# Drought Conditions
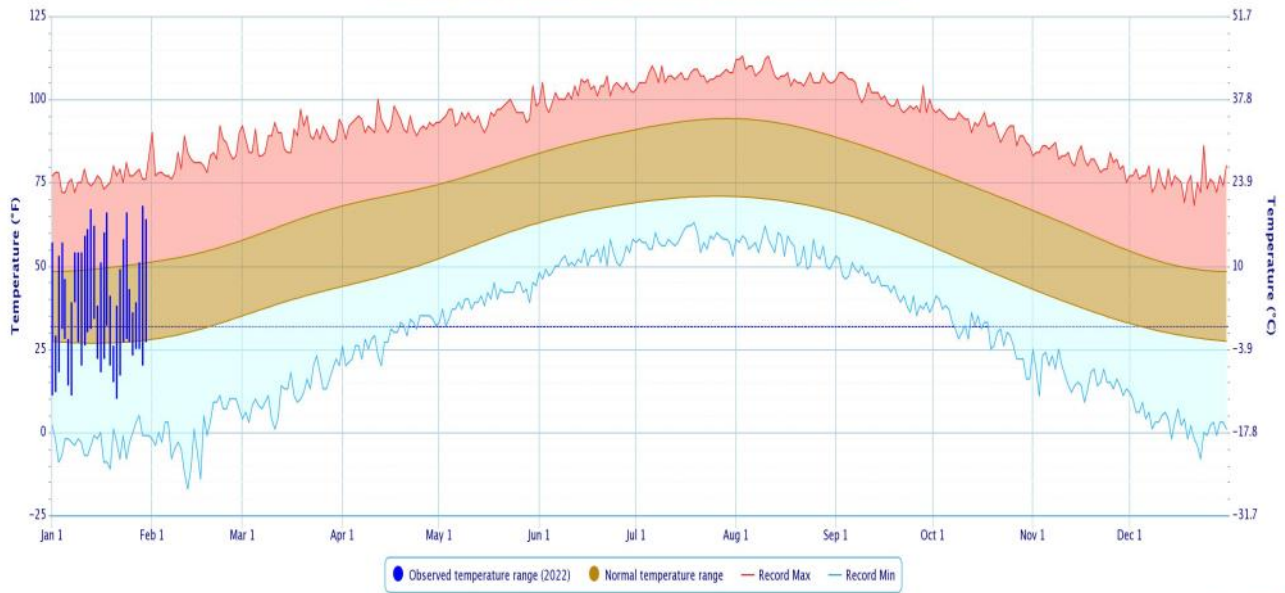# in
# Central Oklahoma

**Water Resources Division**
**Association of Central Oklahoma Governments**
**February 01, 2022**

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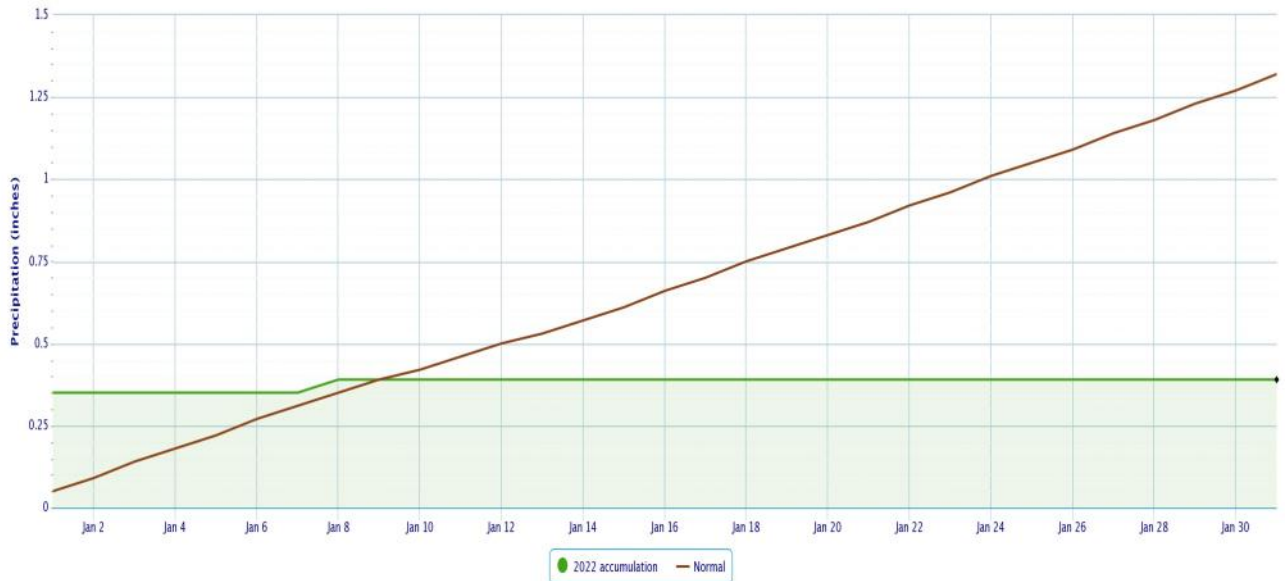# Temperature and Precipitation Plot for Oklahoma City, Oklahoma for 2022



Daily Temperature Data – Oklahoma City Area, OK



**Accumulated Precipitation—Oklahoma City Area, OK**

http://xmacis.rcc-acis.org/
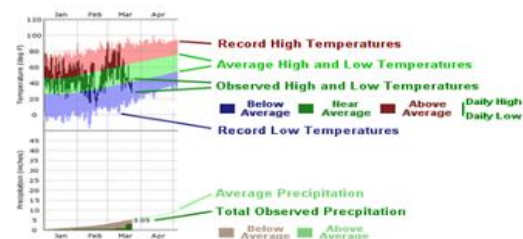
# Rainfall Summaries by Oklahoma Climate Division

Calendar Year 01-Jan-2021 though 30-Jan-2022

| Climate Division | Total Rainfall | Departure from Normal | Pct of Normal | Rank since 1921 (88 periods) | Driest on Record | Wettest on Record |
|---|---|---|---|---|---|---|
| W. Central | 0.26" | -0.65" | 29% | 28th driest | 0.00" (1986) | 3.92" (1949) |
| Central | 0.50" | -0.88" | 37% | 28th driest | 0.00" (1986) | 5.71" (1949) |
| S. Central | 0.52" | -1.43" | 27% | 18th driest | 0.02" (2003) | 6.86" (1932) |
| Statewide | 0.52" | -1.00" | 34% | 18th driest | 0.04" (1986) | 5.27" (1949) |

Water Year: 01-Oct-2021 through 30-Jan-2022

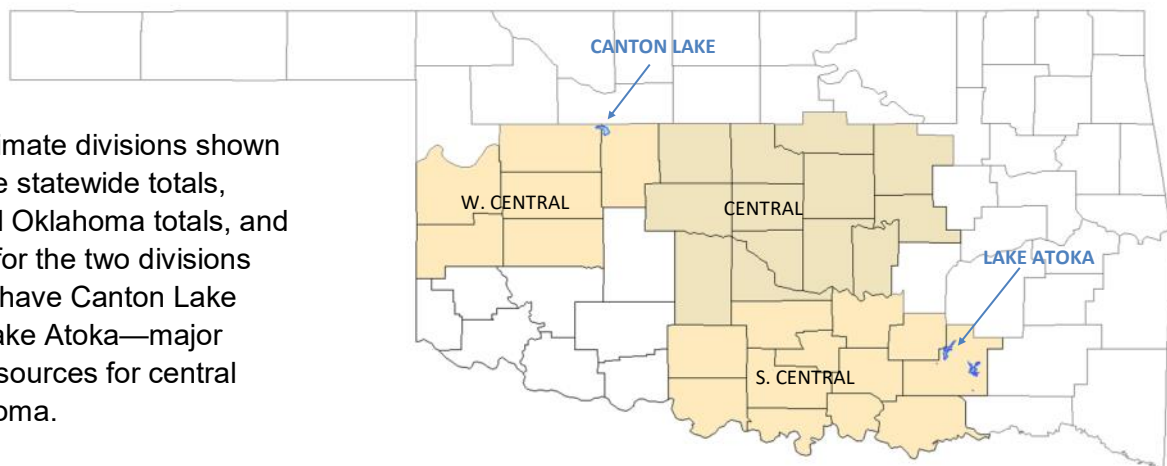| Climate Division | Total Rainfall | Departure from Normal | Pct of Normal | Rank since 1921 (88 periods) | Driest on Record | Wettest on Record |
|---|---|---|---|---|---|---|
| W. Central | 2.59" | -3.86" | 40% | 12th driest | 1.10" (1950-51) | 13.41" (1986-87) |
| Central | 6.01" | -3.48" | 63% | 30th driest | 2.39" (1921-22) | 17.17" (1984-85) |
| S. Central | 5.72" | -5.92" | 49% | 17th driest | 2.10" (1950-51) | 22.55" (2015-16) |
| Statewide | 6.07" | -3.53" | 63% | 23rd driest | 2.44" (1950-51) | 15.80" (2015-16) |

