



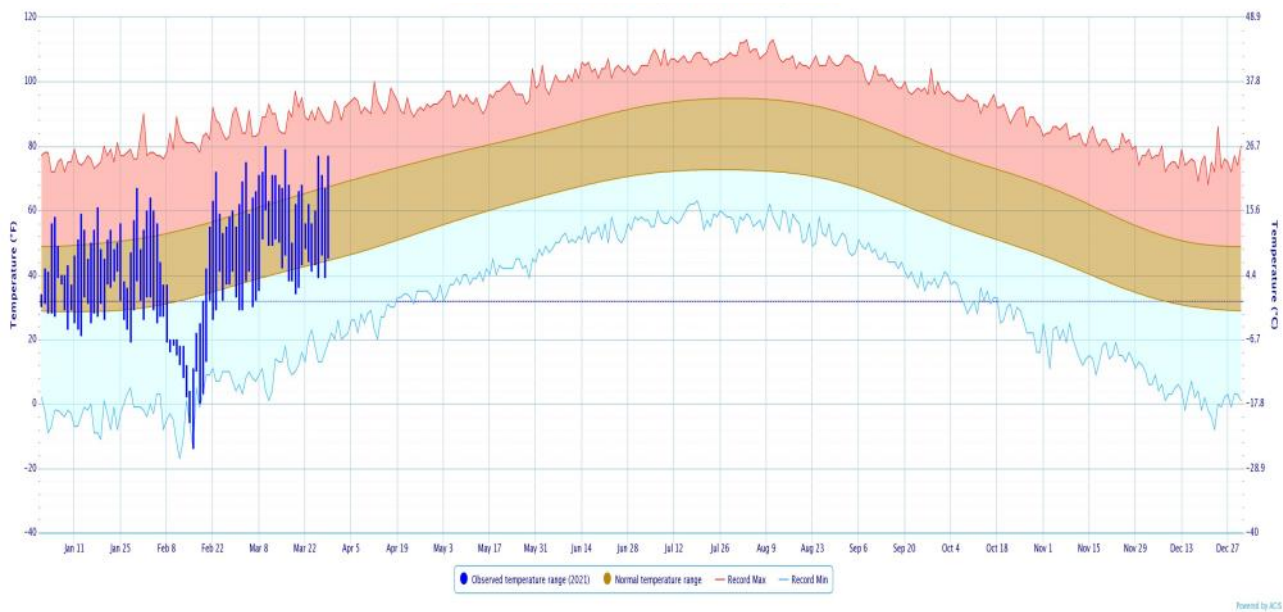
# **Drought Conditions in Central Oklahoma**

**Water Resources Division  
Association of Central Oklahoma Governments  
April 1, 2021**



# Temperature and Precipitation Plot for Oklahoma City, Oklahoma for 2021

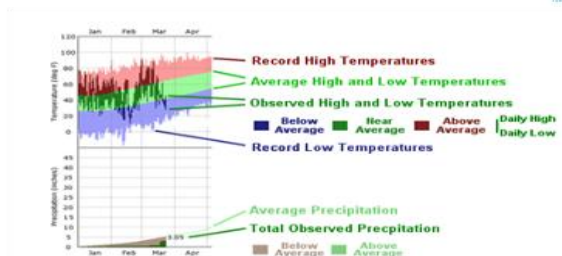
## Daily Temperature Data – Oklahoma City Area, OK



## Accumulated Precipitation—Oklahoma City Area, OK



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



# Rainfall Summaries by Oklahoma Climate Division

Calendar Year 01-Jan-2021 through 31-Mar-2021

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	5.64"	+1.28"	129%	16th wettest	0.40" (1972)	9.66" (1973)
Central	5.05"	-1.34"	79%	47th driest	0.93" (1936)	13.98" (1990)
S. Central	4.57"	-3.21"	59%	24th driest	1.68" (1972)	16.52" (1990)
Statewide	5.61"	-0.81"	87%	51st wettest	1.36" (1936)	12.62" (1990)

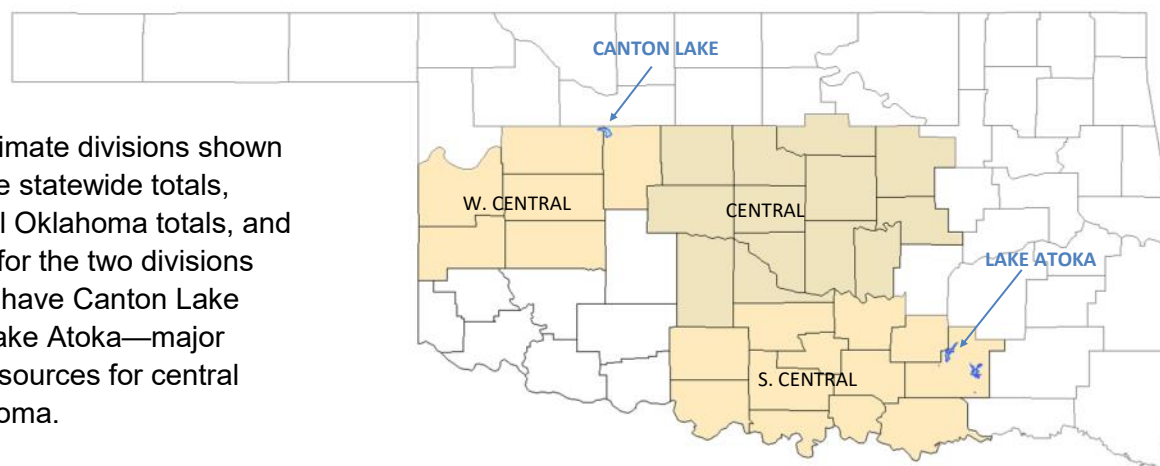
Water Year: 01-Oct-2020 through 31-Mar-2021

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	10.45"	+0.55"	106%	31st wettest	2.30" (1966-67)	18.54" (1986-87)
Central	13.16"	-1.34"	91%	40th wettest	4.60" (1966-67)	28.06" (1984-85)
S. Central	10.72"	-6.75"	61%	18th driest	5.24" (1966-67)	28.93" (1984-85)
Statewide	12.94"	-1.56"	89%	46th wettest	4.84" (1966-67)	23.79" (1984-85)

Spring 01-Mar through 31-Mar-2021

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	3.82"	+1.53"	167%	8th wettest	0.00" (1971)	6.94" (1973)
Central	2.41"	-0.75"	76%	50th wettest	0.10" (1971)	7.76" (1990)
S. Central	2.15"	-1.29"	62%	34th driest	0.22" (1950)	8.25" (1945)
Statewide	3.07"	+0.04"	101%	31st wettest	0.40" (1971)	7.45" (1973)

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.

