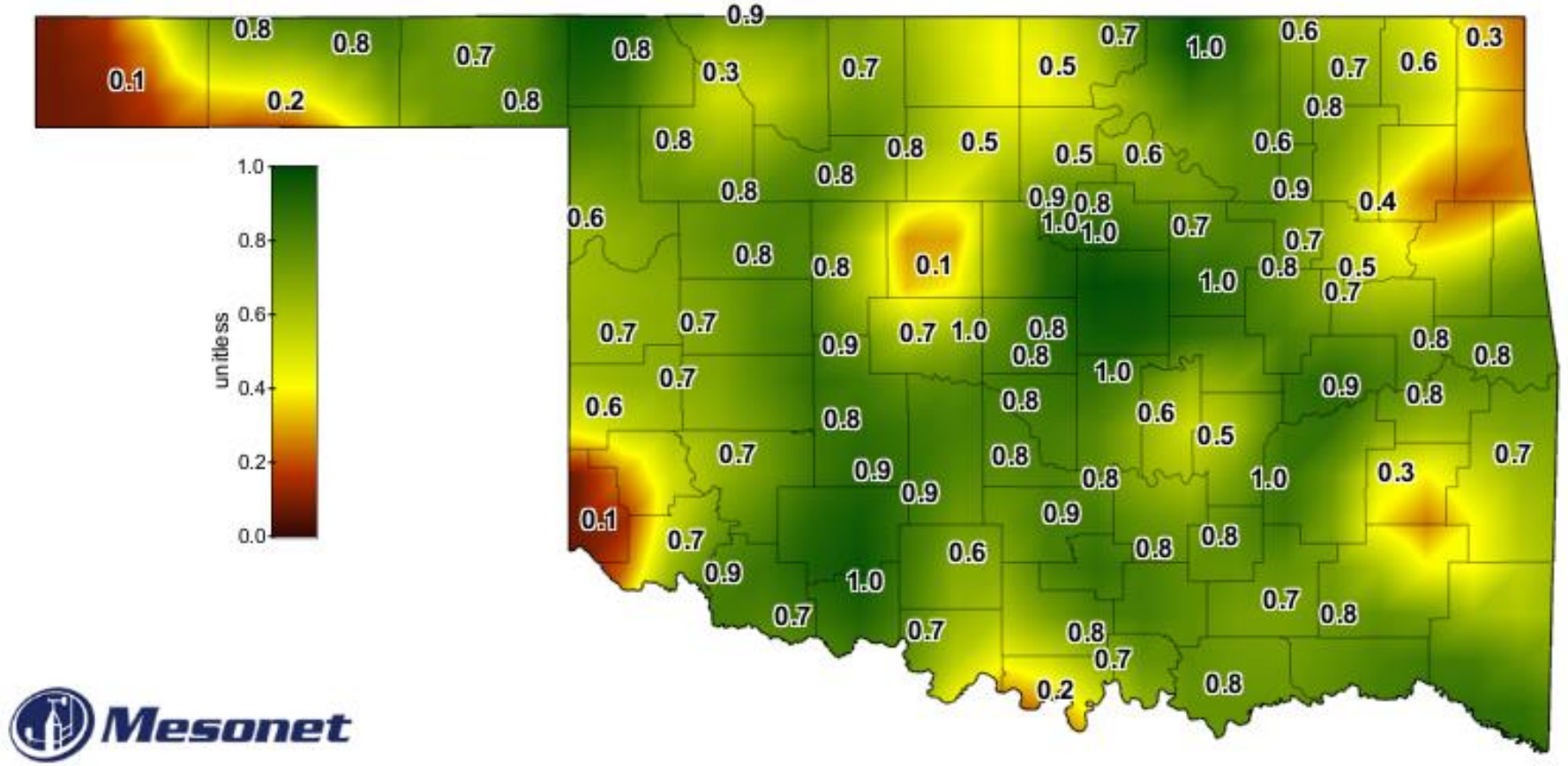
USGS

Explanation - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

https://waterdata.usgs.gov/ok/nwis/rt

https://waterwatch.usgs.gov/index.php?id=pa28d_dry&sid=w__maplm__pa28d_dwc&r=o_

SOIL MOISTURE MAP



1-DAY AVERAGE 24-INCH FRACTIONAL WATER INDEX

- 1.0 - 0.8 Enhanced Growth
- 0.8 – 0.5 Limited Growth
- 0.5 – 0.3 Plants Wilting
- 0.3 - 0.1 Plants Dying
- < 0.1 Barren Soil