Winter Dec 01 through 30-Jan-2022

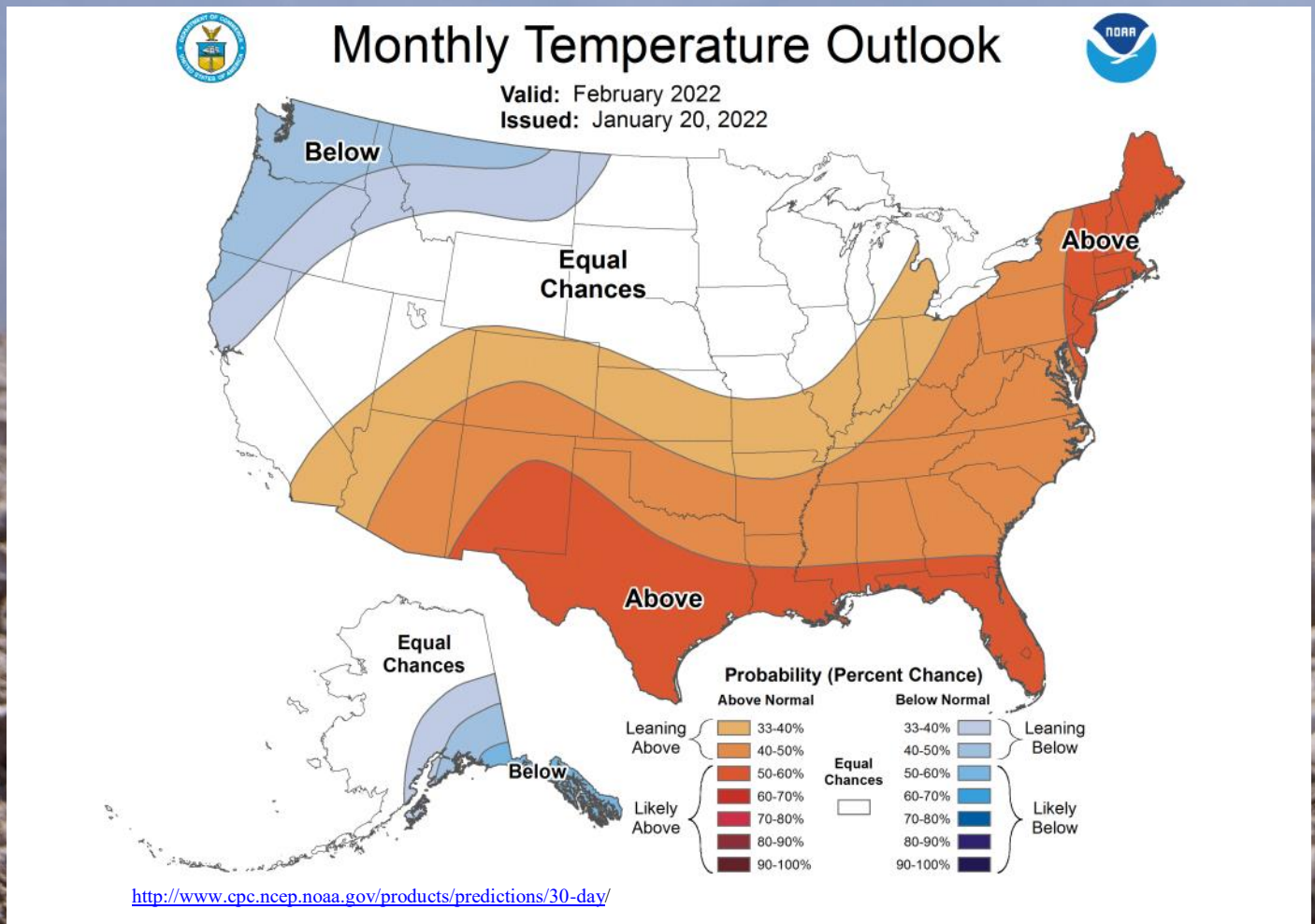| Climate Division | Total Rainfall | Departure from Normal | Pct of Normal | Rank since 1921 (88 periods) | Driest on Record | Wettest on Record |
|---|---|---|---|---|---|---|
| W. Central | 0.27" | -1.86" | 13% | 4th driest | 0.07" (2017-18) | 5.20" (1984-85) |
| Central | 0.94" | -2.43" | 28% | 7th driest | 0.49" (2010-11) | 9.11" (1984-85) |
| S. Central | 1.66" | -2.88" | 37% | 12th driest | 0.93" (1951-52) | 10.95" (1997-98) |
| Statewide | 1.50" | -2.09" | 42% | 11th driest | 0.99" (1955-56) | 7.43" (1997-98) |

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/

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# NOAA One-Month Outlook

## Monthly Temperature Outlook

**Valid:** February 2022
**Issued:** January 20, 2022

http://www.cpc.ncep.noaa.gov/products/predictions/30-day/
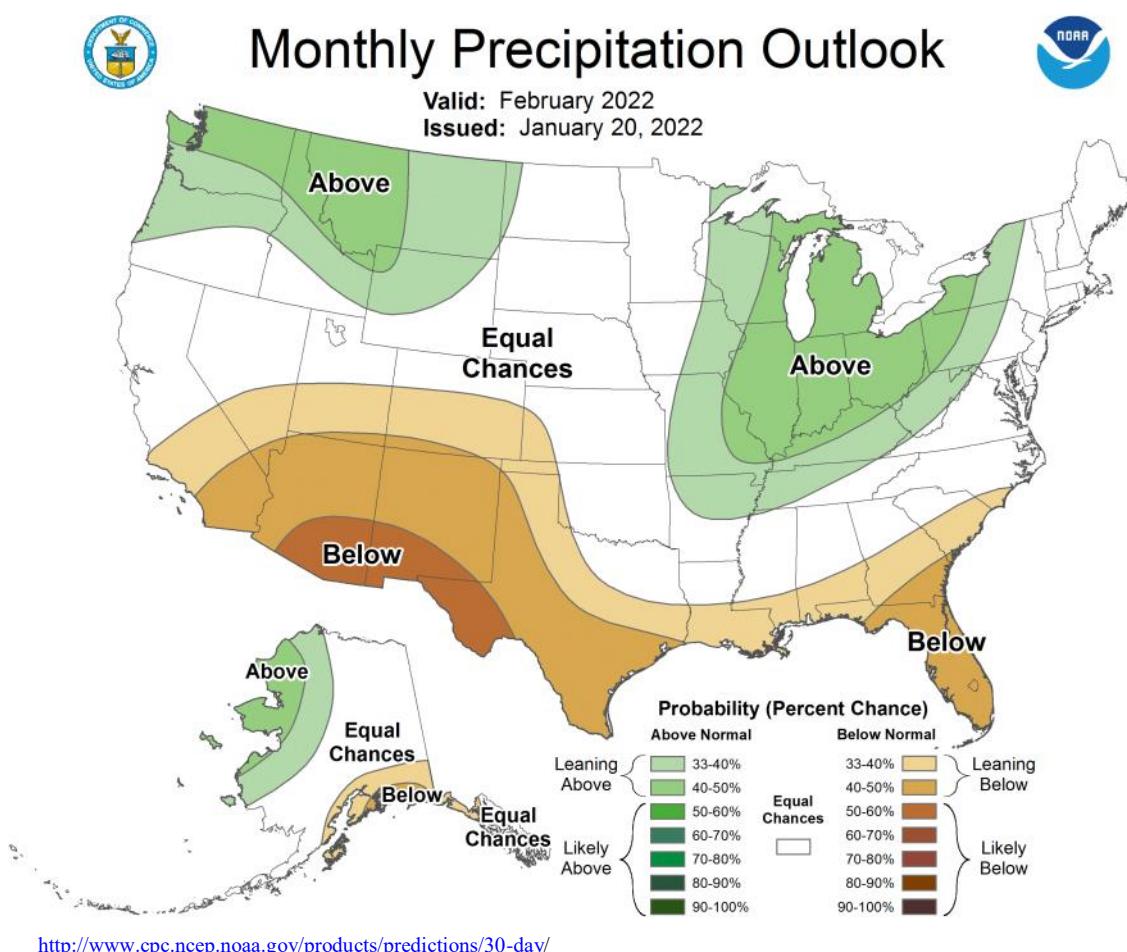
White areas are shown as EC (Equal Chance) on these maps represent areas where there are no strong climate signals from the climate tools to have skill in preferring one category over another.