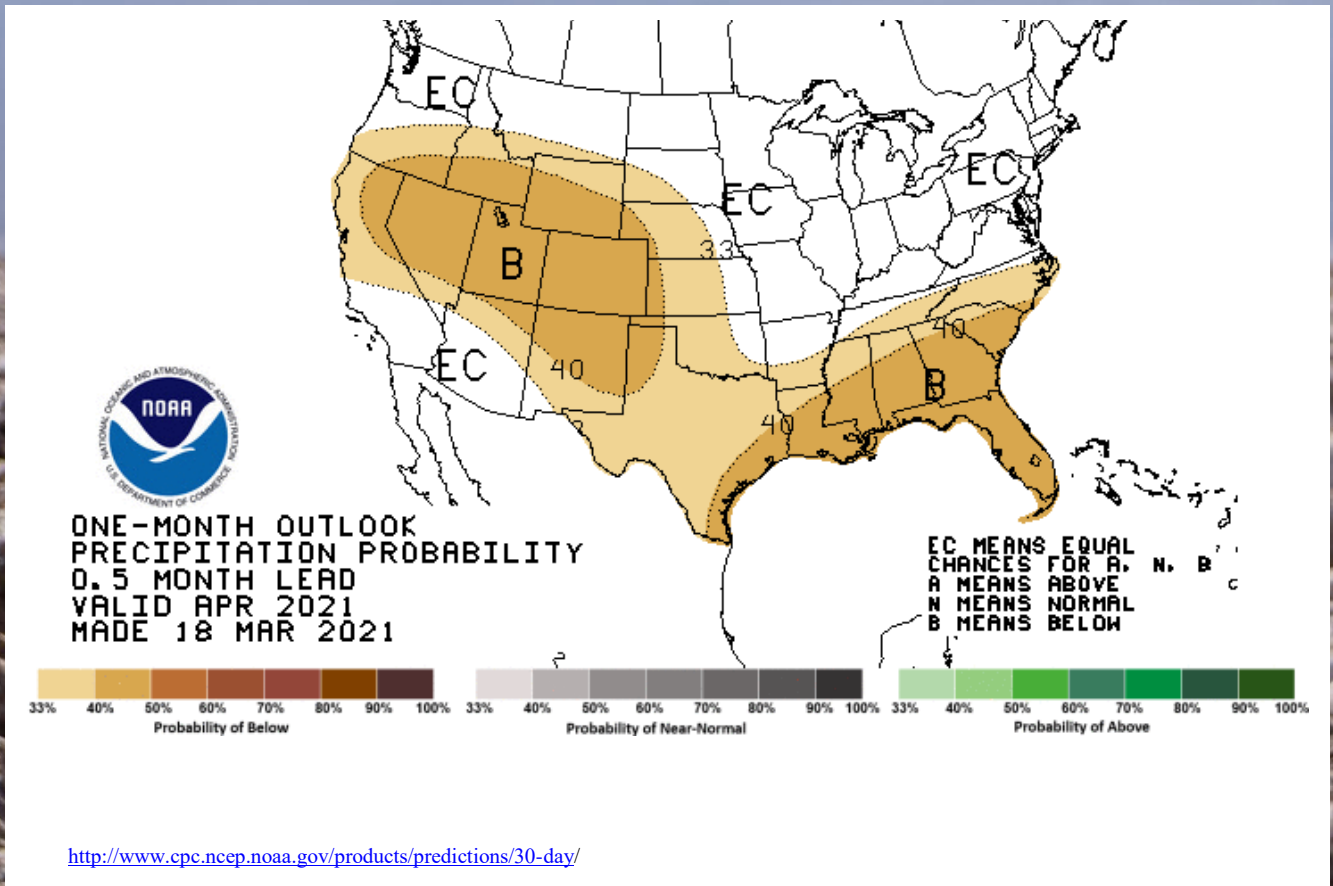


[http://climate.ok.gov/index.php/drought/last\\_30\\_days/](http://climate.ok.gov/index.php/drought/last_30_days/)

OKLAHOMA  
CLIMATOLOGICAL SURVEY



# NOAA One-Month Outlook

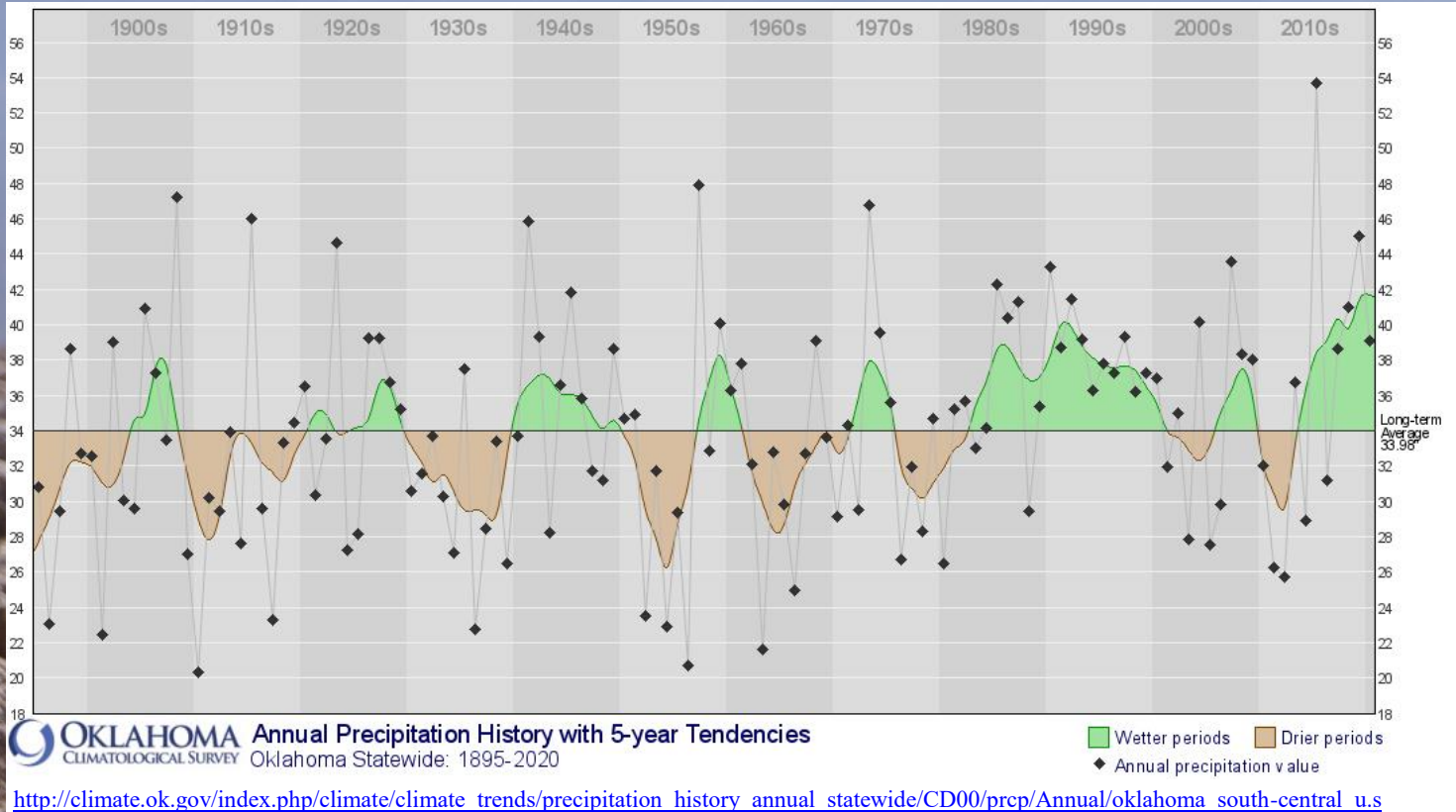


White areas are shown as EC (Equal Chance) on these maps represent areas where there are no strong climate signals from the climate tools to have skill in preferring one category over another.

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.



