



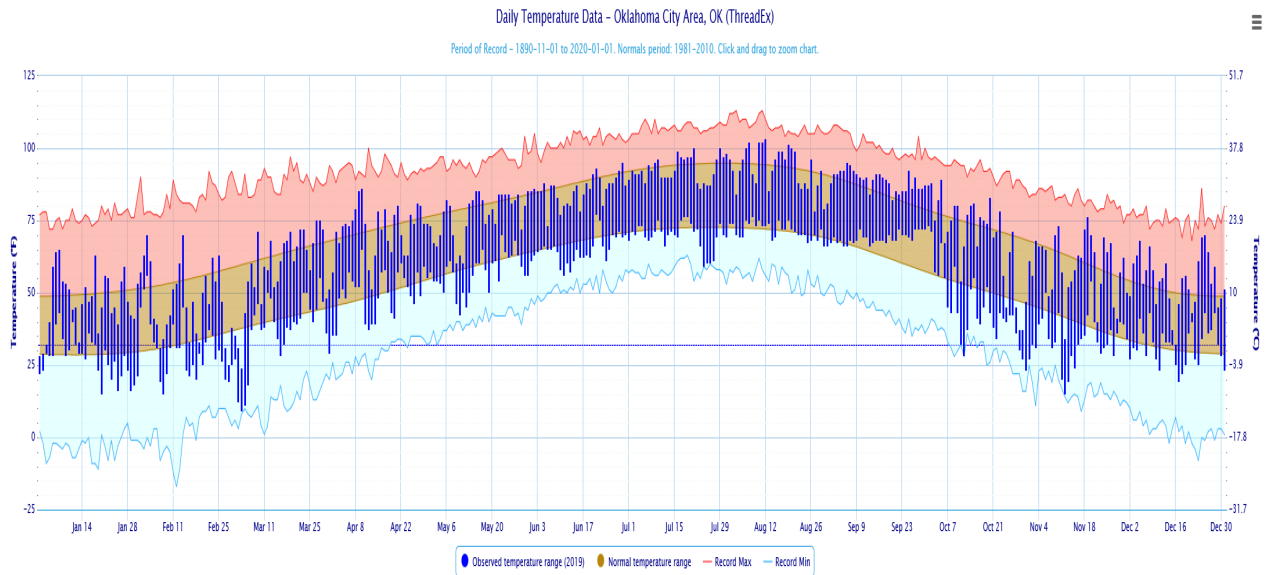
# **Drought Conditions in Central Oklahoma**

**Water Resources Division  
Association of Central Oklahoma Governments  
January 3, 2020**

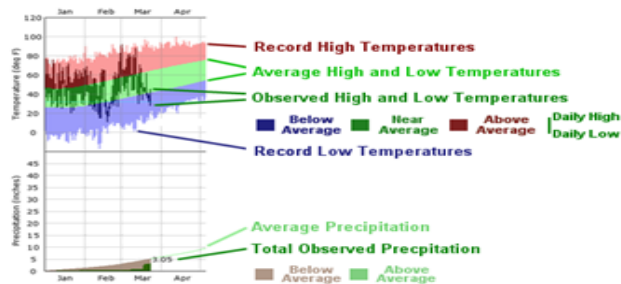
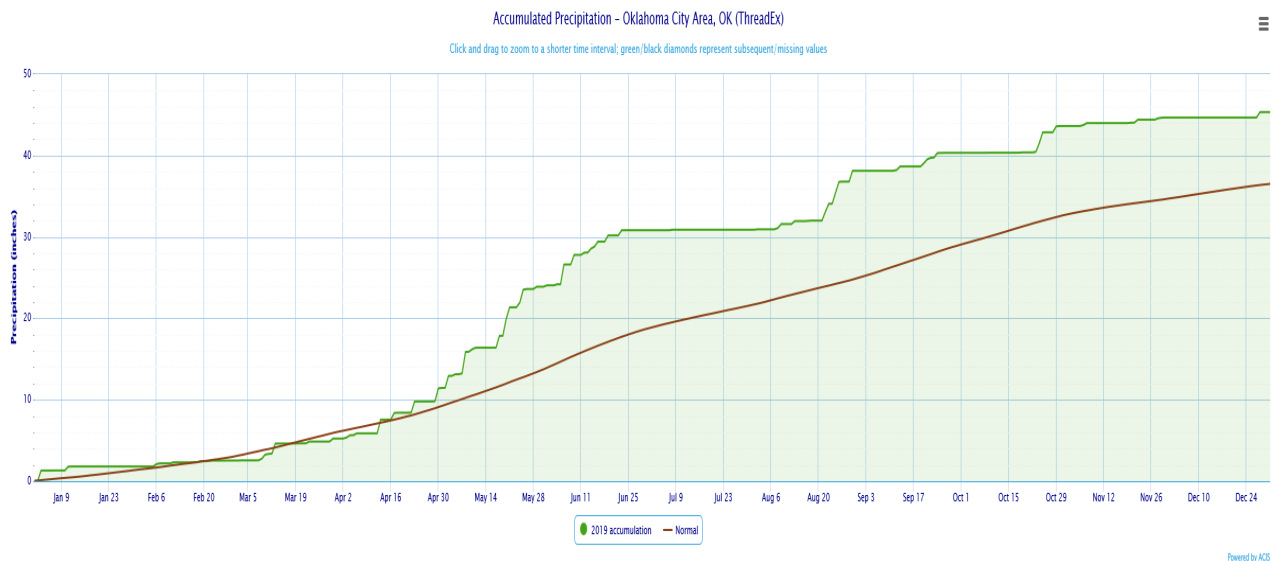