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.

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# NOAA One-Month Outlook



## Monthly Precipitation Outlook
**Valid:** February 2022
**Issued:** January 20, 2022

http://www.cpc.ncep.noaa.gov/products/predictions/30-day/

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.
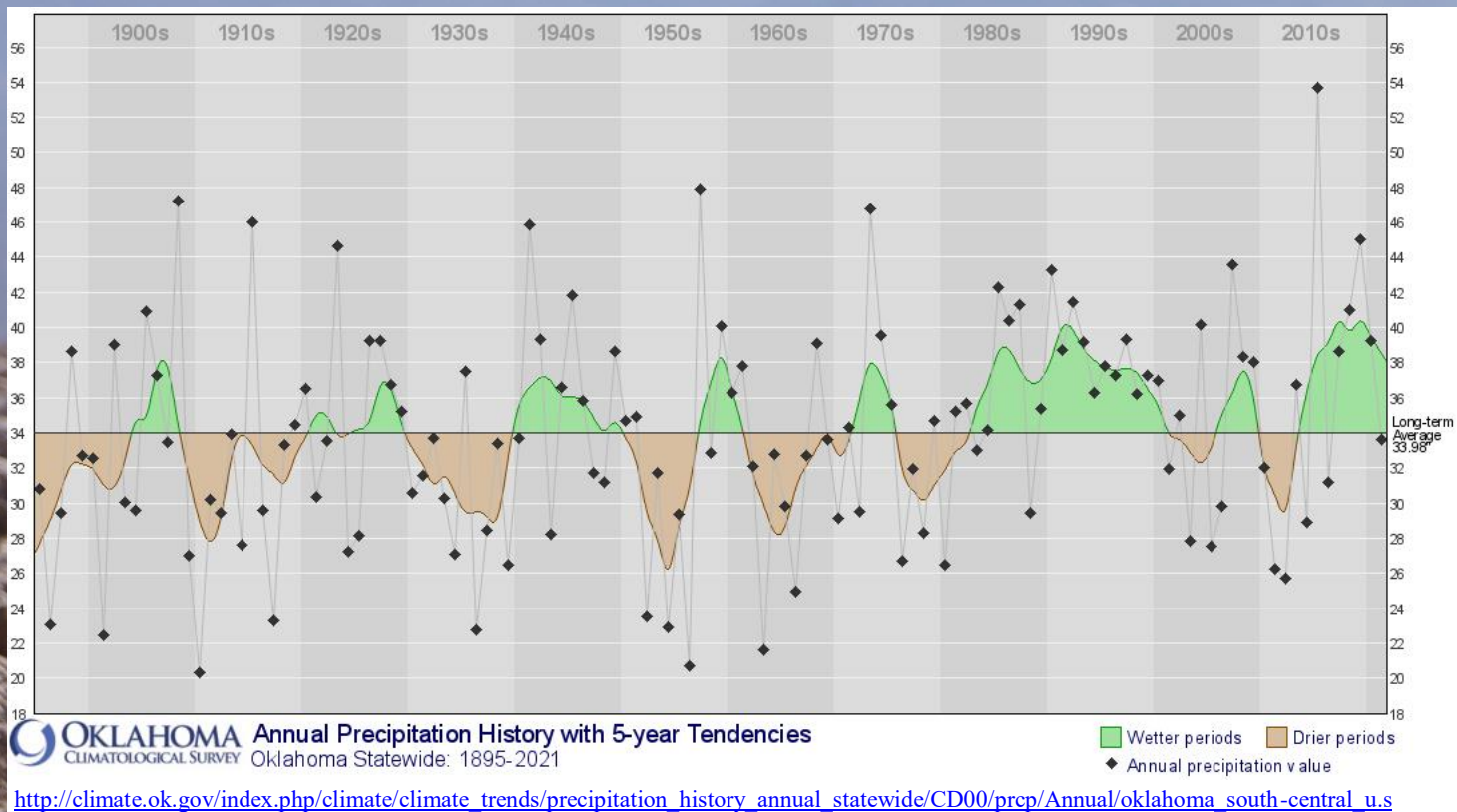
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# Annual Precipitation History
# with 5-Year Tendencies



Annual Precipitation History with 5-year Tendencies
Oklahoma Statewide: 1895-2021

Wetter periods • Drier periods
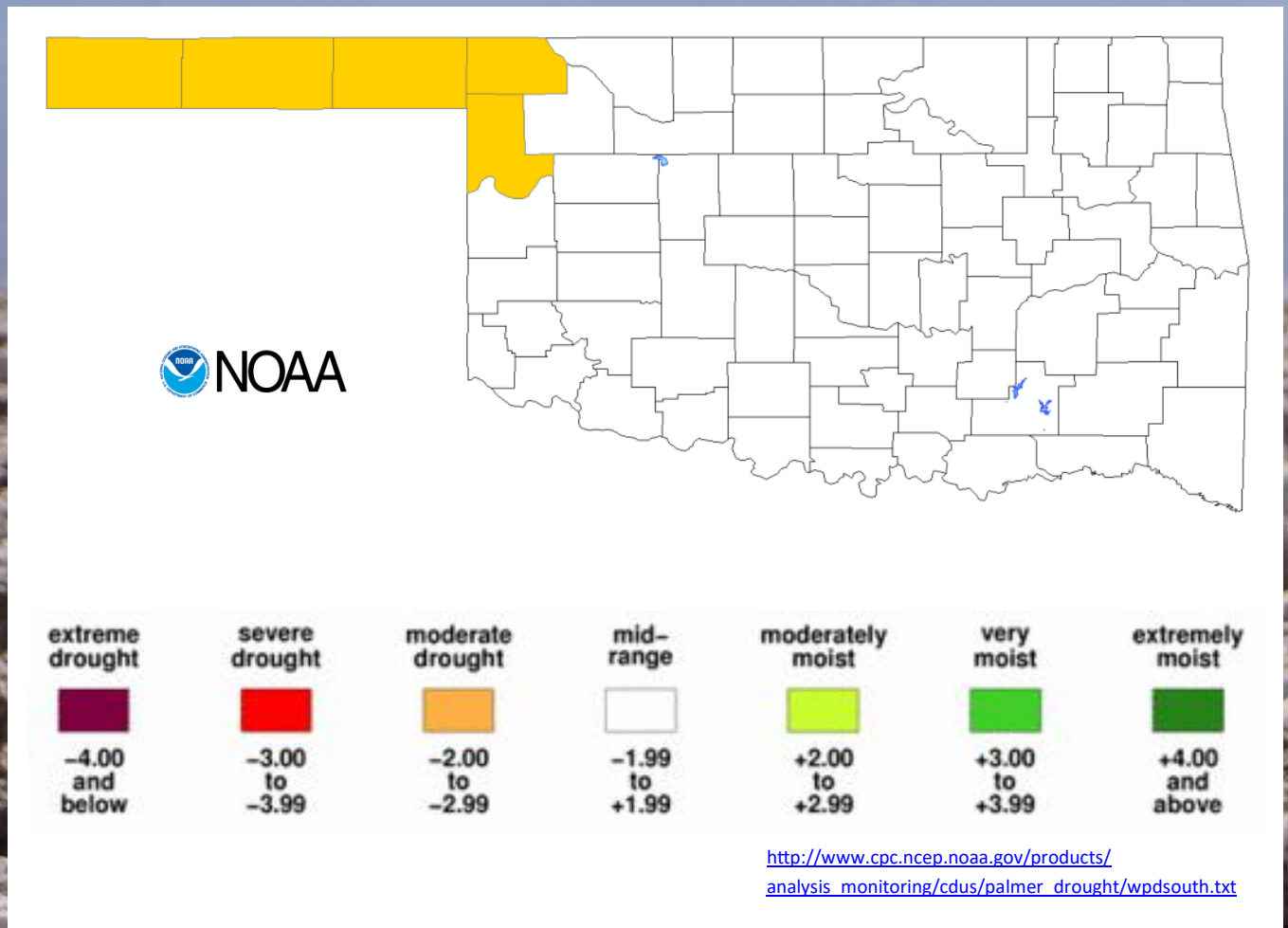Annual precipitation value

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

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.

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# Drought Severity Index by Climate Division

## Palmer Value Ending 29 JAN 2022



| extreme drought | severe drought | moderate drought | mid–range | moderately moist | very moist | extremely moist |
|---|---|---|---|---|---|---|
| −4.00 and below | −3.00 to −3.99 | −2.00 to −2.99 | −1.99 to +1.99 | +2.00 to +2.99 | +3.00 to +3.99 | +4.00 and above |

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

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.