# Annual Precipitation History with 5-Year Tendencies



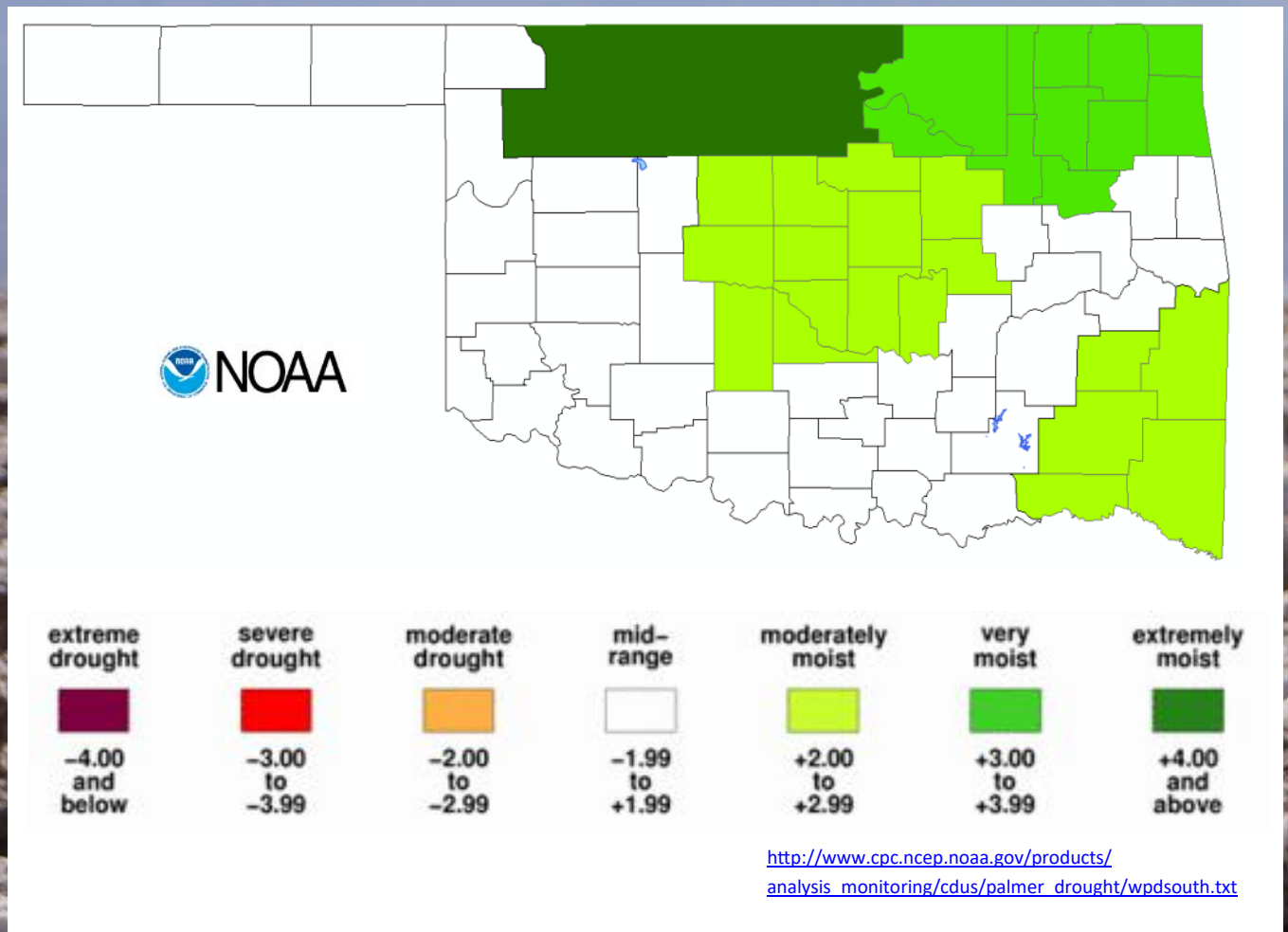
This graph shows the cyclical nature of wet and drought periods in Oklahoma. The black dots represent the annual precipitation for that particular year. The line represents the annual precipitation data smoothed over five years.

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 Ending 27 MAR 2021



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 (meteorological) moisture conditions has changed over the last 12 months.

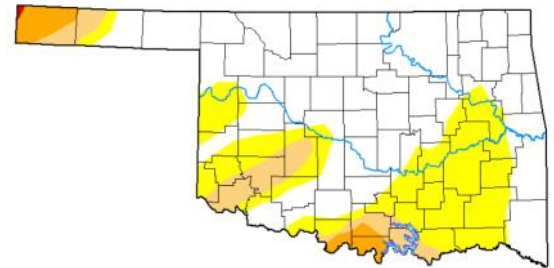
On these maps, the red shading denotes drought conditions while the green shading indicates wet conditions.

# U.S. Drought Monitor

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	<a href="#">2021-03-30</a>	63.05	36.95	10.71	3.42	0.08	0.00
Last Week	<a href="#">2021-03-23</a>	63.26	36.74	11.54	3.42	0.08	0.00
3 Months Ago	<a href="#">2020-12-29</a>	56.83	43.17	25.21	7.75	1.45	0.00
Start of Calendar Year	<a href="#">2020-12-29</a>	56.83	43.17	25.21	7.75	1.45	0.00
Start of Water Year	<a href="#">2020-09-29</a>	66.79	33.21	17.71	11.97	1.55	0.00
One Year Ago	<a href="#">2020-03-31</a>	95.89	4.11	2.52	0.84	0.00	0.00

## U.S. Drought Monitor Oklahoma

Abnormal dryness or drought are currently affecting approximately 152,928 people in Oklahoma.



### Intensity:

■ D0 - Abnormally Dry  
■ D1 - Moderate Drought  
■ D2 - Severe Drought

■ D3 - Extreme Drought  
■ D4 - Exceptional Drought



**Drought.gov**  
U.S. Drought Portal

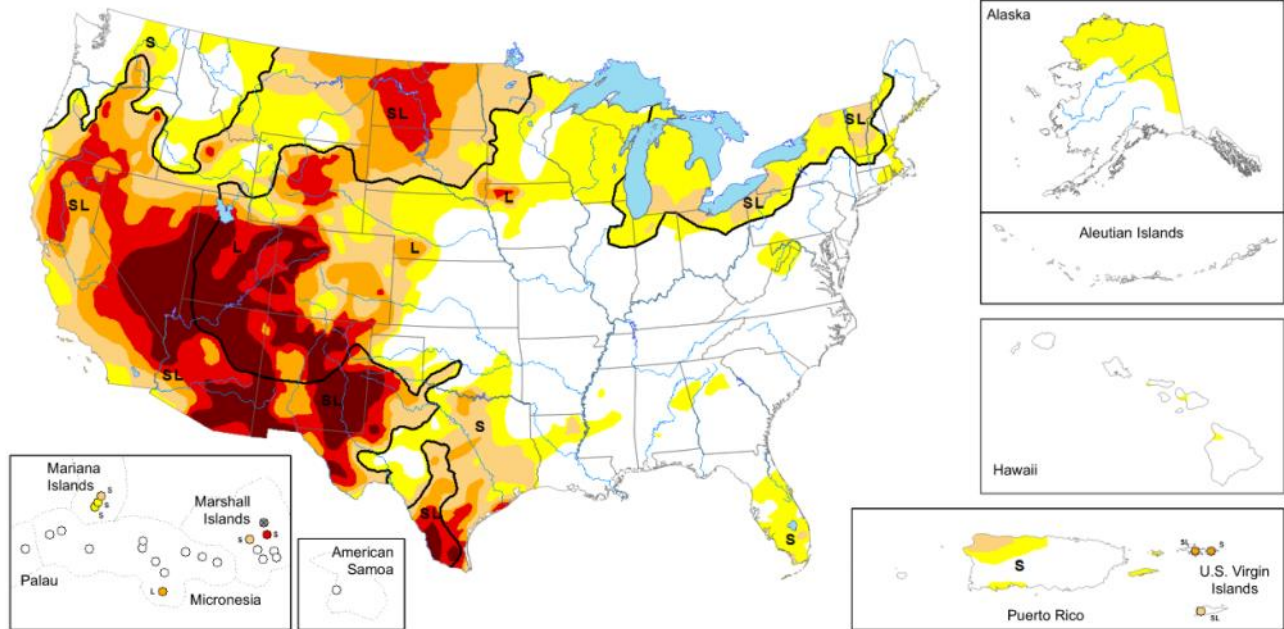
<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OK>



# U.S. Drought Monitor Nationwide Map

Map released: April 1, 2021

Data valid: March 30, 2021



United States and Puerto Rico Author(s):

Brad Pugh, NOAA/CPC

U.S. Affiliated Pacific Islands and Virgin Islands Author(s):