# Temperature and Precipitation Plot for Oklahoma City, Oklahoma for 2019

## 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-2019 through 01-Jan-2020

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	35.10"	+6.70"	124%	10th wettest	14.18" (1956-57)	43.12" (1997-98)
Central	48.22"	+10.59"	128%	5th wettest	20.07" (1954-55)	54.33" (2007-08)
S. Central	44.93"	+4.22"	110%	21st wettest	20.12" (1963-64)	72.44" (2015-16)
Statewide	45.50"	+9.03"	125%	5th wettest	20.81" (1956-57)	54.08" (2015-16)

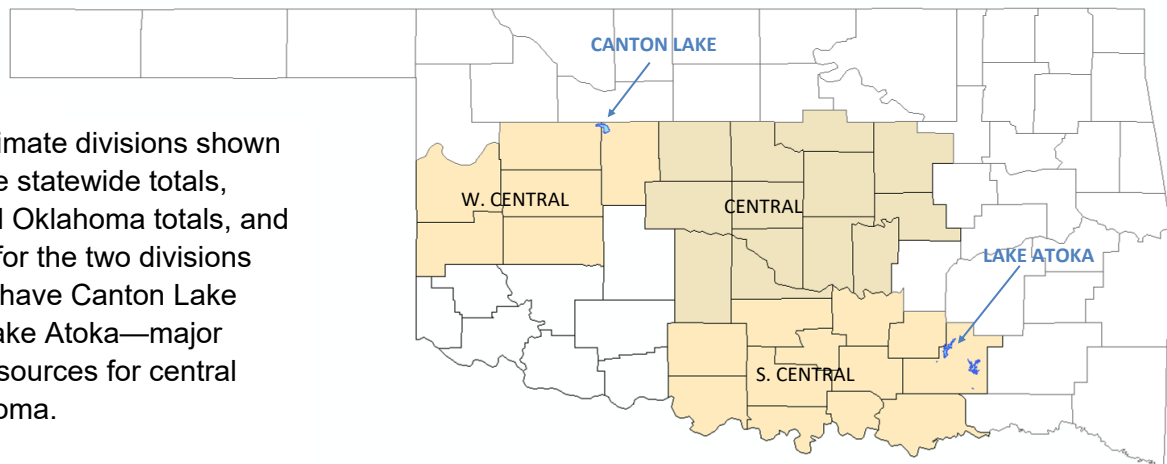
Water Year: 01-Oct-2019 through 01-Jan-2020

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	3.46"	-2.11"	62%	36th driest	0.14" (1921-22)	11.99" (1986-87)
Central	7.32"	-0.84"	90%	43rd wettest	0.92" (1945-46)	16.24" (1941-42)
S. Central	9.94"	+0.18"	102%	37th wettest	0.97" (1950-51)	21.86" (2015-16)
Statewide	8.47"	+0.34"	104%	36th wettest	1.12" (1950-51)	15.35" (2015-16)

Winter 01-Dec through 01-Jan-2020

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	1.06"	-0.19"	85%	39th wettest	0.00" (1976-77)	4.28" (1984-85)
Central	0.85"	-1.19"	42%	29th driest	0.10" (1950-51)	8.06" (1984-85)
S. Central	1.00"	-1.66"	37%	23rd driest	0.07" (1950-51)	7.15" (2015-16)
Statewide	1.12"	-1.00"	53%	31st driest	0.09" (1950-51)	5.80" (2015-16)

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.