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# U.S. Drought Monitor

| Week | Date | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|---|
| Current | 2022-01-25 | 3.91 | 96.09 | 88.23 | 77.66 | 49.17 | 2.90 |
| Last Week | 2022-01-18 | 4.80 | 95.20 | 88.04 | 73.86 | 46.55 | 2.06 |
| 3 Months Ago | 2021-10-26 | 5.05 | 94.95 | 40.74 | 10.90 | 0.77 | 0.00 |
| Start of Calendar Year | 2021-12-28 | 4.92 | 95.08 | 90.17 | 72.51 | 22.62 | 0.00 |
| Start of Water Year | 2021-09-28 | 6.45 | 93.55 | 73.23 | 23.72 | 2.65 | 0.00 |
| One Year Ago | 2021-01-26 | 75.15 | 24.85 | 10.93 | 4.05 | 0.23 | 0.00 |

## U.S. Drought Monitor
# Oklahoma

Abnormal dryness or drought are currently affecting approximately 3,307,948 people in Oklahoma.
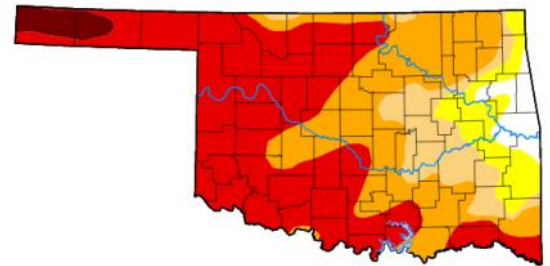


Intensity:

D0 - Abnormally Dry
D1 - Moderate Drought
D2 - Severe Drought
D3 - Extreme Drought
D4 - Exceptional Drought

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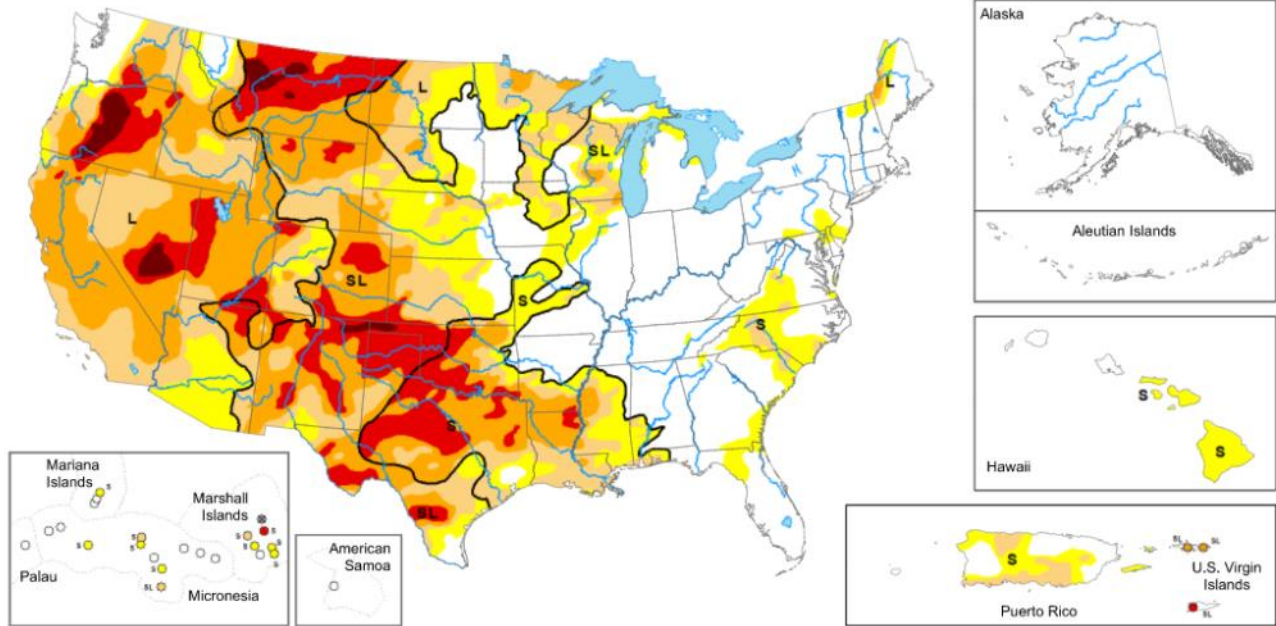NIDIS Drought.gov
U.S. Drought Portal

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

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# U.S. Drought Monitor Nationwide Map



**Map released: January 27, 2022**

Data valid: January 25, 2022

United States and Puerto Rico Author(s):
Brad Rippey, U.S. Department of Agriculture

Pacific Islands and Virgin Islands Author(s):
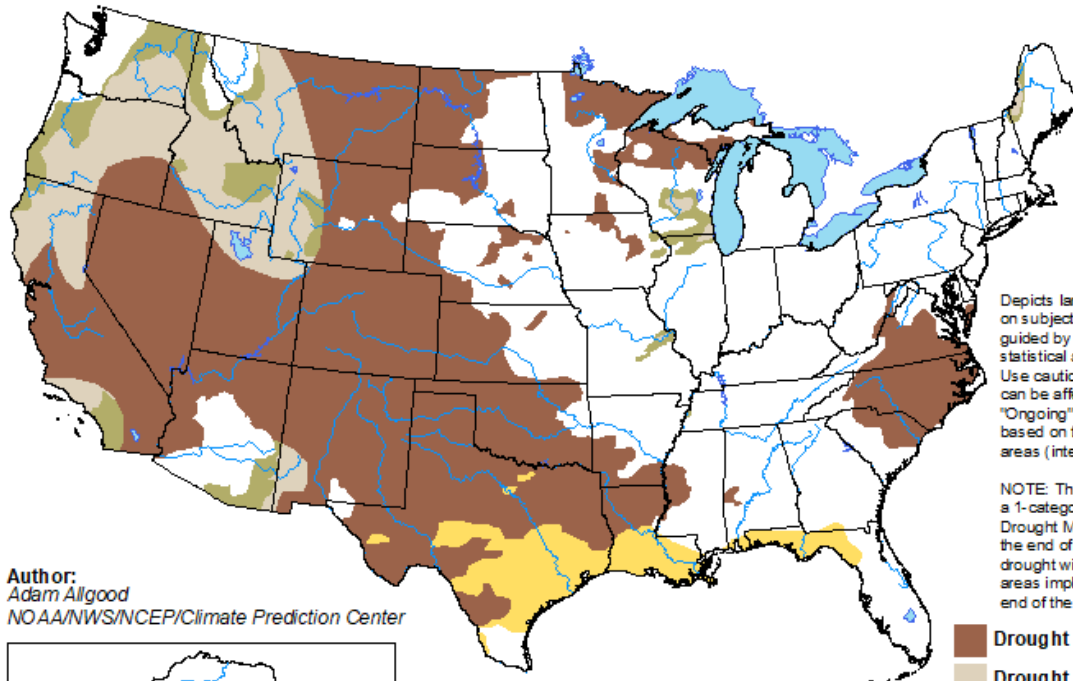Richard Heim, NOAA/NCEI

http://droughtmonitor.unl.edu
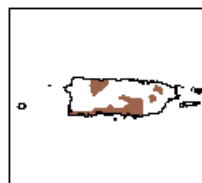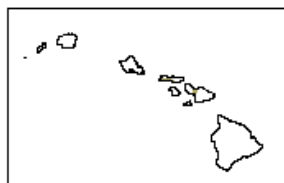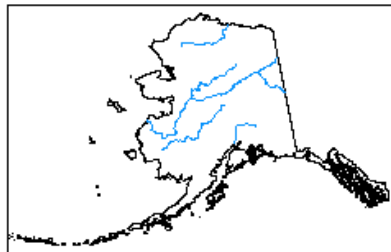
# U.S. Drought Monitor

# Monthly Drought Outlook Map

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

Valid for January 2022
Released December 31, 2021

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).