Richard Heim, NOAA/NCEI

<http://droughtmonitor.unl.edu>

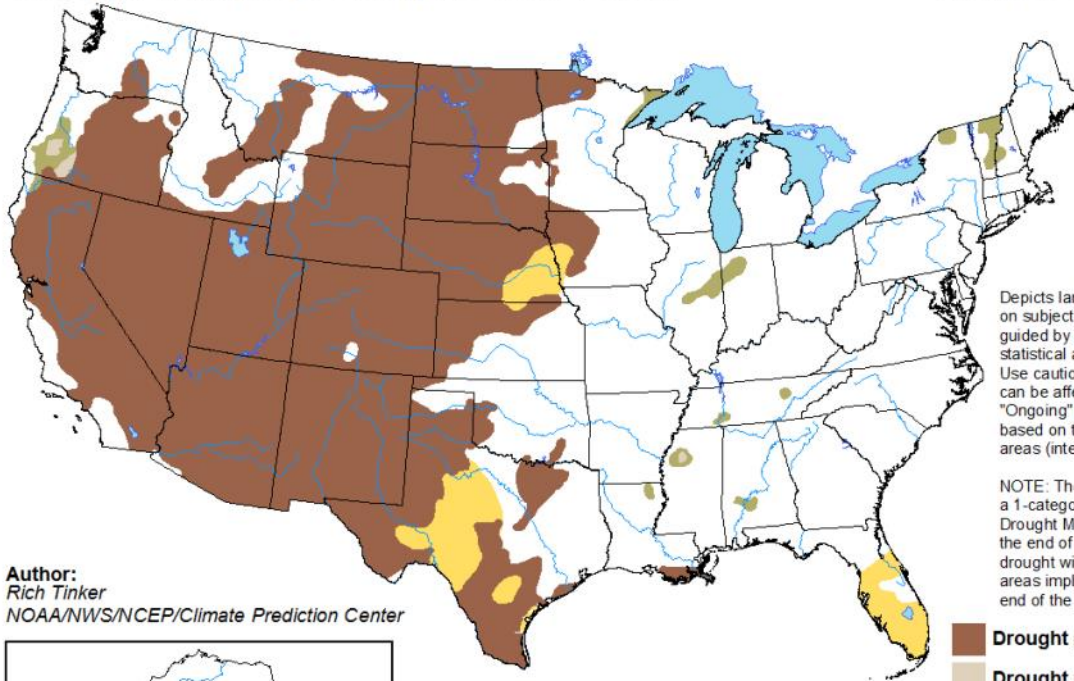


# U.S. Drought Monitor

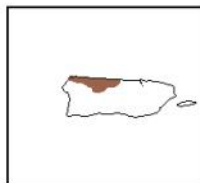
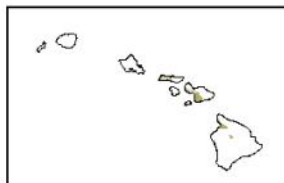
## Monthly Drought Outlook Map

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

Valid for March 2021  
Released February 28, 2021



Author:  
Rich Tinker  
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).

- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely



<http://go.usa.gov/3eZGd>

[http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/mdo\\_summary.php](http://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php)

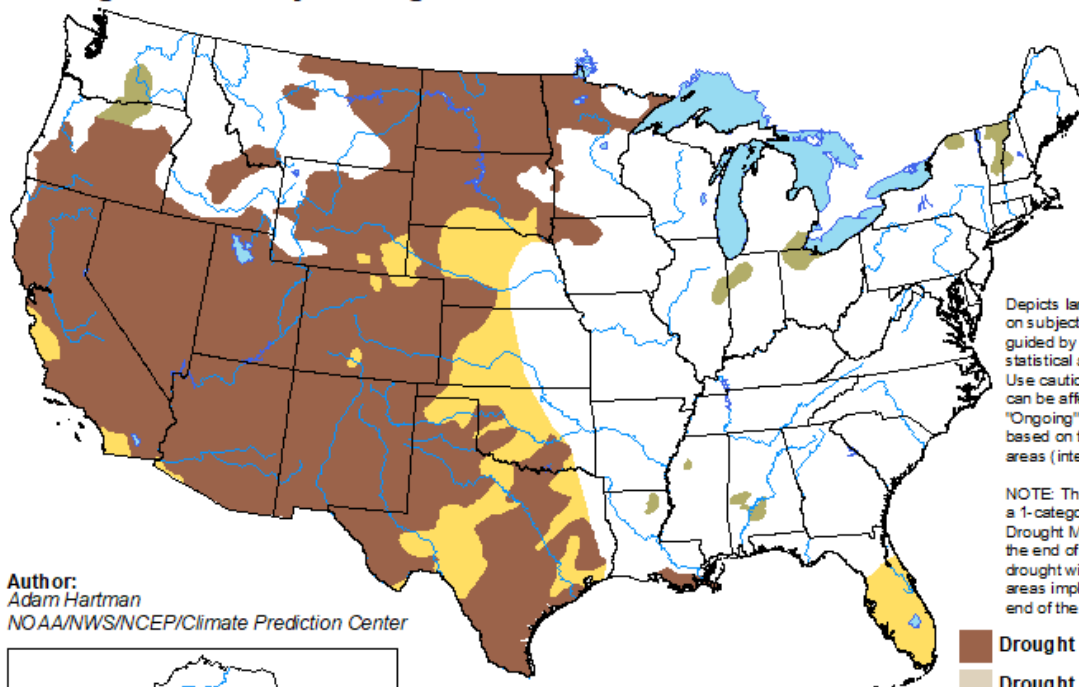


# U.S. Drought Monitor

## Seasonal Drought Outlook Map

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

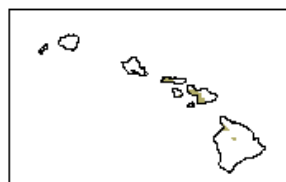
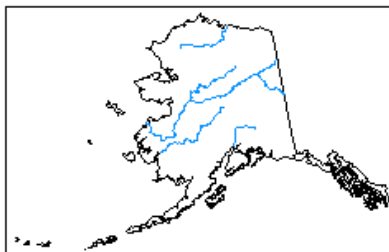
Valid for March 18 - June 30, 2021  
Released March 18



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).

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



- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely



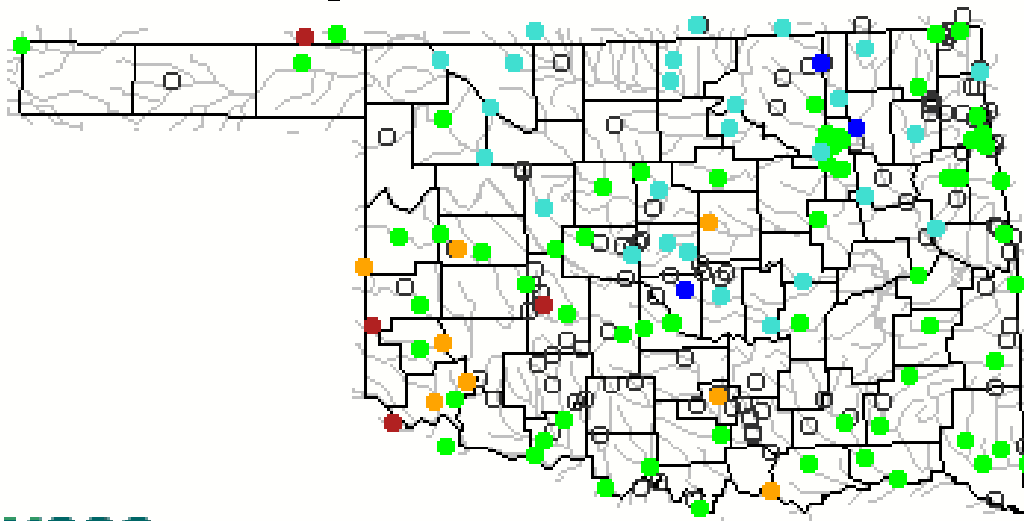
<http://go.usa.gov/3e273>

[http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/sdo\\_summary.php](http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php)