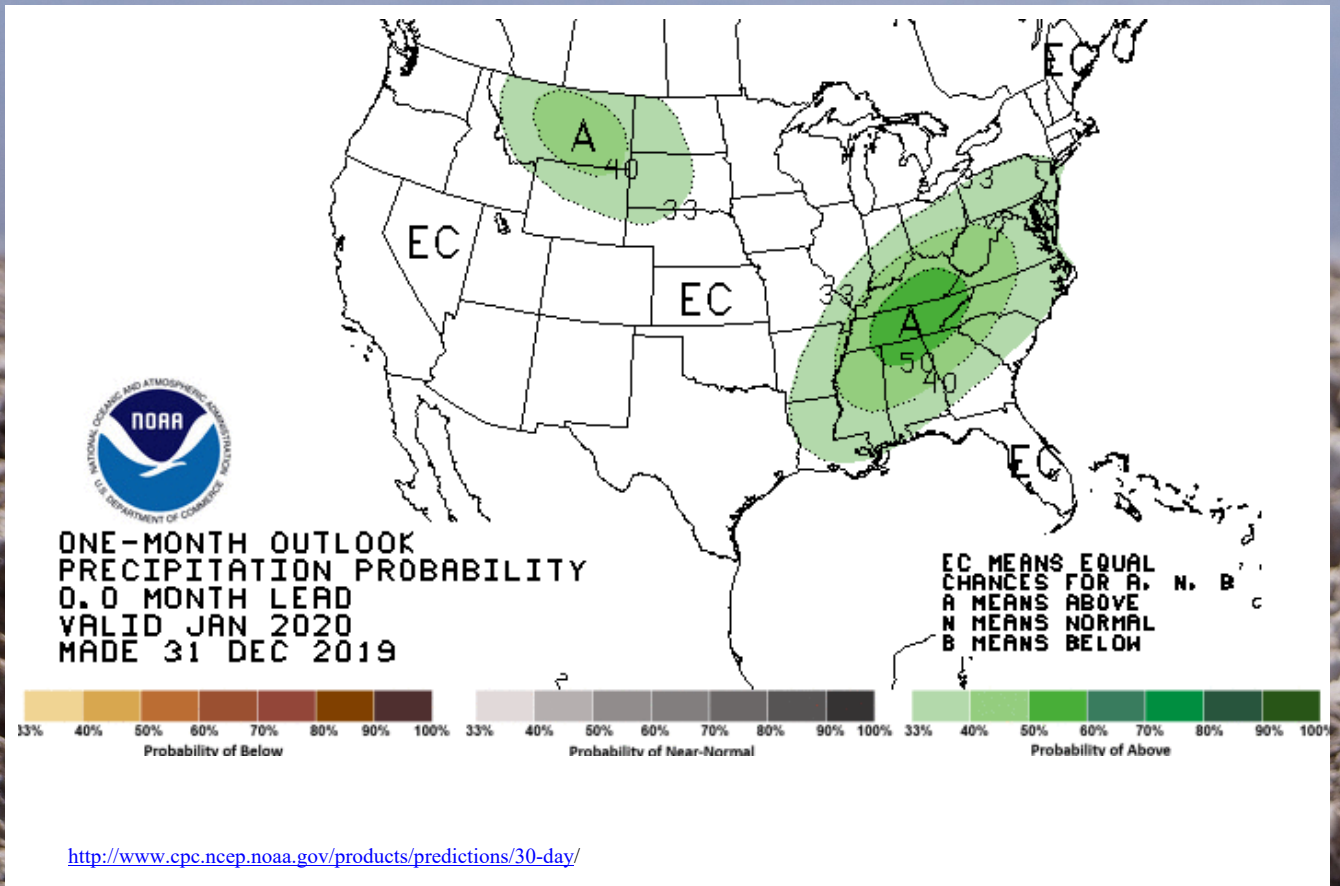


[http://climate.ok.gov/index.php/drought/last\\_30\\_days/](http://climate.ok.gov/index.php/drought/last_30_days/)