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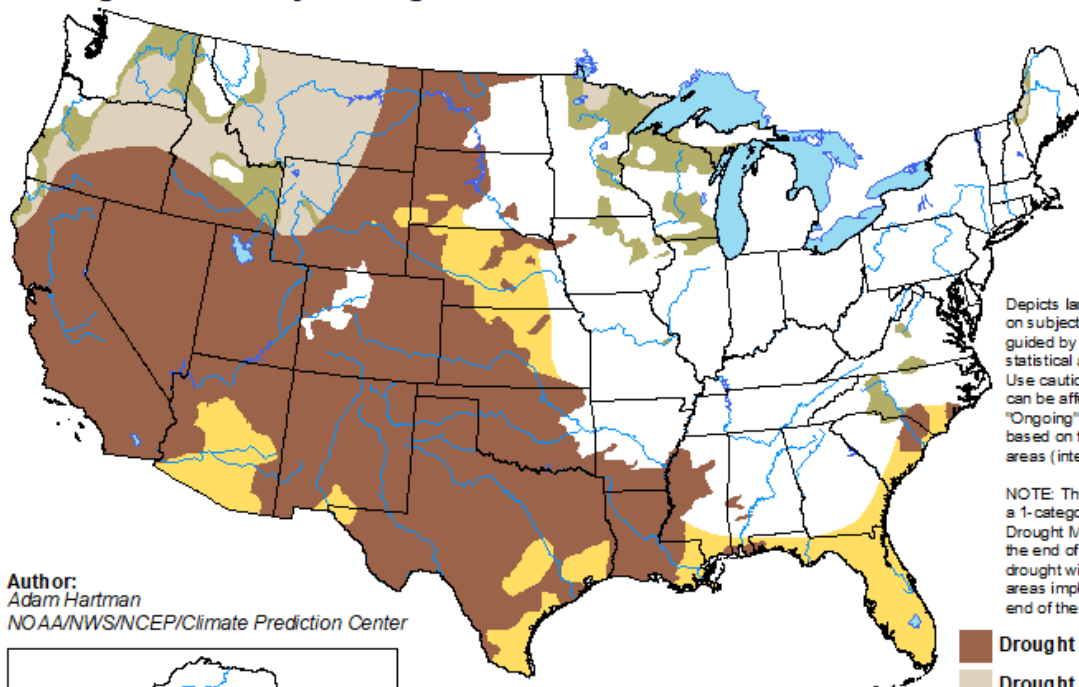- Drought development likely

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

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

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# U.S. Drought Monitor

## Seasonal Drought Outlook Map



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

Valid for January 20 - April 30, 2022
Released January 20

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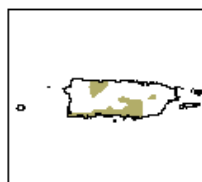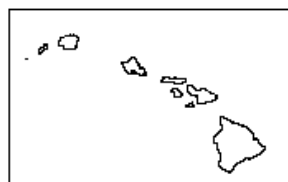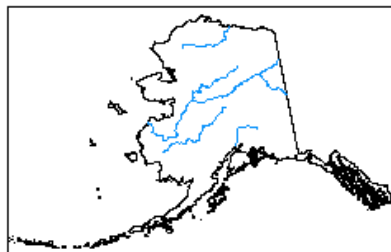
Drought persists
Drought remains but improves
Drought removal likely
Drought development likely

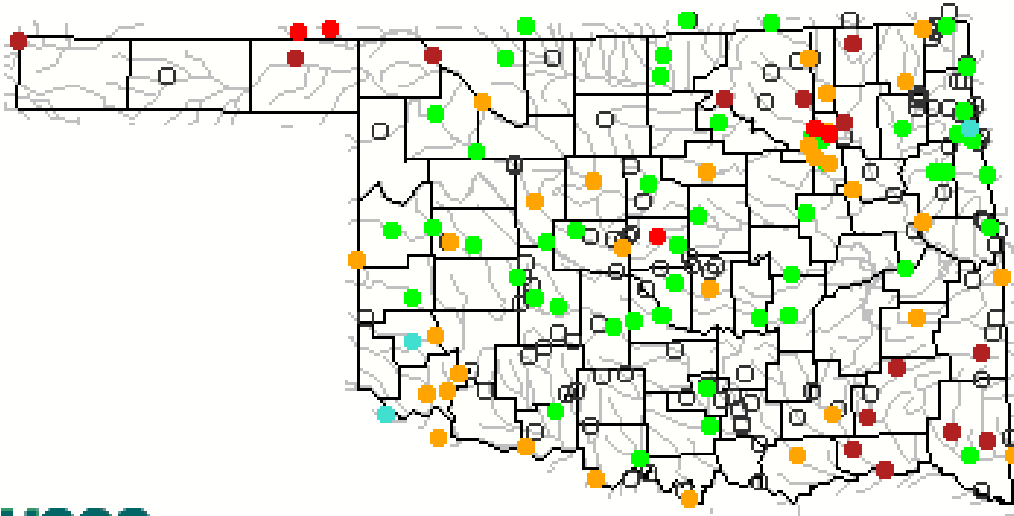http://go.usa.gov/3eZ73

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

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# USGS Streamflow Data

## Monday, January 31, 2022 14:30ET

| | 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 | | |

## Sunday, January 30, 2022

**Below normal 28-day average streamflow**

| | 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__map|m__pa28d_dwc&r=ok

# SOIL MOISTURE MAP



**Mesonet**

1-day Average 24-inch Fractional Water Index

January 30, 2022
Created 6:30:14 AM January 31, 2022 CST. © Copyright 2022

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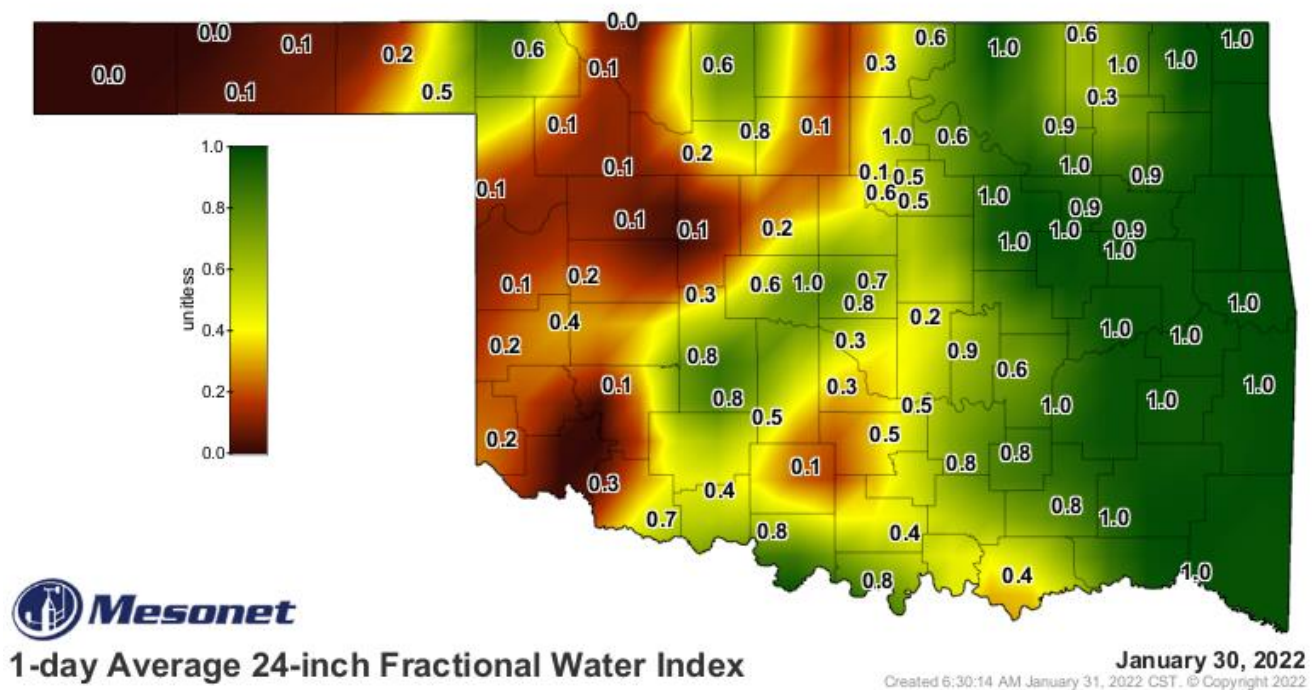
http://www.mesonet.org/index.php/weather/map/24-inch_fractional_water_index/soil_moisture