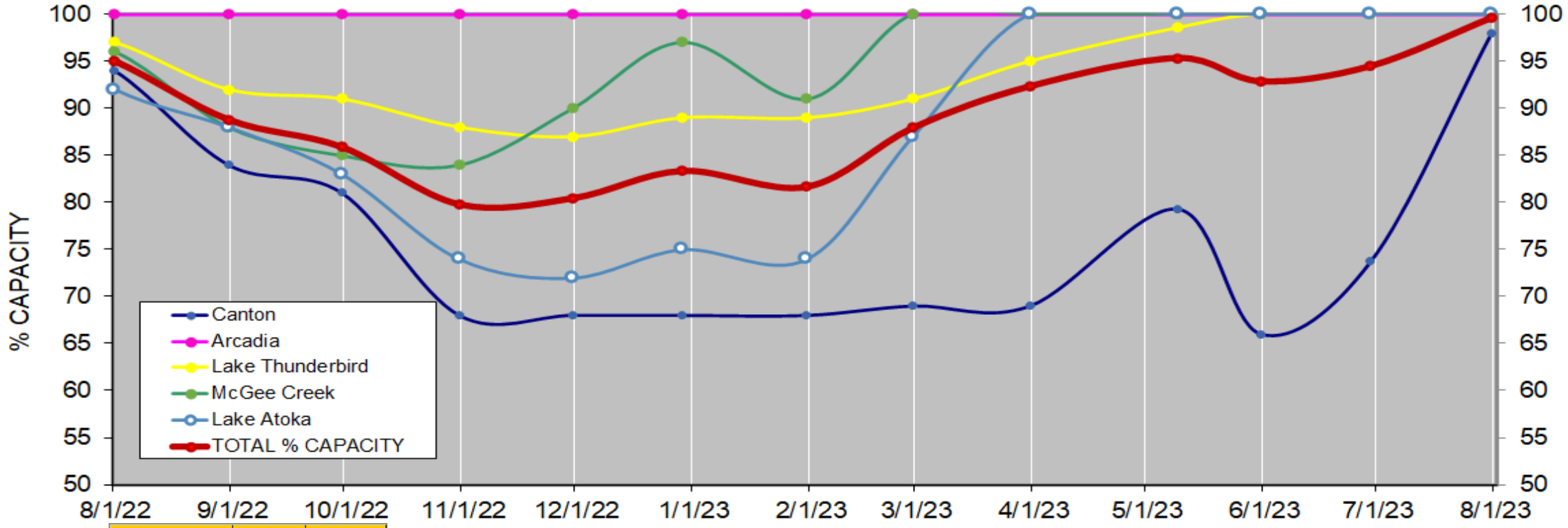
http://www.mesonet.org/index.php/weather/map/24-inch_fractional_water_index/soil_moisture

CONSECUTIVE DAYS WITHOUT RAINFALL MAP

CONSECUTIVE DAYS WITH LESS THAN 0.25" RAINFALL

[Consecutive Days with Less Than 0.25 inches Rainfall | Mesonet]