OKLAHOMA  
CLIMATOLOGICAL SURVEY



# NOAA One-Month Outlook

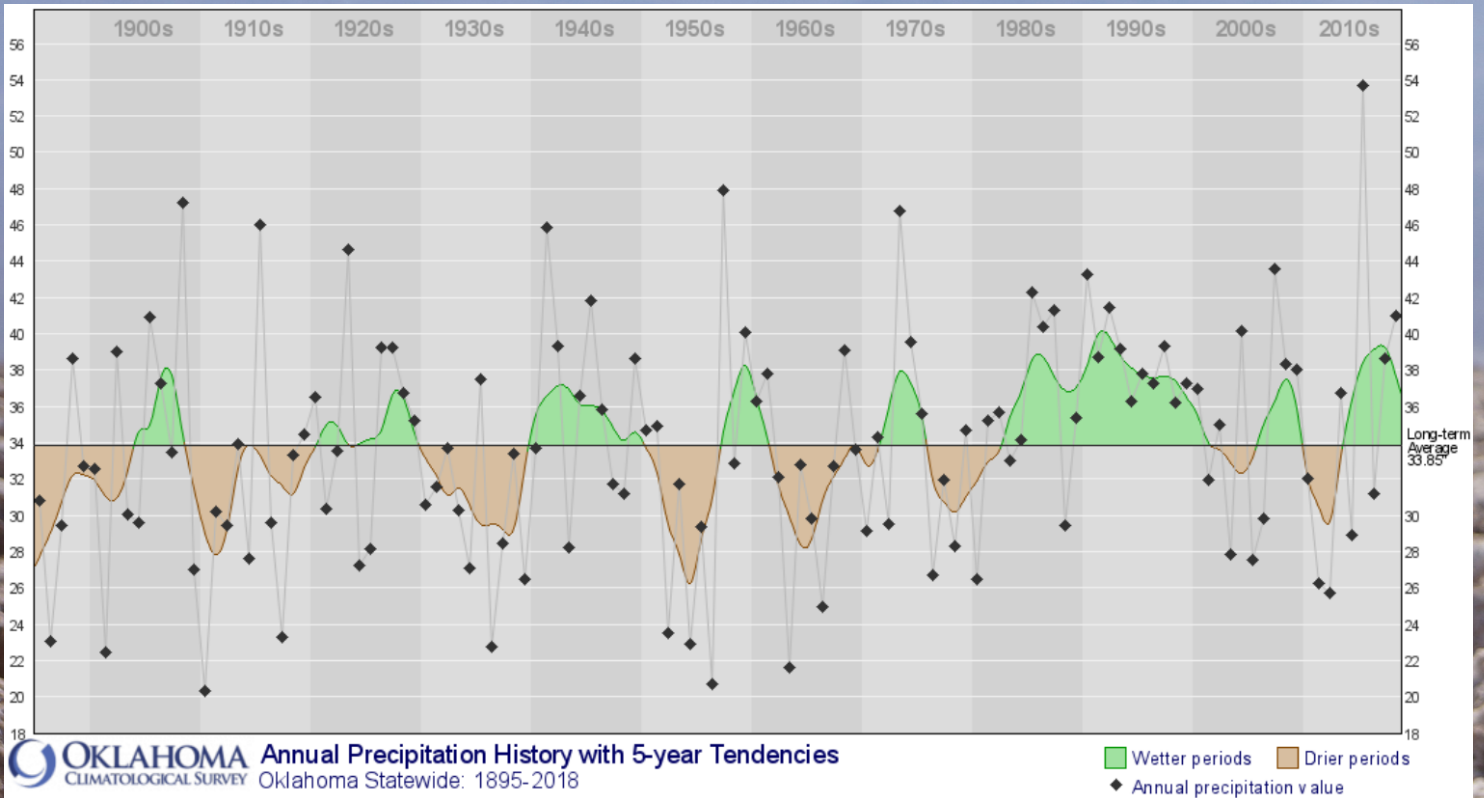


White areas are shown as EC (Equal Chance) on these maps represent areas where there are no strong climate signals from the climate tools to have skill in preferring one category over another.

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



[http://climate.ok.gov/index.php/climate/climate\\_trends/precipitation\\_history\\_annual\\_statewide/CD00/prec/Annual/oklahoma\\_south-central\\_u.s](http://climate.ok.gov/index.php/climate/climate_trends/precipitation_history_annual_statewide/CD00/prec/Annual/oklahoma_south-central_u.s)