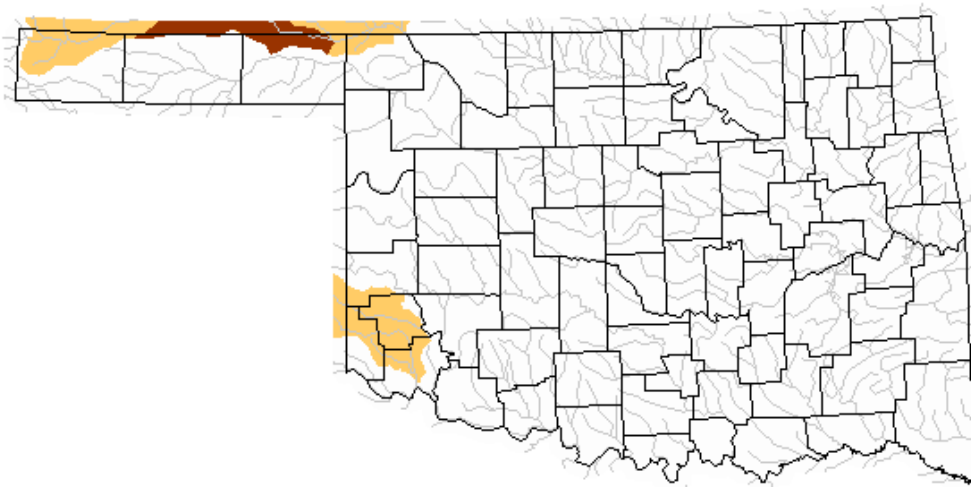
# USGS Streamflow Data

Tuesday, March 30, 2021 15:30ET



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: gray;">○</span>
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Monday, March 29, 2021



**Below normal 28-day average streamflow**

Explanation - Percentile classes				
<span style="background-color: red; width: 20px; height: 10px;"></span>	<span style="background-color: brown; width: 20px; height: 10px;"></span>	<span style="background-color: orange; width: 20px; height: 10px;"></span>	<span style="background-color: yellow; width: 20px; height: 10px;"></span>	<span style="background-color: gray; width: 20px; height: 10px;"></span>
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\\_map|m\\_pa28d\\_dwc&r=ok](https://waterwatch.usgs.gov/index.php?id=pa28d_dry&sid=w_map|m_pa28d_dwc&r=ok)



# SOIL MOISTURE MAP

**Mesonet**

**1-day Average 24-inch Fractional Water Index**

March 29, 2021

Created 7:30:14 AM March 30, 2021 CDT. © Copyright 2021

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



March 29, 2021

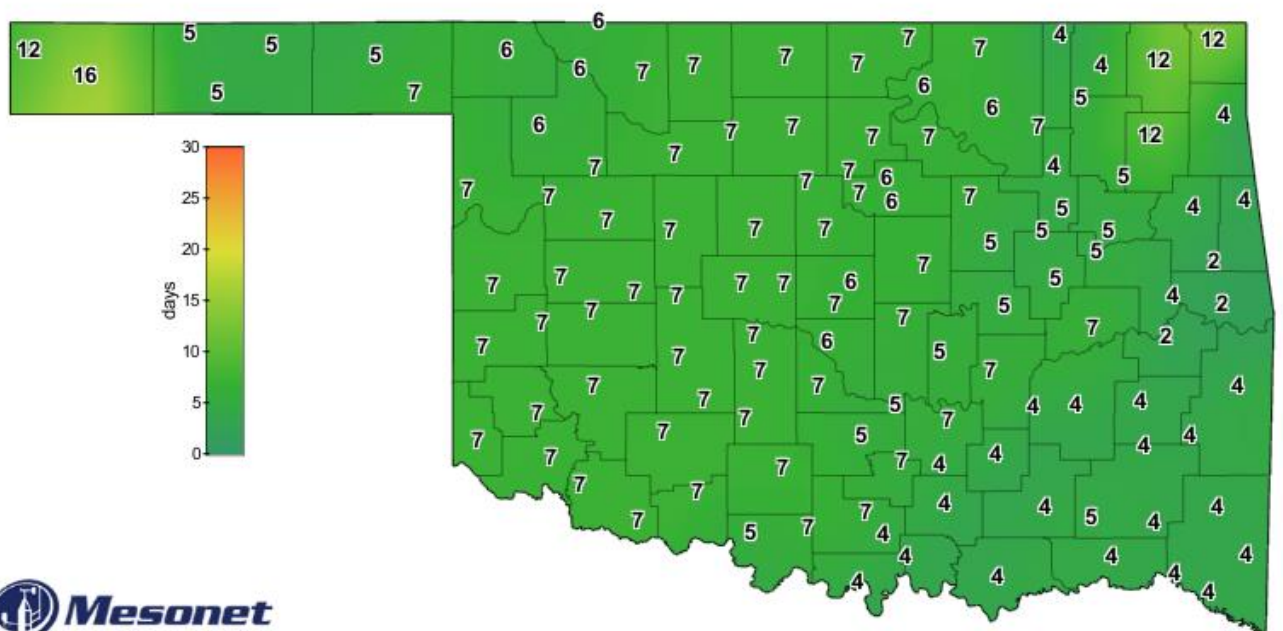
Created 7:30:14 AM March 30, 2021 CDT. © Copyright 2021



[http://www.mesonet.org/index.php/weather/map/24-inch fractional water index/soil moisture](http://www.mesonet.org/index.php/weather/map/24-inch%20fractional%20water%20index/soil%20moisture)



# CONSECUTIVE DAYS WITHOUT RAINFALL MAP



Consecutive Days With Less Than 0.25" Rainfall

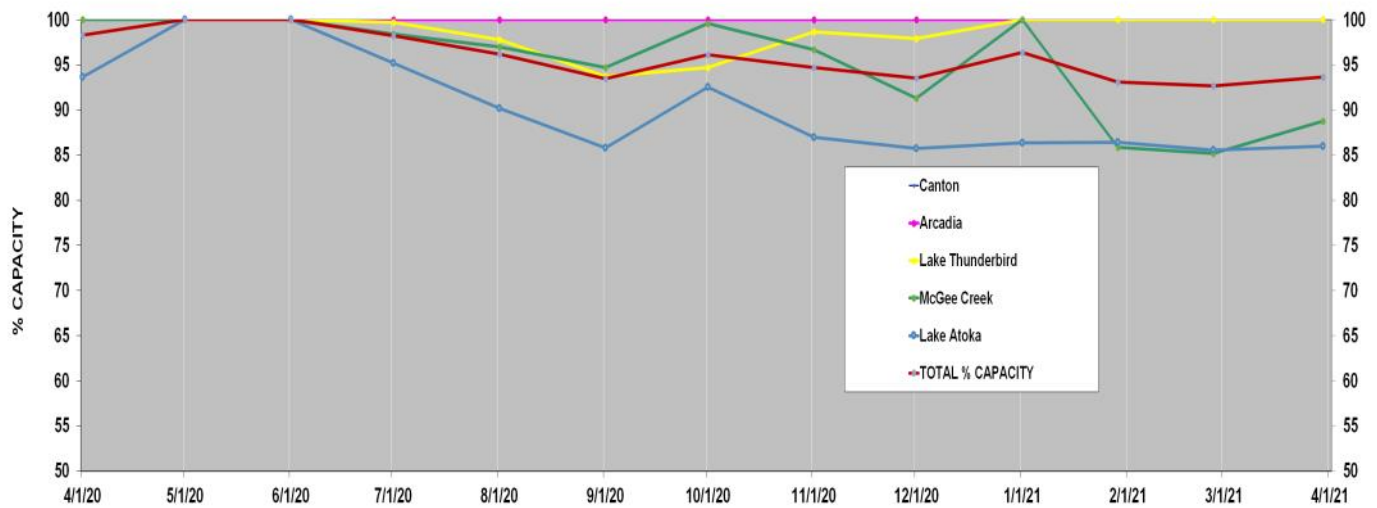
March 29, 2021

Created 8:15:01 AM March 30, 2021 CDT. © Copyright 2021

[http://www.mesonet.org/index.php/weather/map/consecutive\\_days\\_with\\_less\\_than\\_0.25\\_inches\\_Rainfall/rainfall](http://www.mesonet.org/index.php/weather/map/consecutive_days_with_less_than_0.25_inches_Rainfall/rainfall)



## Percent of Surface Water Conservation Storage Central OK Reservoirs



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

LAKE	% CAPACITY	% CHANGE FROM 2/26/2021
Canton	100.0	0.0
Arcadia	100.0	0.0
Lake Thunderbird	100.0	0.0
McGee Creek	88.8	3.6
Lake Atoka	86.4	0.4
TOTAL % CAPACITY	93.6	1.0

[http://www.swt-wc.usace.army.mil/Daily\\_Morning\\_Reservoir\\_Report.pdf](http://www.swt-wc.usace.army.mil/Daily_Morning_Reservoir_Report.pdf)