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# CONSECUTIVE DAYS WITHOUT RAINFALL MAP
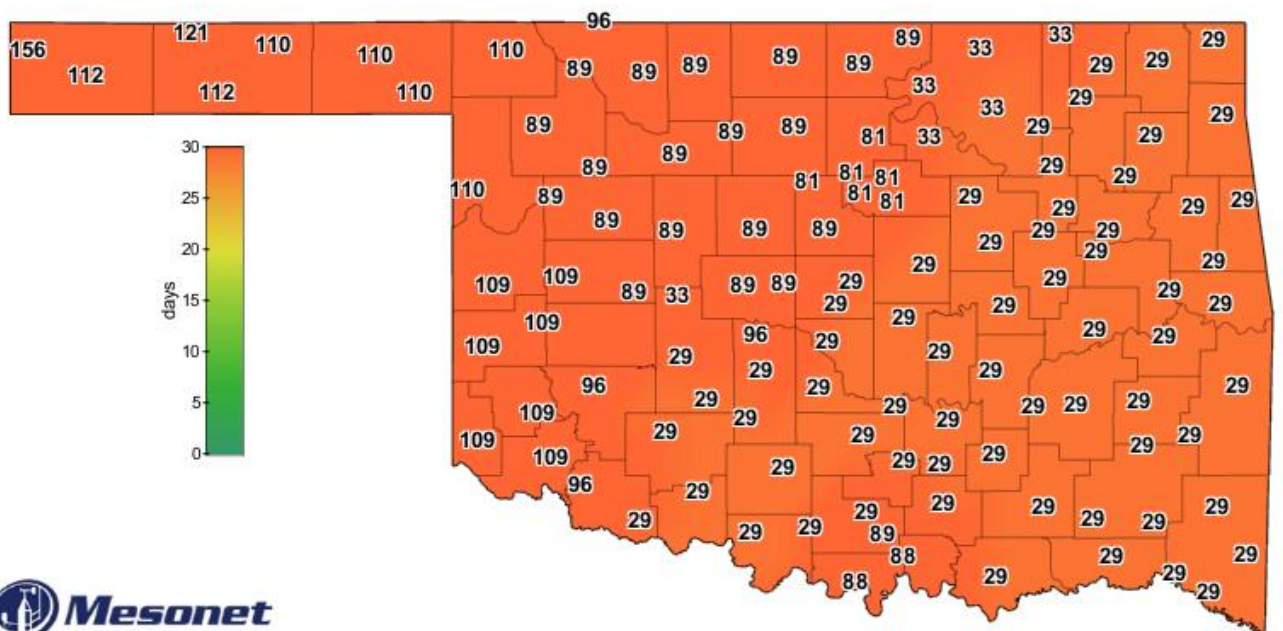


http://www.mesonet.org/index.php/weather/map/
consecutive_days_with_less_than_0.25_inches_Rainfall/rainfall

# Percent of Surface Water Conservation Storage
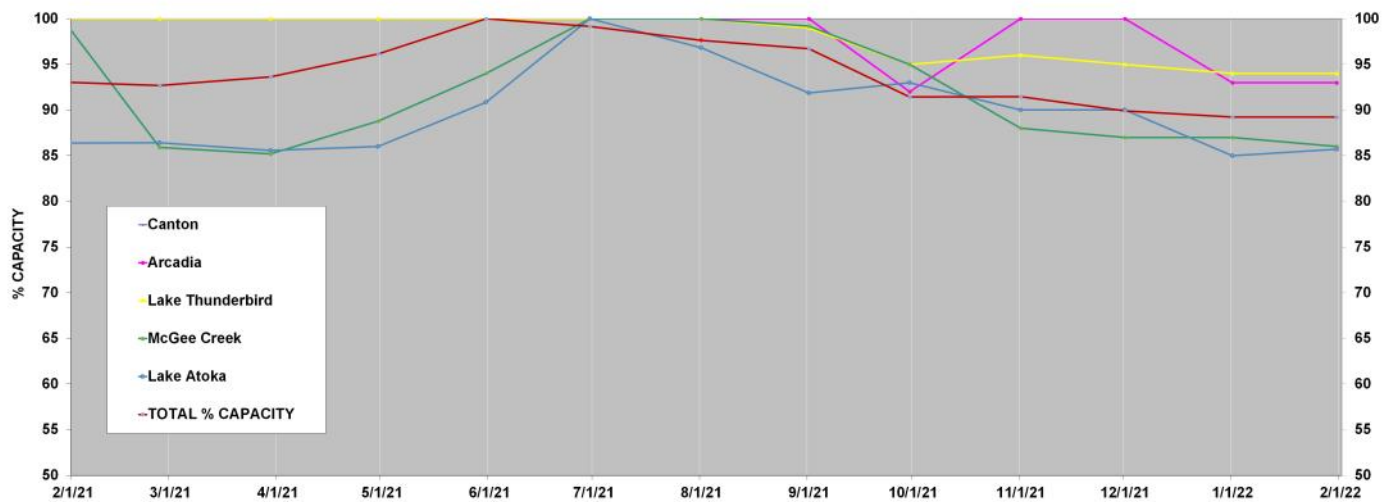## Central OK Reservoirs



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 1/1/2022 |
|---|---|---|
| Canton | 91.0 | 1.0 |
| Arcadia | 93.0 | 0.0 |
| Lake Thunderbird | 94.0 | 0.0 |
| McGee Creek | 86.0 | 0.0 |
| Lake Atoka | 85.7 | -0.7 |
| TOTAL % CAPACITY | 89.2 | 0.0 |

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

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.
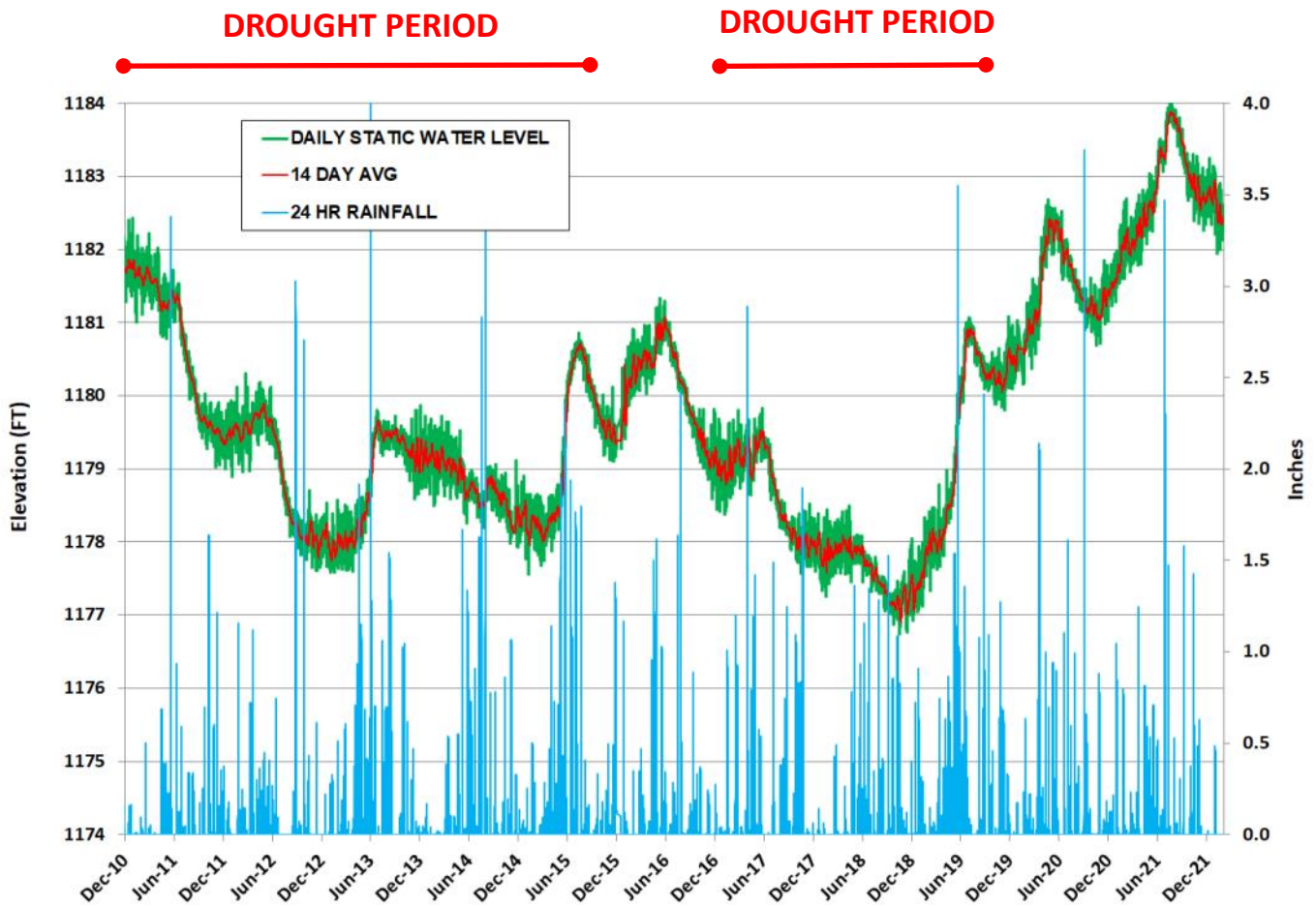
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# Oklahoma Surface Water Resources
## Reservoir Levels and Storage as of 1/24/2022