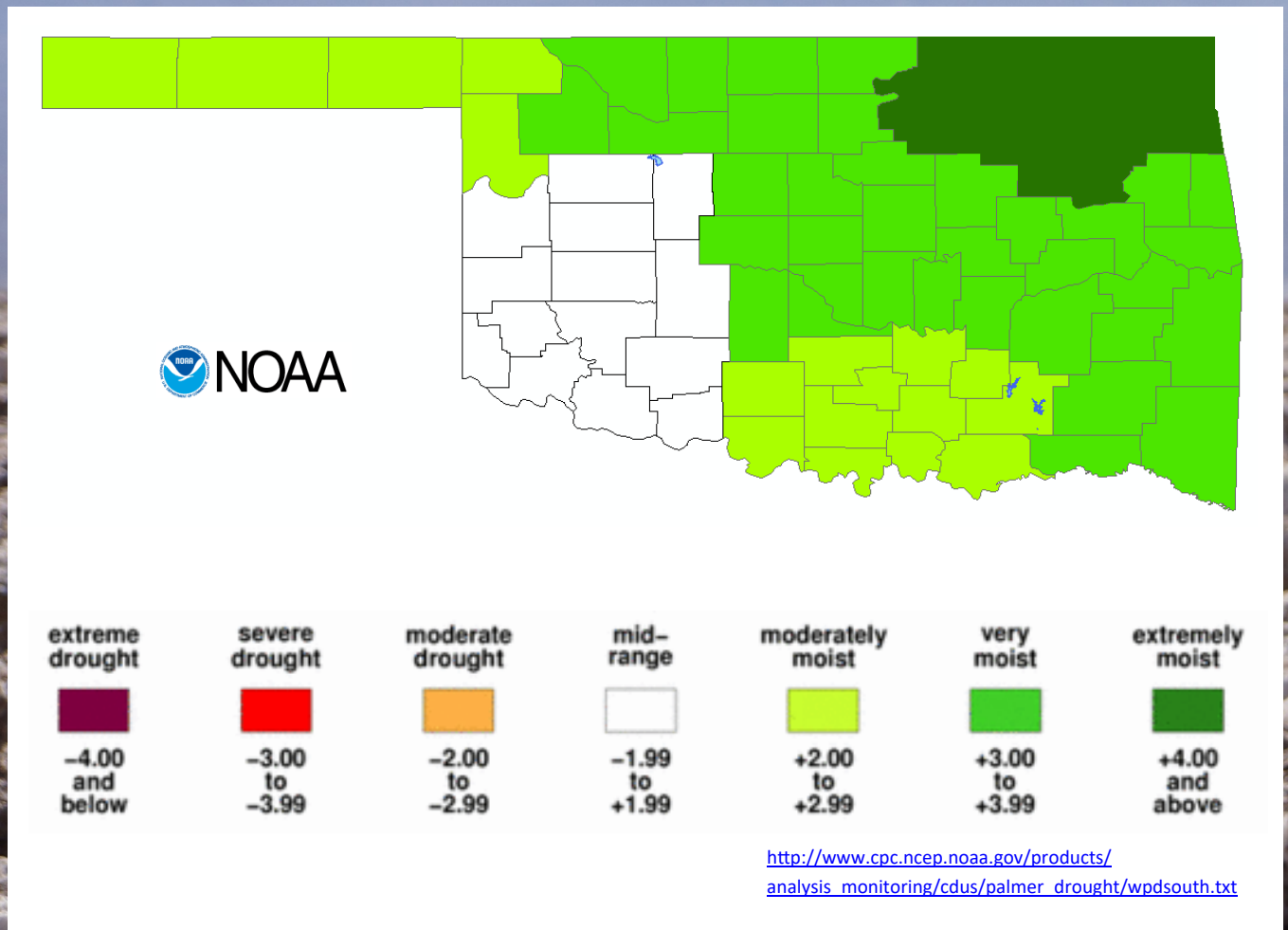
This graph shows the cyclical nature of wet and drought periods in Oklahoma. The black dots represent the annual precipitation for that particular year. The line represents the annual precipitation data smoothed over five years.

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.



# Drought Severity Index by Climate Division

## Palmer Value Ending 28 DEC 2019



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.

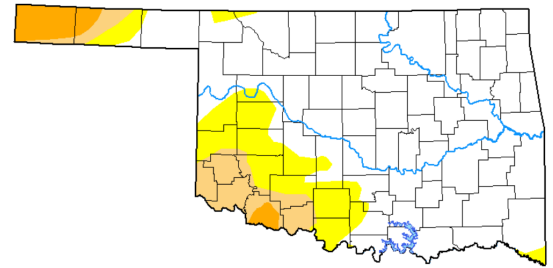
On these maps, the red shading denotes drought conditions while the green shading indicates wet conditions.

# U.S. Drought Monitor

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	<a href="#">12/31/2019</a>	76.45	23.55	10.47	3.64	0	0
Last Week	<a href="#">12/24/2019</a>	60.87	39.13	18.07	3.64	0	0
3 Months Ago	<a href="#">10/1/2019</a>	71.94	28.06	11.08	1.01	0	0
Start of Calendar Year	<a href="#">1/1/2019</a>	94.85	5.15	0	0	0	0
Start of Water Year	<a href="#">10/1/2019</a>	71.94	28.06	11.08	1.01	0	0
One Year Ago	<a href="#">1/1/2019</a>	94.85	5.15	0	0	0	0

## U.S. Drought Monitor Oklahoma

Abnormal dryness or drought are currently affecting approximately 113,555 people in Oklahoma.



Intensity:

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

■ D3 - Extreme Drought  
■ D4 - Exceptional Drought

NATIONAL  
INTEGRATED  
DROUGHT  
INFORMATION  
SYSTEM



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

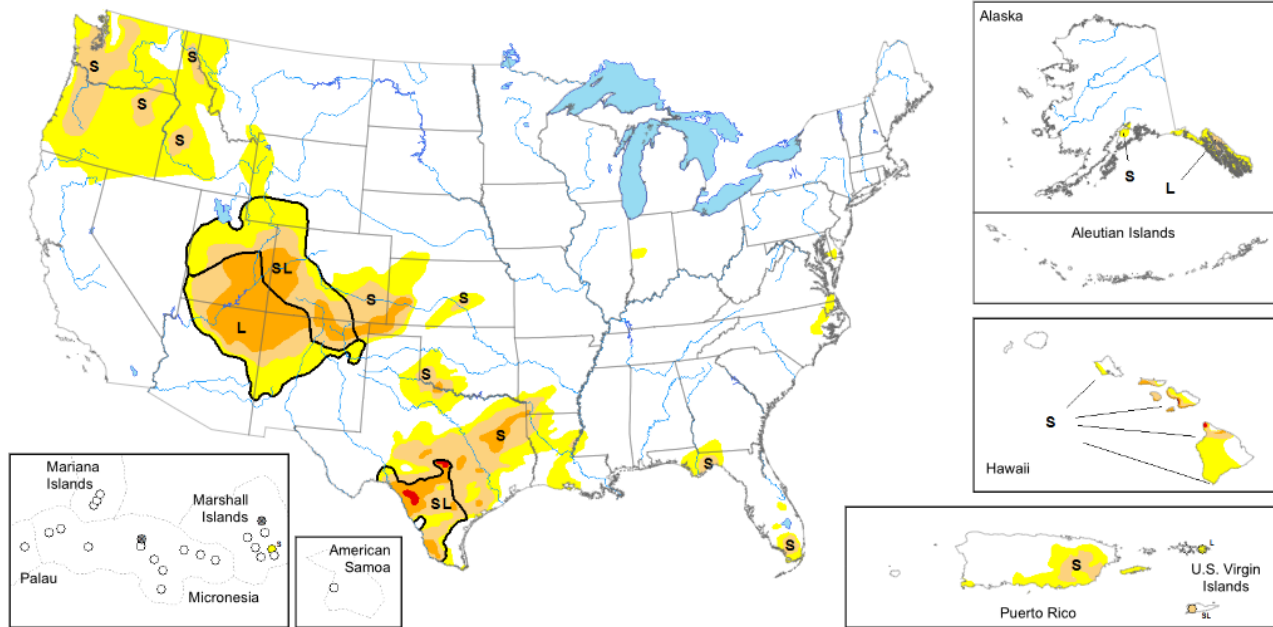
<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OK>



# U.S. Drought Monitor Nationwide Map

Map released: January 2, 2020

Data valid: December 31, 2019



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>

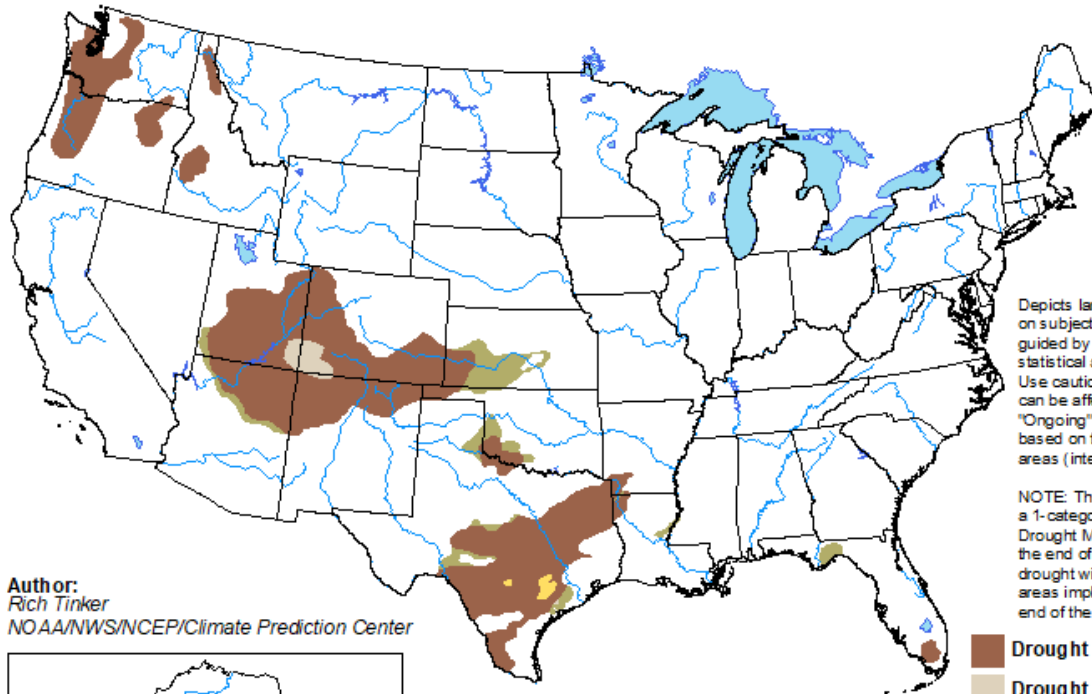


# U.S. Drought Monitor

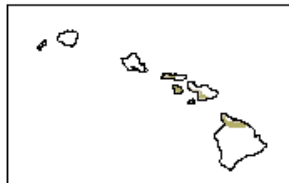
## Monthly Drought Outlook Map

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

Valid for January 2020  
Released December 31, 2019



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)