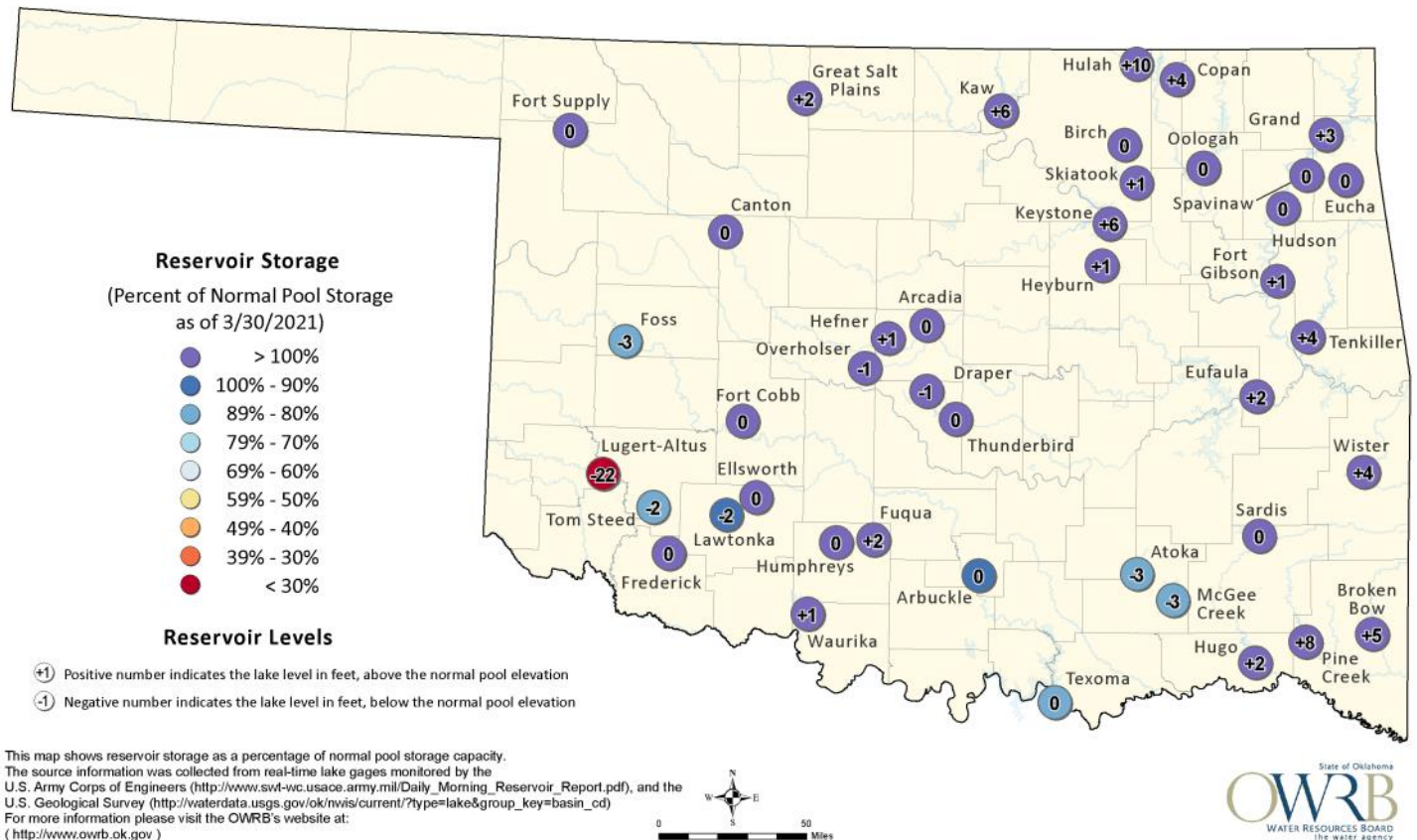
[http://waterdata.usgs.gov/ok/nwis/dv/?site\\_no=07333010&agency\\_cd=USGS&referred\\_module=sw](http://waterdata.usgs.gov/ok/nwis/dv/?site_no=07333010&agency_cd=USGS&referred_module=sw)

The graph is the amount of water stored in five major lakes that supply water to central Oklahoma as a percent of capacity over the past year.



# Oklahoma Surface Water Resources

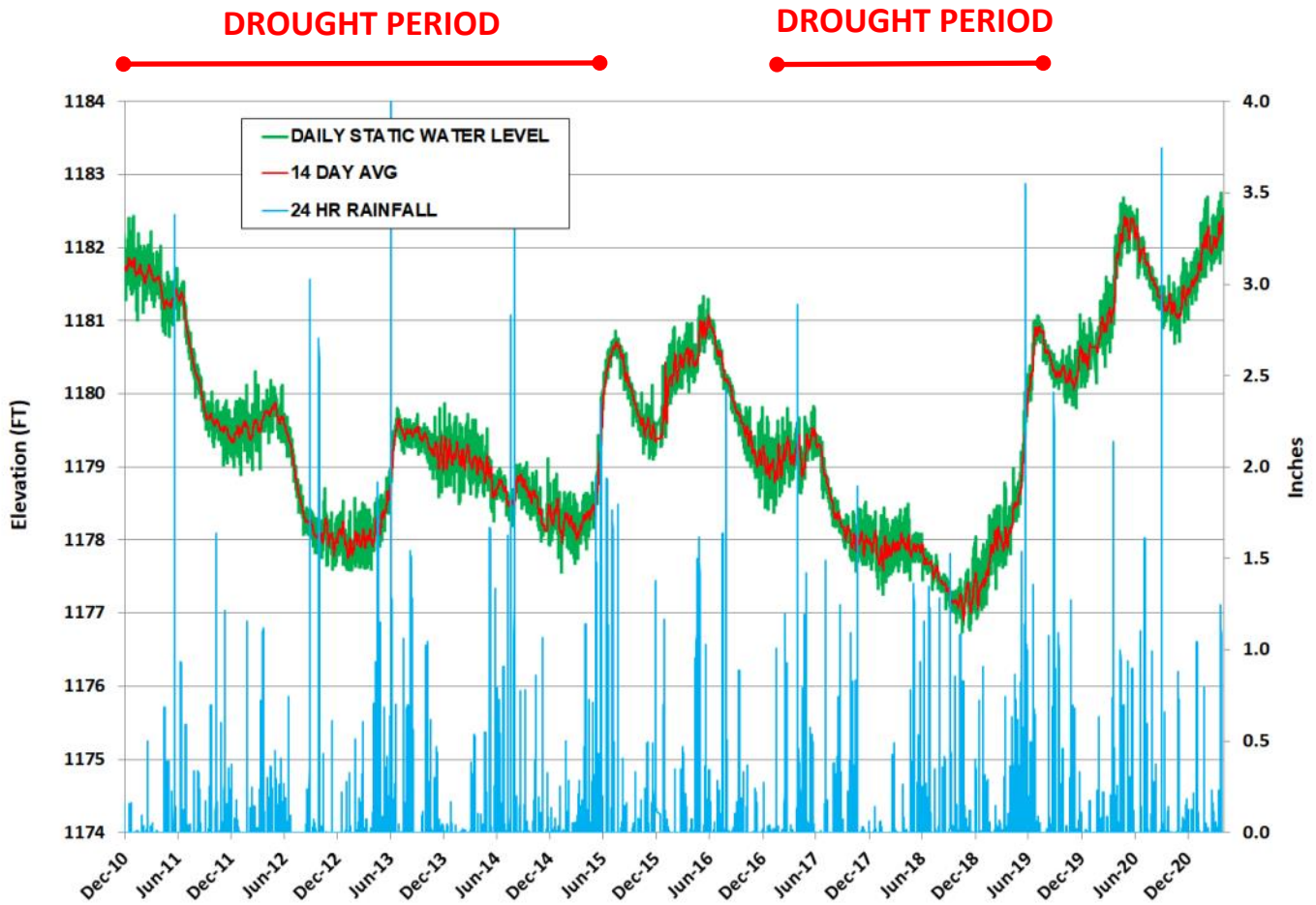
## Reservoir Levels and Storage as of 3/30/2021