PERCENTAGE OF SURFACE WATER CONSERVATION CAPACITY IN CENTRAL OK RESERVOIRS

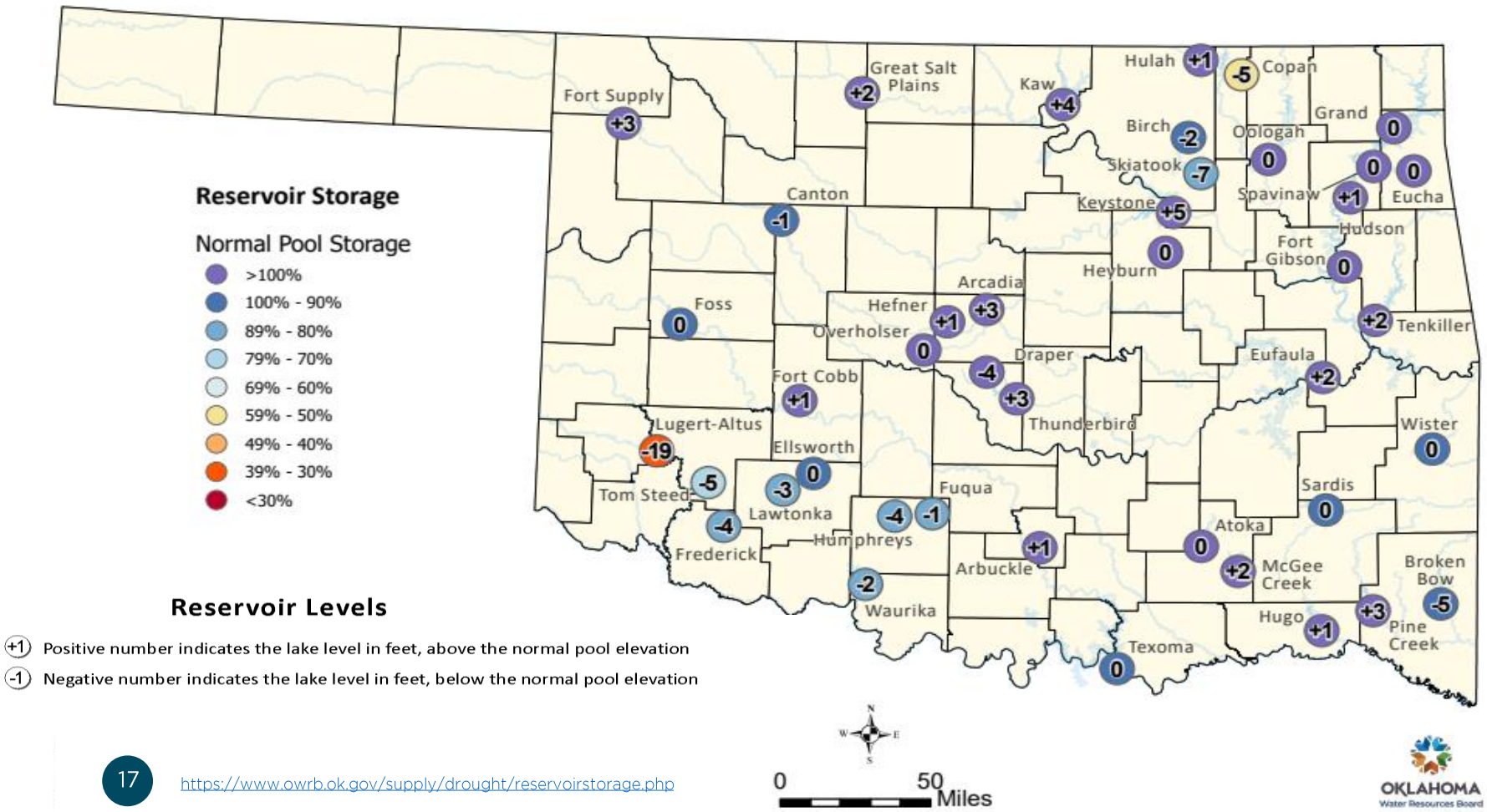


LAKE	% CAPACITY	% CHANGE FROM 6/29/2023
Canton	98.0	24.3
Arcadia	100.0	0.0
Lake Thunderbird	100.0	0.0
McGee Creek	100.0	0.0
Lake Atoka	100.0	0.0
TOTAL % CAPACITY	99.6	5.1