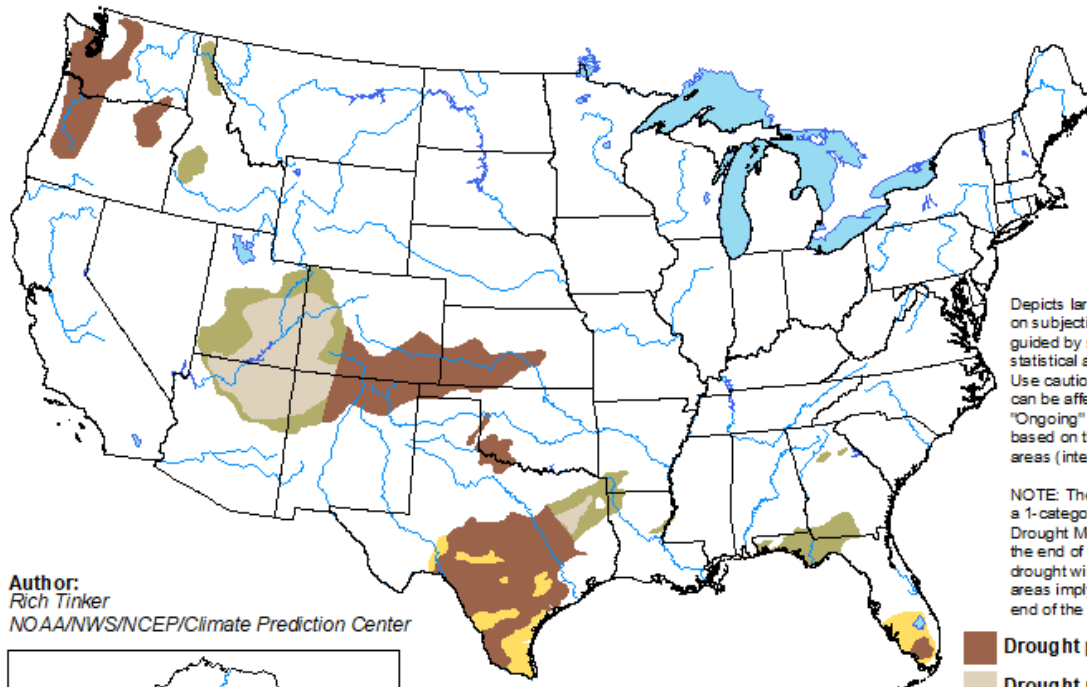


# U.S. Drought Monitor

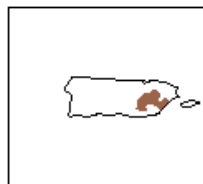
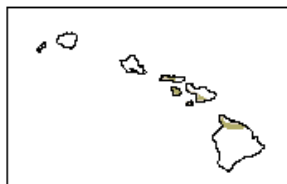
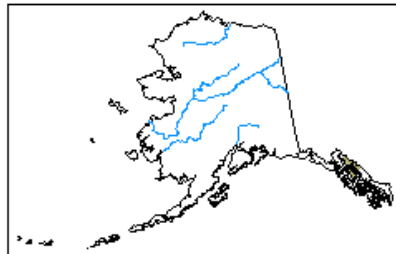
## Seasonal Drought Outlook Map