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



# Groundwater Levels Spencer Mesonet Station



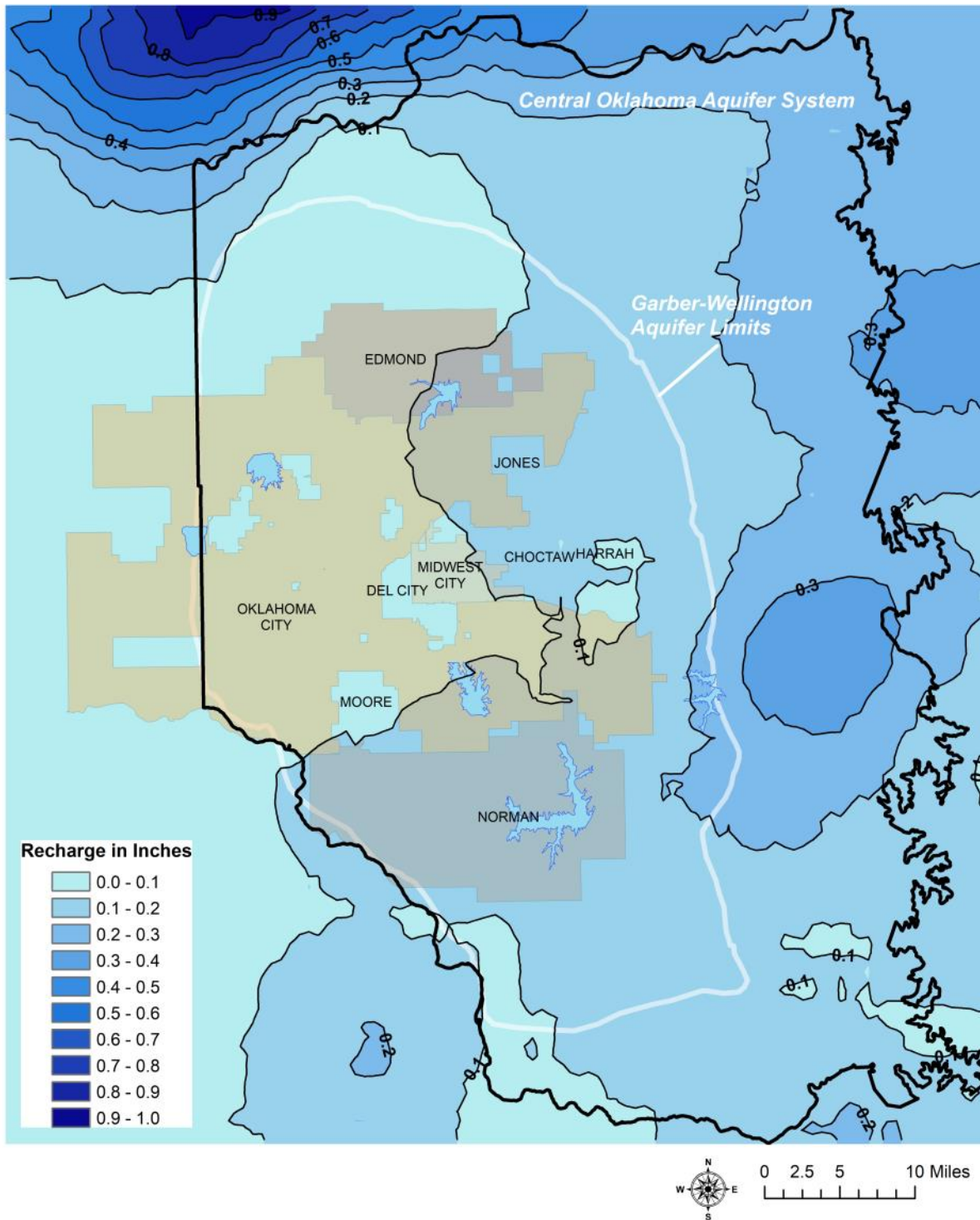
<http://www.mesonet.org/index.php/weather/groundwater>





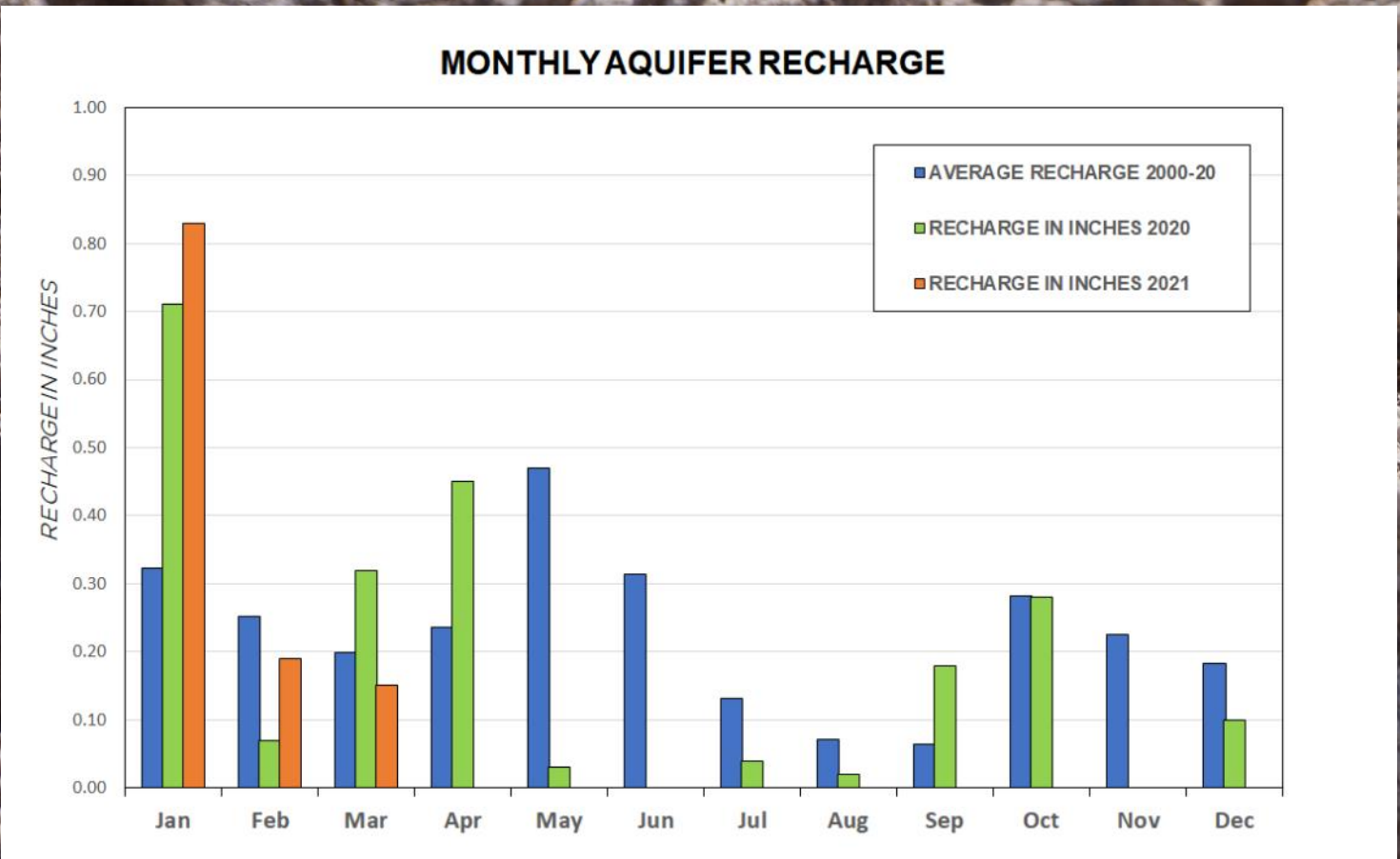
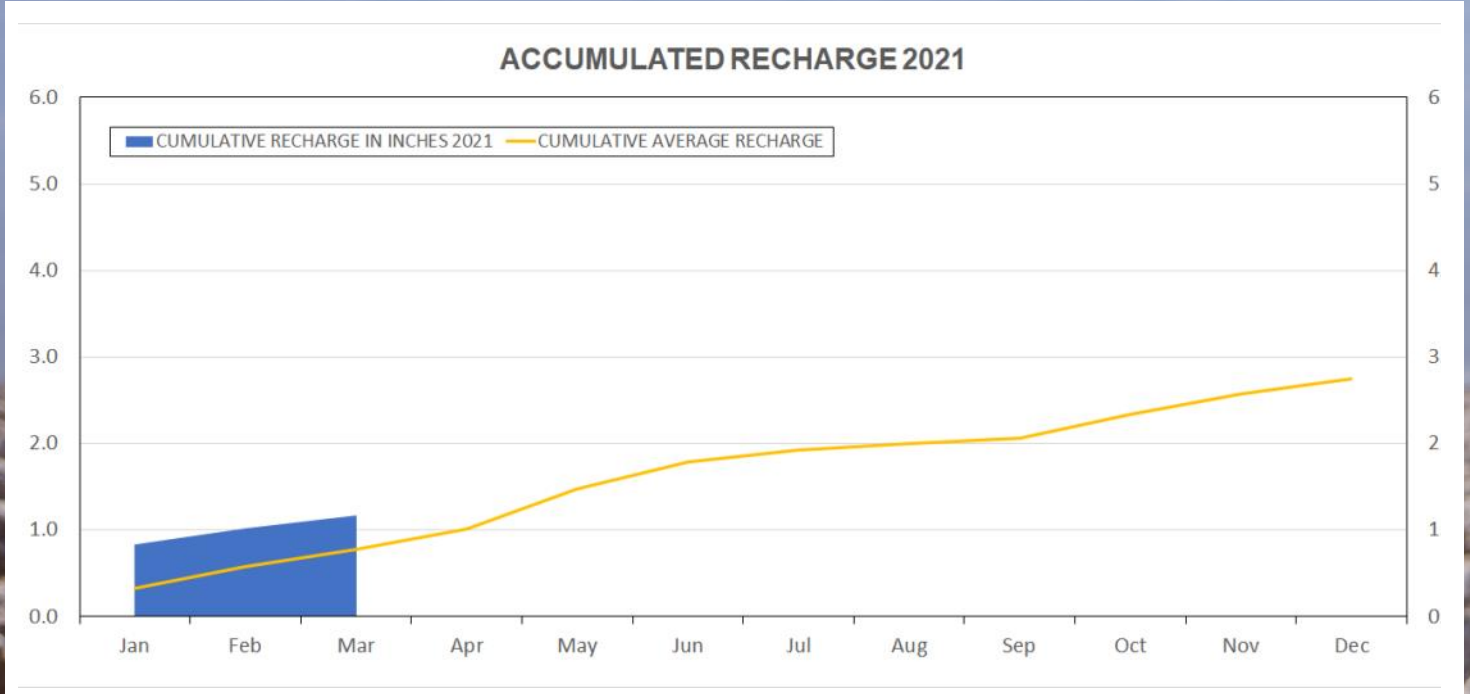
# Recharge Map Central Oklahoma Aquifer System