https://www.swt-wc.usace.army.mil/Daily_Morning_Reservoir_Report.pdf

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



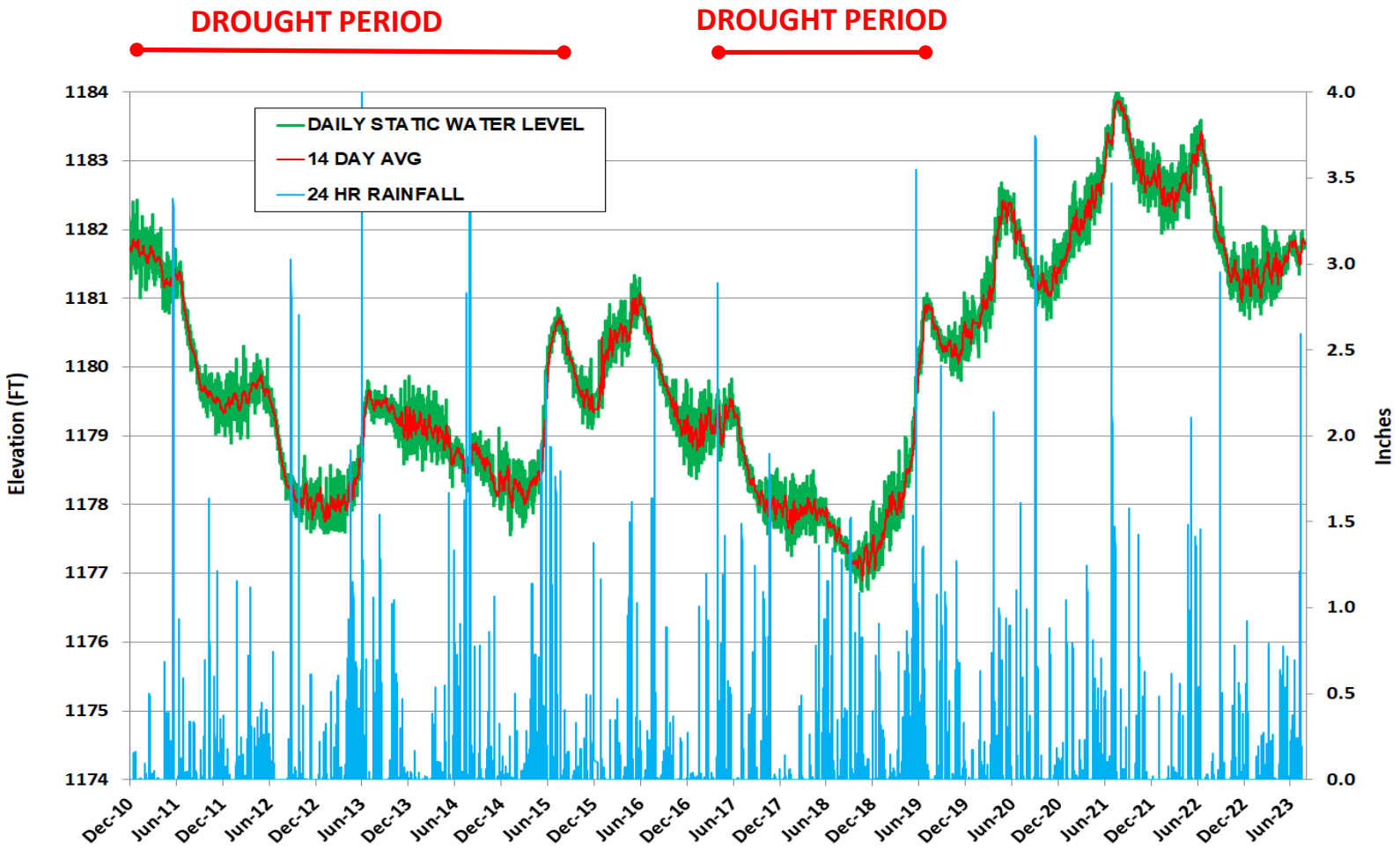
OKLAHOMA RESERVOIR LEVELS AND STORAGE AS OF 07/23/2023

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), and the U.S. Geological Survey (USGS Current Conditions for USGS 07333010 Atoka Reservoir near Stringtown, OK). For more information, please visit the OWRB's website: (https://www.owrb.ok.gov).