**Reservoir Storage**
(Percent of Normal Pool Storage as of 1/24/2022)

- > 100%
- 100% - 90%
- 89% - 80%
- 79% - 70%
- 69% - 60%
- 59% - 50%
- 49% - 40%
- 39% - 30%
- < 30%

**Reservoir Levels**

(+1) Positive number indicates the lake level in feet, above the normal pool elevation

(-1) Negative number indicates the lake level in feet, below the normal pool elevation

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 (http://www.swt-wc.usace.army.mil/Daily_Morning_Reservoir_Report.pdf), and the
U.S. Geological Survey (http://waterdata.usgs.gov/ok/nwis/current/?type=lake&group_key=basin_cd)
For more information please visit the OWRB's website at:
( http://www.owrb.ok.gov )

OWRB
State of Oklahoma
WATER RESOURCES BOARD
the water agency

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

# Groundwater Levels
## Spencer Mesonet Station



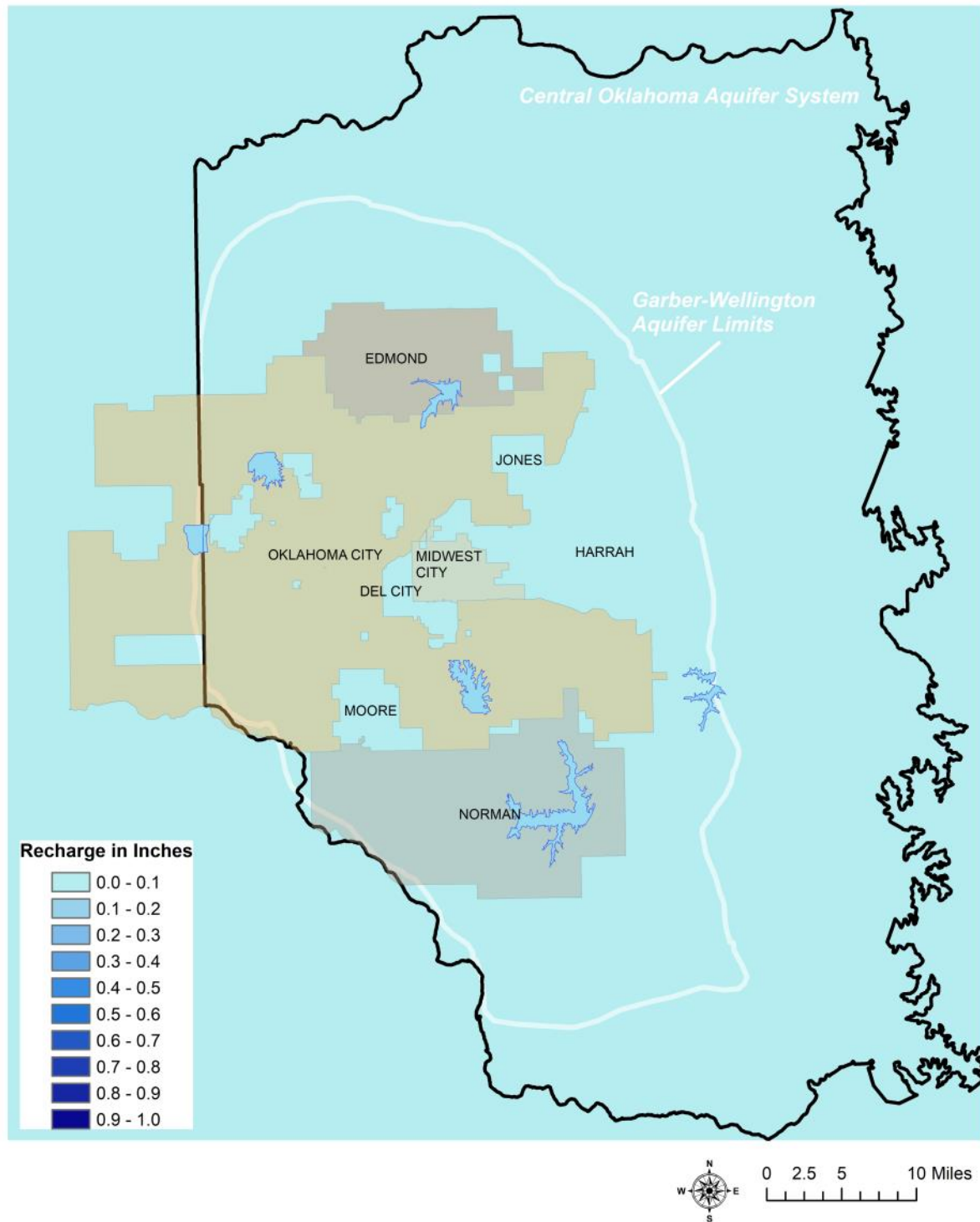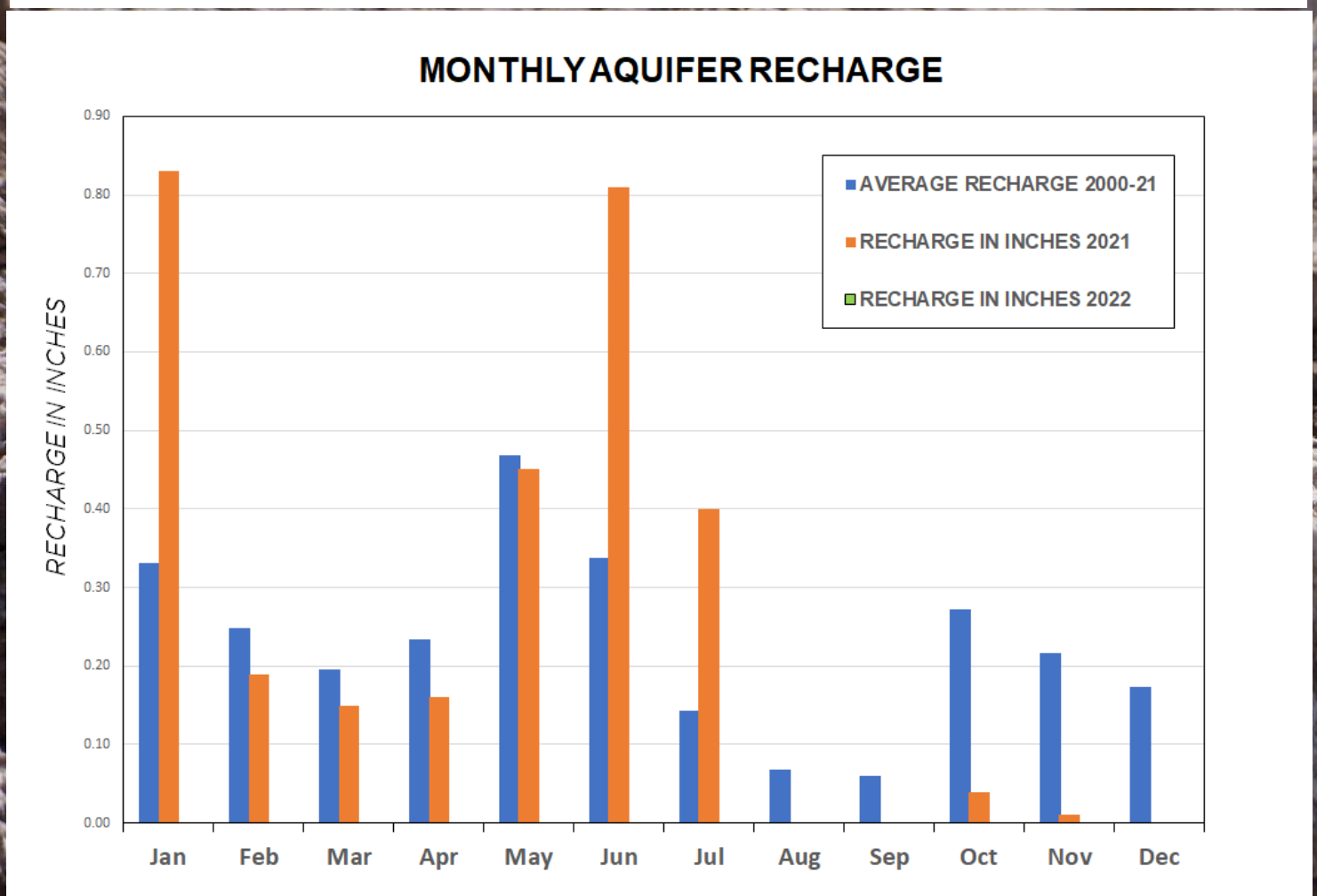http://www.mesonet.org/index.php/weather/groundwater