## AQUIFER RECHARGE MAR 2021



# Recharge Charts

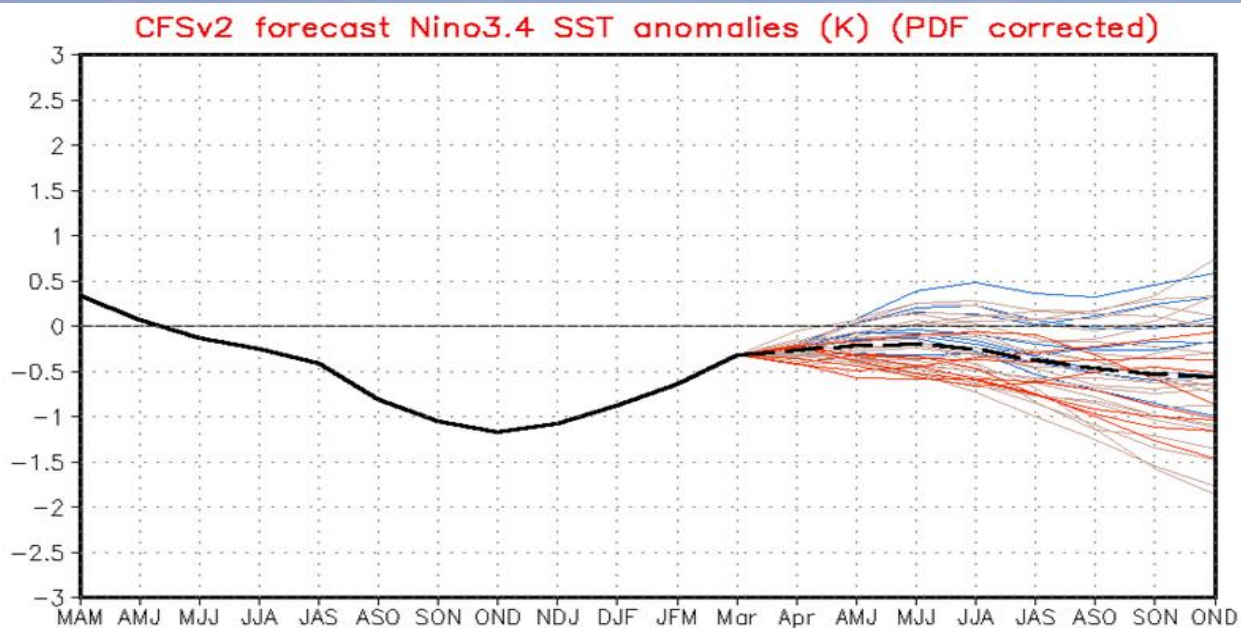
## Central Oklahoma Aquifer System



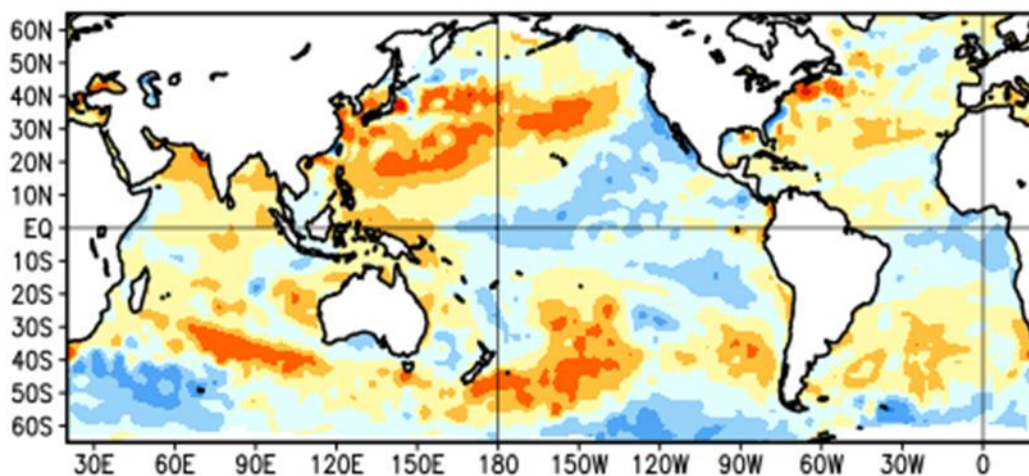


# ENSO Cycle

## Recent Evolution, Current Status and Predictions



### Average SST Anomalies 28 FEB 2021 – 27 MAR 2021



## Summary

ENSO Alert System Status: La Niña Advisory

- La Niña is present.
- Equatorial sea surface temperatures (SSTs) are below average from the west-central to eastern Pacific Ocean.
- The tropical atmospheric circulation is consistent with La Niña.
- There is a ~60% chance of a transition from La Niña to ENSO-Neutral during the Northern Hemisphere spring 2021 (April-June).\*

[https://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/lanina/enso\\_evolution-status-fcsts-web.ppt](https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.ppt)