OKLAHOMA Water Resources Board

https://www.owrb.ok.gov/supply/drought/reservoirstorage.php

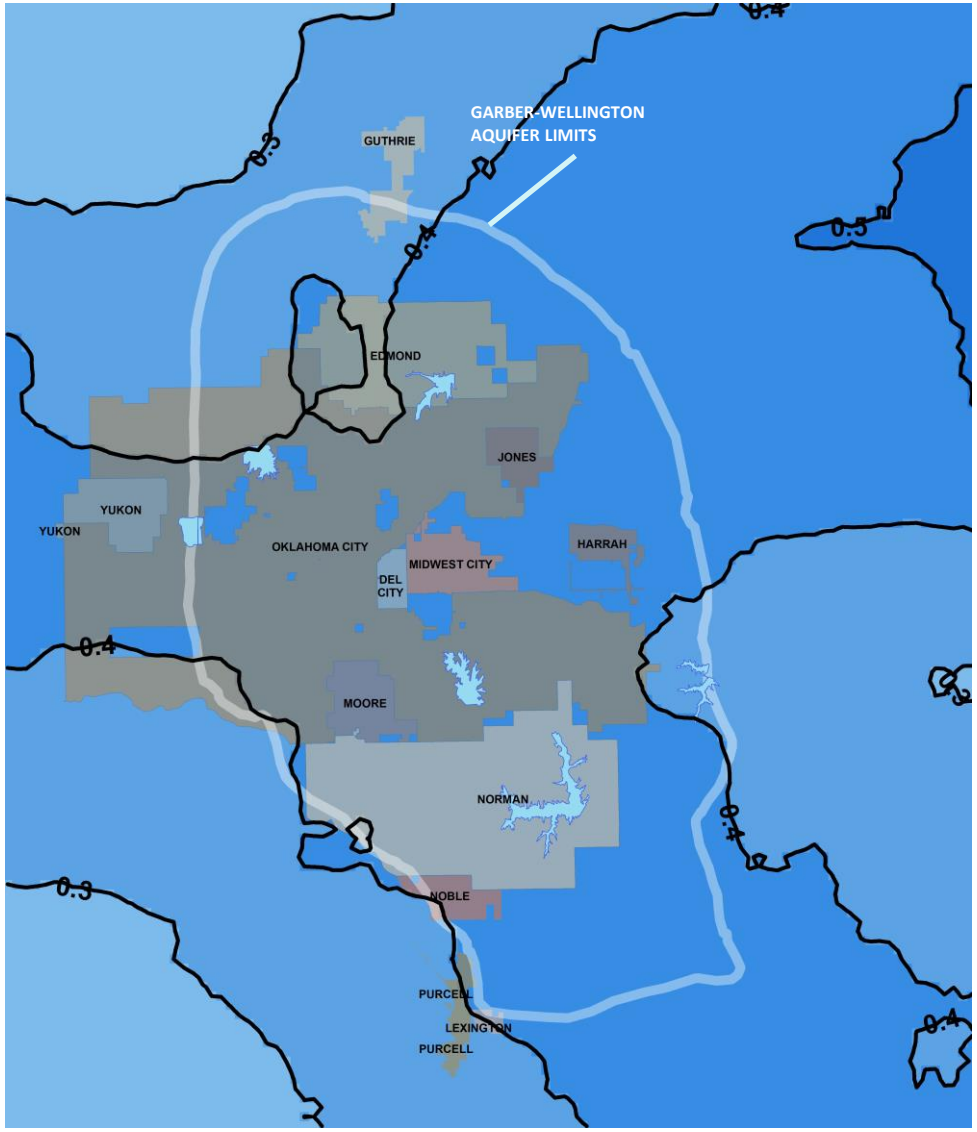
GROUNDWATER LEVELS SPENCER MESONET STATION

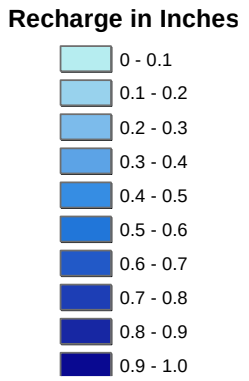


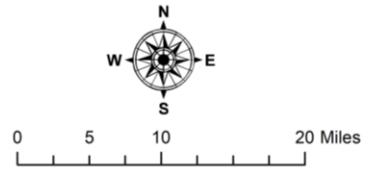
http://xwww.mesonet.org/index.php/weather/groundwater/

AQUIFER RECHARGE – Jul 2023

- Mean aquifer recharge in July 2023 was 0.39 inches.
- Normal recharge for July is 0.14 inches.
- The 2023 cumulative yearly average is 0.92 inches less than normal at this time.

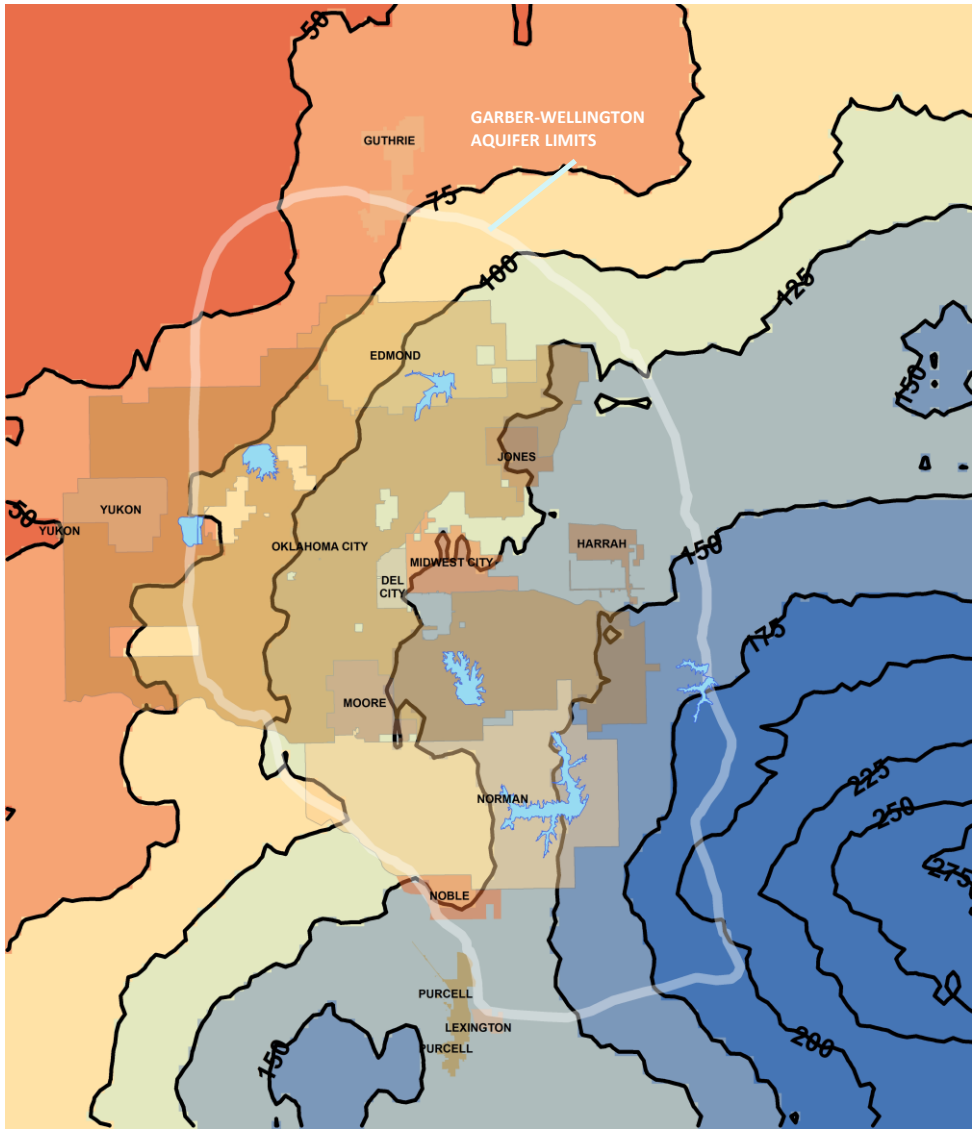






PERCENT TOTAL CUMULATIVE AQUIFER RECHARGE – Jan-Jul 2023

- Most of the recharge for 2023 so far this year is south and east of Shawnee.
- Recharge for the central Oklahoma metro area improved during July.
- Normal cumulative recharge for Jan-Jul 2023 is 1.95 inches.