# Recharge Map
## Central Oklahoma Aquifer System



AQUIFER RECHARGE JAN 2022

Central Oklahoma Aquifer System

Garber-Wellington Aquifer Limits

EDMOND

JONES

OKLAHOMA CITY  MIDWEST CITY  HARRAH

DEL CITY

MOORE

NORMAN

**Recharge in Inches**
- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

0   2.5   5        10 Miles

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# Recharge Charts
## Central Oklahoma Aquifer System



ACCUMULATED RECHARGE 2022

- CUMULATIVE RECHARGE IN INCHES 2022
- CUMULATIVE AVERAGE RECHARGE



MONTHLY AQUIFER RECHARGE

- AVERAGE RECHARGE 2000-21
- RECHARGE IN INCHES 2021
- RECHARGE IN INCHES 2022

acog
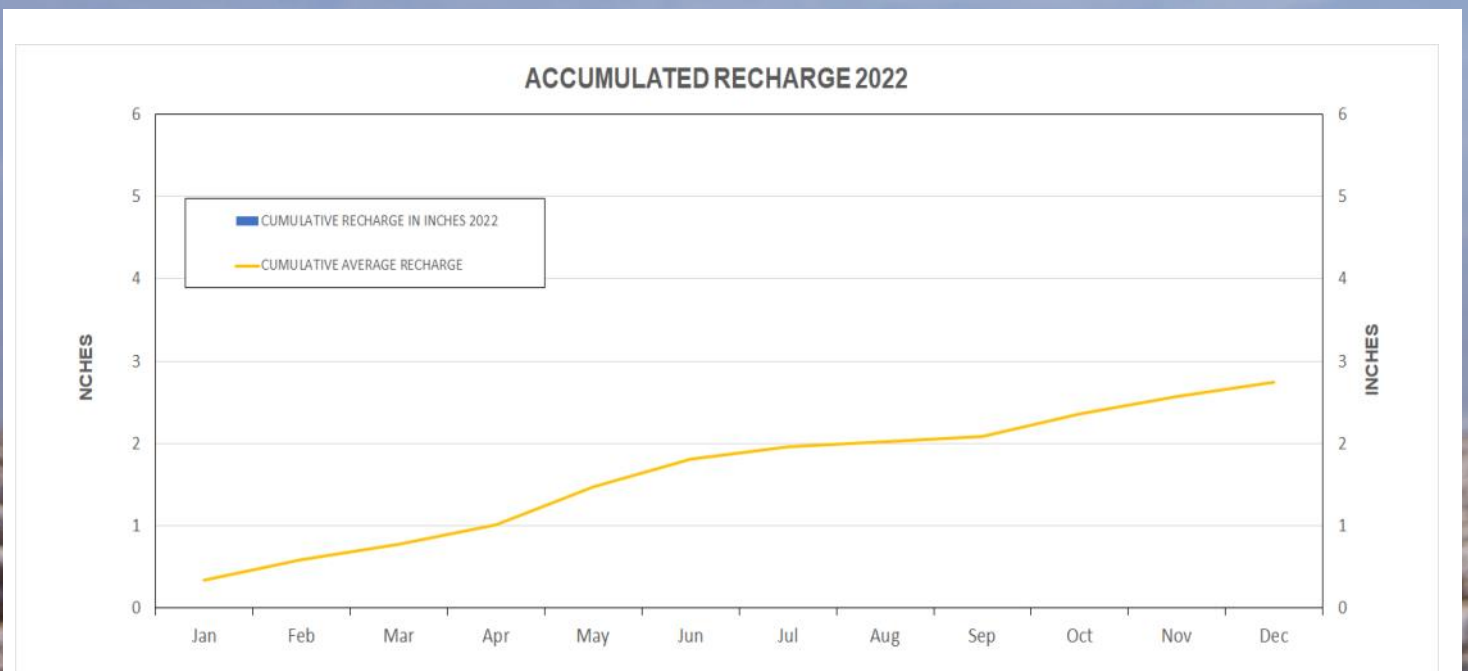
# ENSO Cycle
# Recent Evolution, Current Status and Predictions



CFSv2 forecast Nino3.4 SST anomalies (K) (PDF corrected)

Average SST Anomalies
2 JAN 2022 – 29 JAN 2022
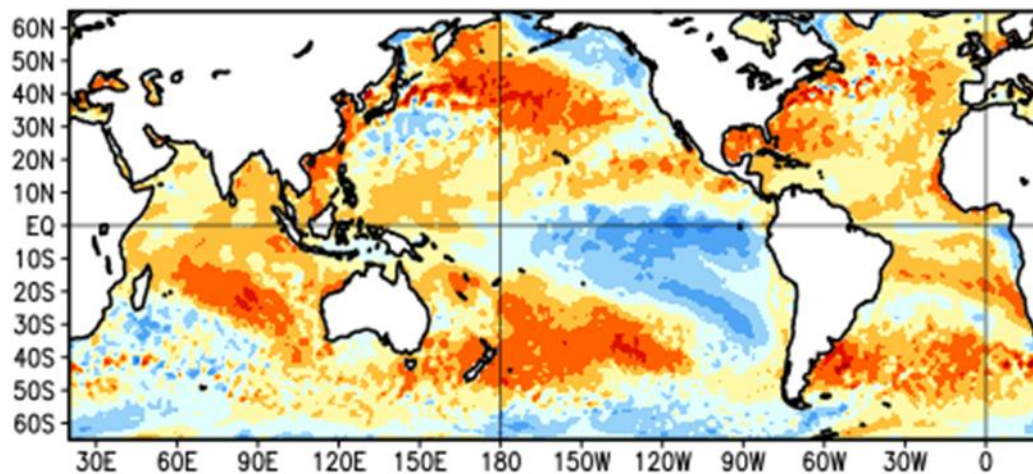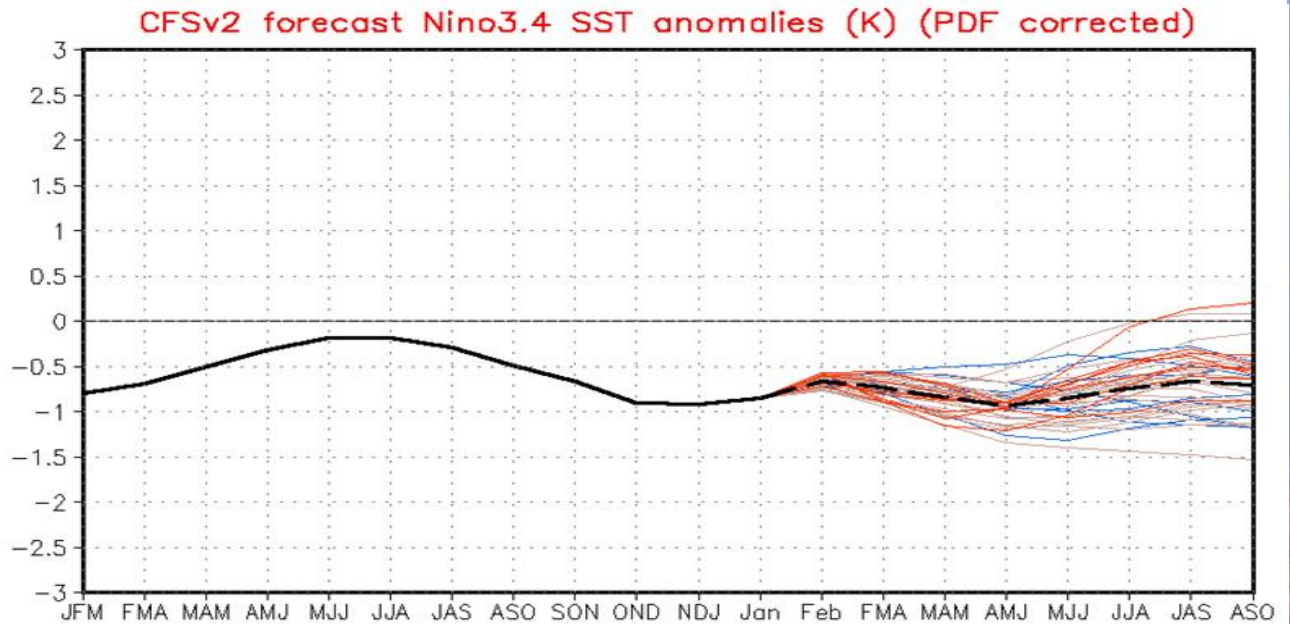
## Summary

ENSO Alert System Status:  La Niña Advisory

- La Niña is present.

- Equatorial sea surface temperatures (SSTs) are below average across the central and east-central Pacific Ocean.

- The tropical Pacific atmosphere is consistent with La Niña.

- La Niña is likely to continue into the Northern Hemisphere spring (67% chance during March-May 2022) and then transition to ENSO-neutral (51% chance during April-June 2022) .

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

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