Percent of Cumulative Recharge

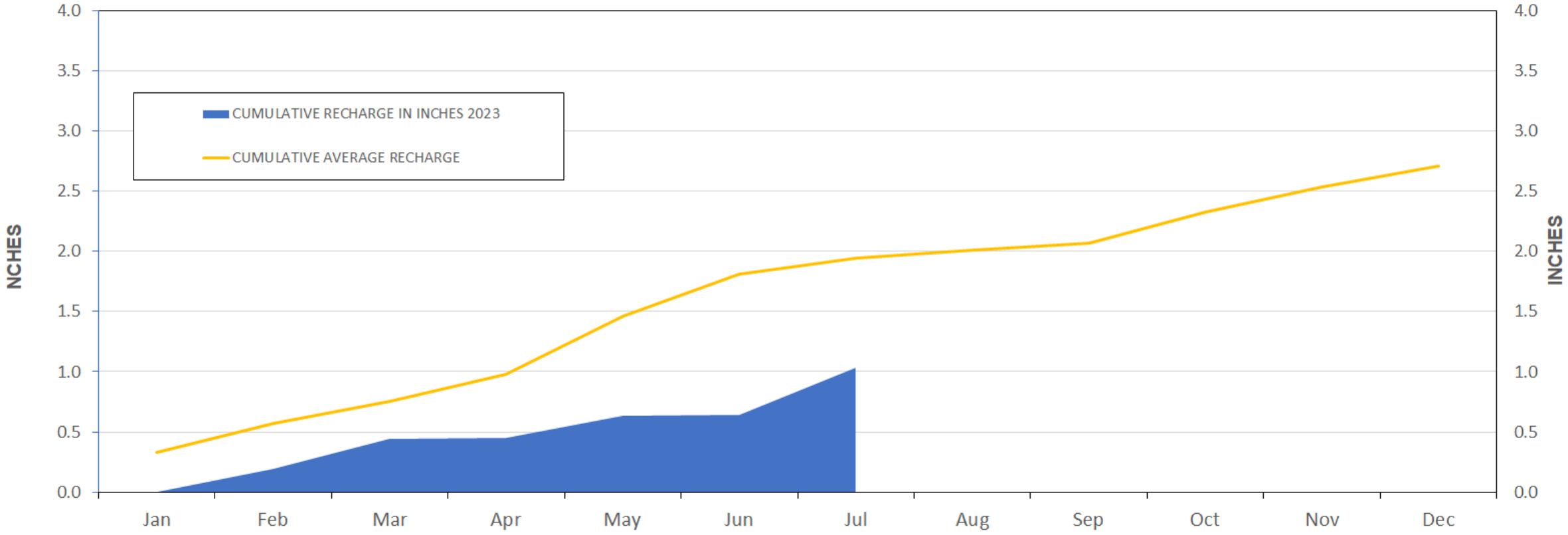
- 0 - 25
- 25 - 50
- 50 - 75
- 75 - 100
- 100 - 125
- 125 - 150
- 150 - 175
- 175 - 200

N W E S

0 5 10 20 Miles

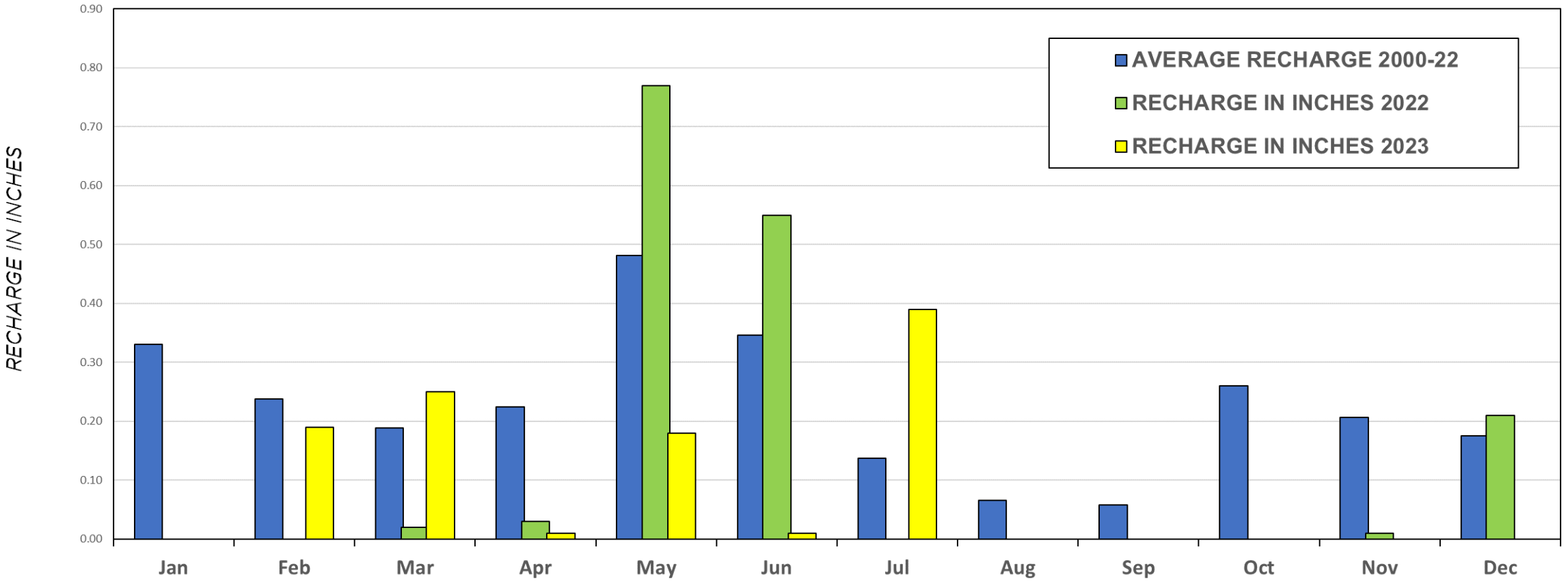
RECHARGE CHARTS CENTRAL OKLAHOMA AQUIFER SYSTEM

ACCUMULATED CENTRAL OKLAHOMA AQUIFER SYSTEM RECHARGE 2023

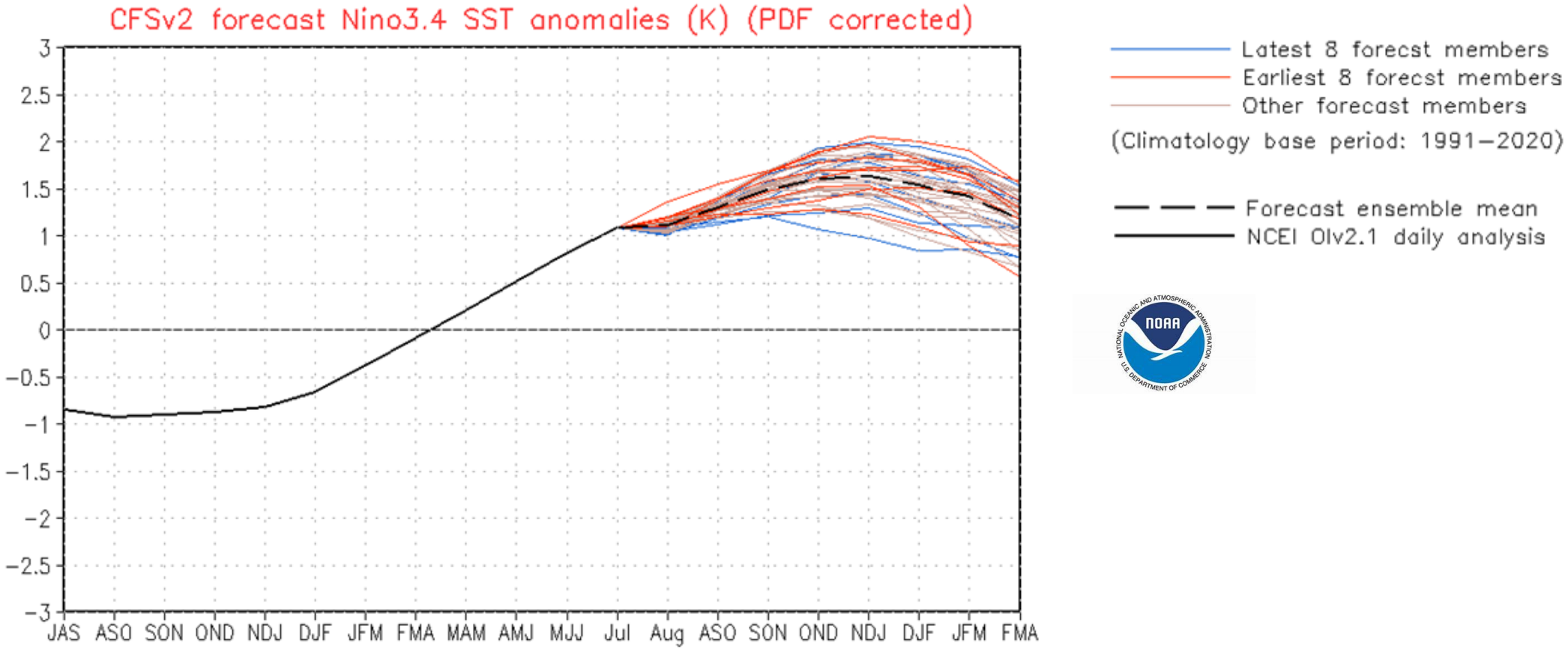


RECHARGE CHARTS CENTRAL OKLAHOMA AQUIFER SYSTEM CONTINUED

MONTHLY AQUIFER RECHARGE 2023

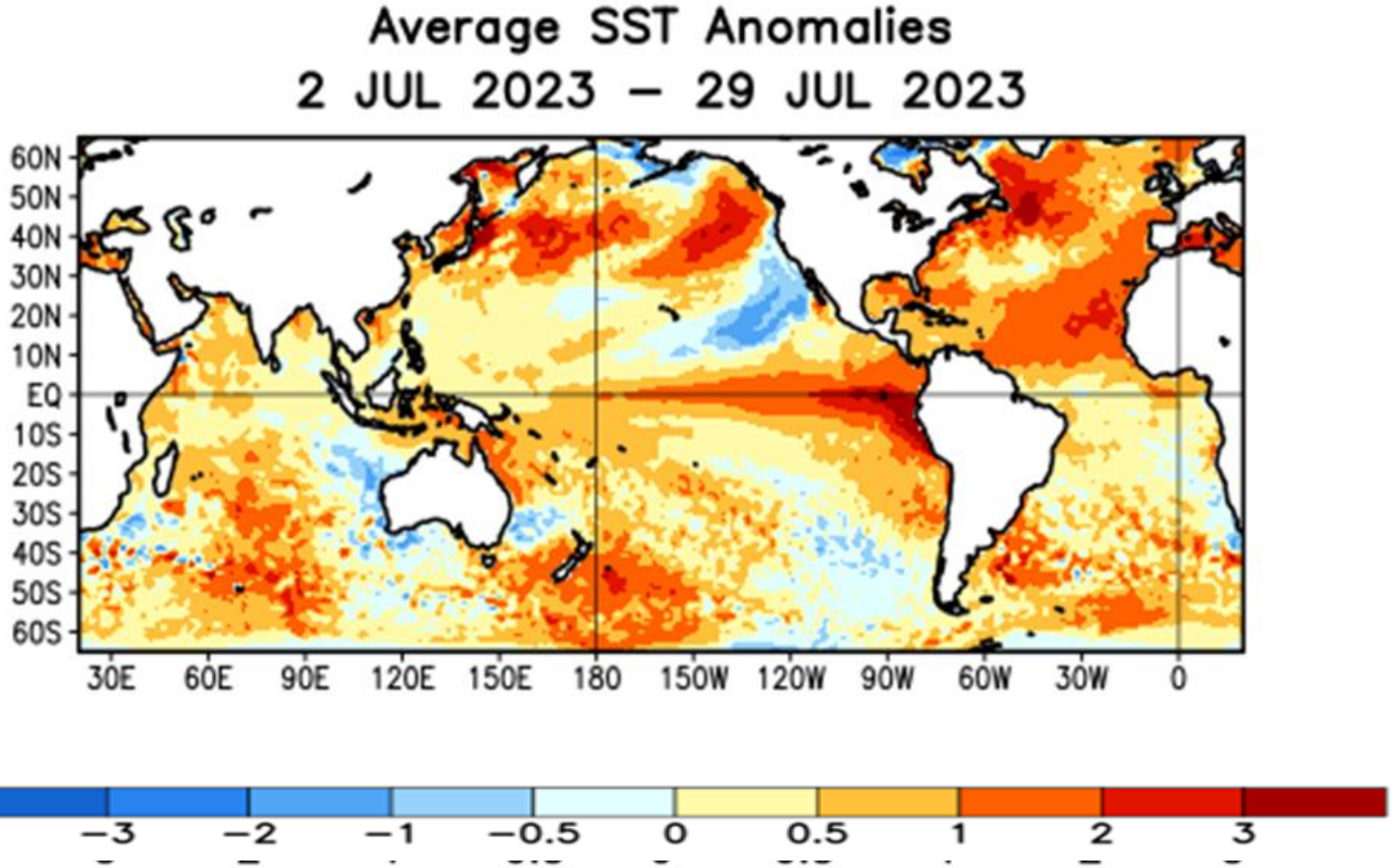


ENSO CYCLE - RECENT EVOLUTION, CURRENT STATUS AND PREDICTIONS



https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.ppt

ENSO CYCLE - RECENT EVOLUTION, CURRENT STATUS AND PREDICTIONS



https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.ppt

SUMMARY

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.
- There is a greater than 90% chance that El Niño will continue through the Northern Hemisphere winter.

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.ppt

QUESTIONS?

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ASSOCIATION OF
CENTRAL OKLAHOMA
GOVERNMENTS