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

Valid for December 19, 2019 - March 31, 2020  
Released December 19, 2019



Author:  
Rich Tinker  
NOAA/NWS/NCEP/Climate Prediction Center



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



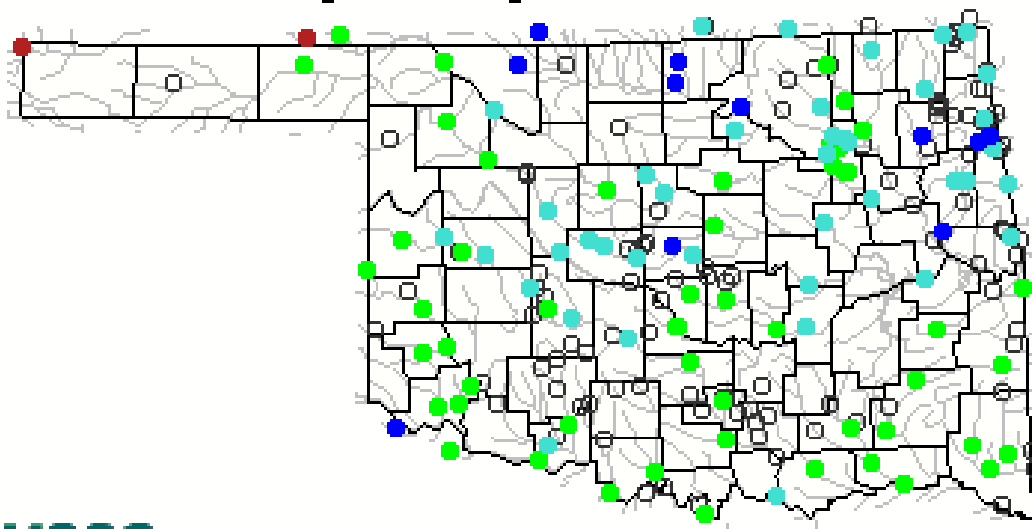
<http://go.usa.gov/3eZ73>

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



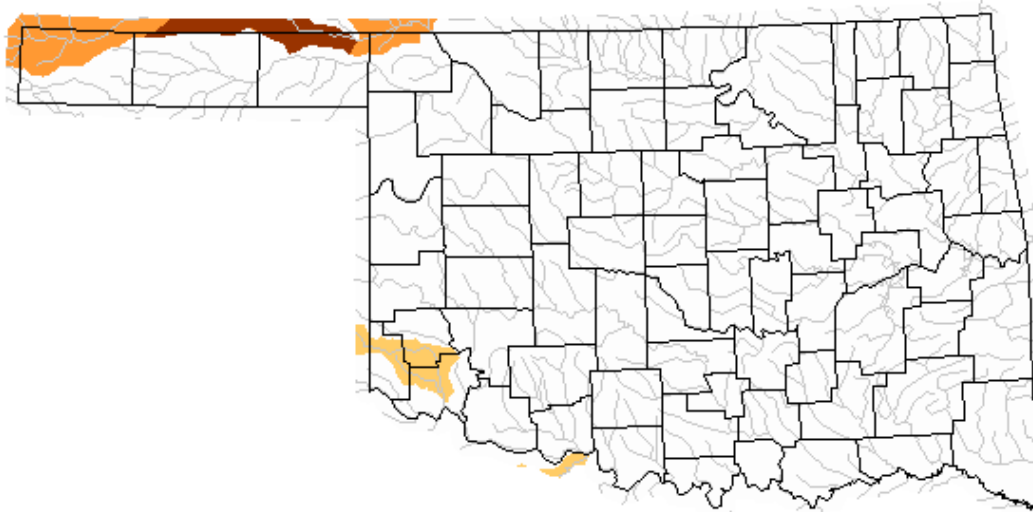
# USGS Streamflow Data

Thursday, January 02, 2020 14:30ET



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 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Wednesday, January 01, 2020



**Below normal 28-day average streamflow**

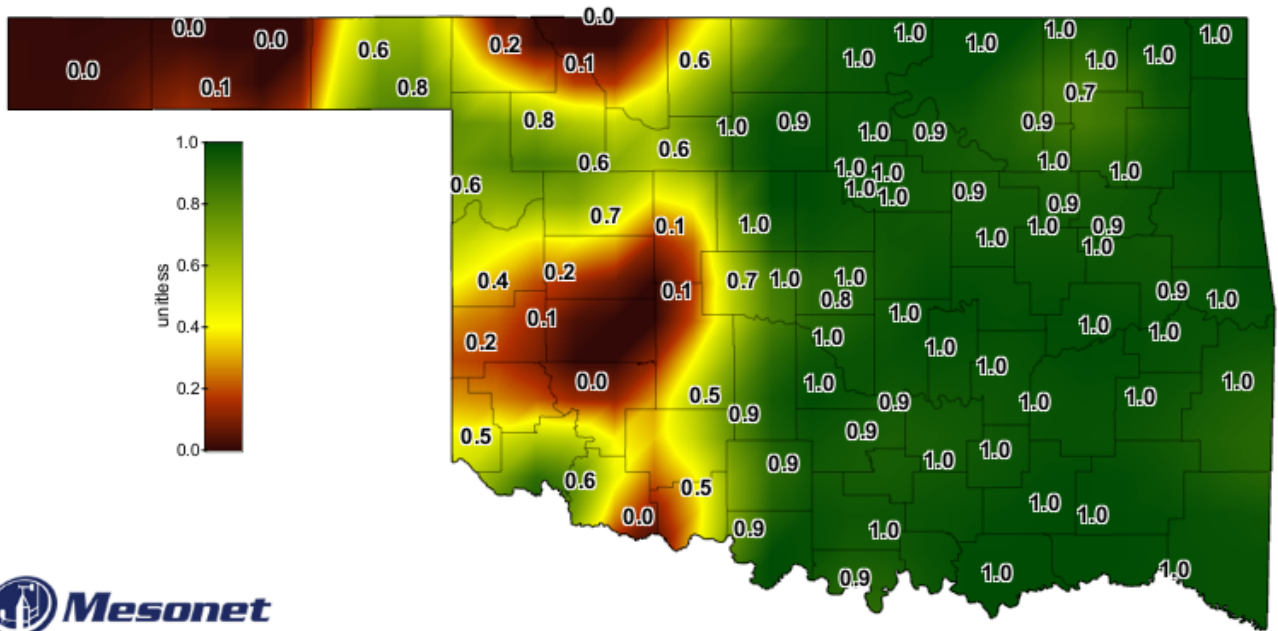
Explanation - Percentile classes				
<span style="background-color: red; color: black;">Low</span>	<span style="background-color: brown; color: black;">≤5</span>	<span style="background-color: orange; color: black;">6-9</span>	<span style="background-color: yellow; color: black;">10-24</span>	<span style="background-color: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



1-day Average 24-inch Fractional Water Index

January 1, 2020

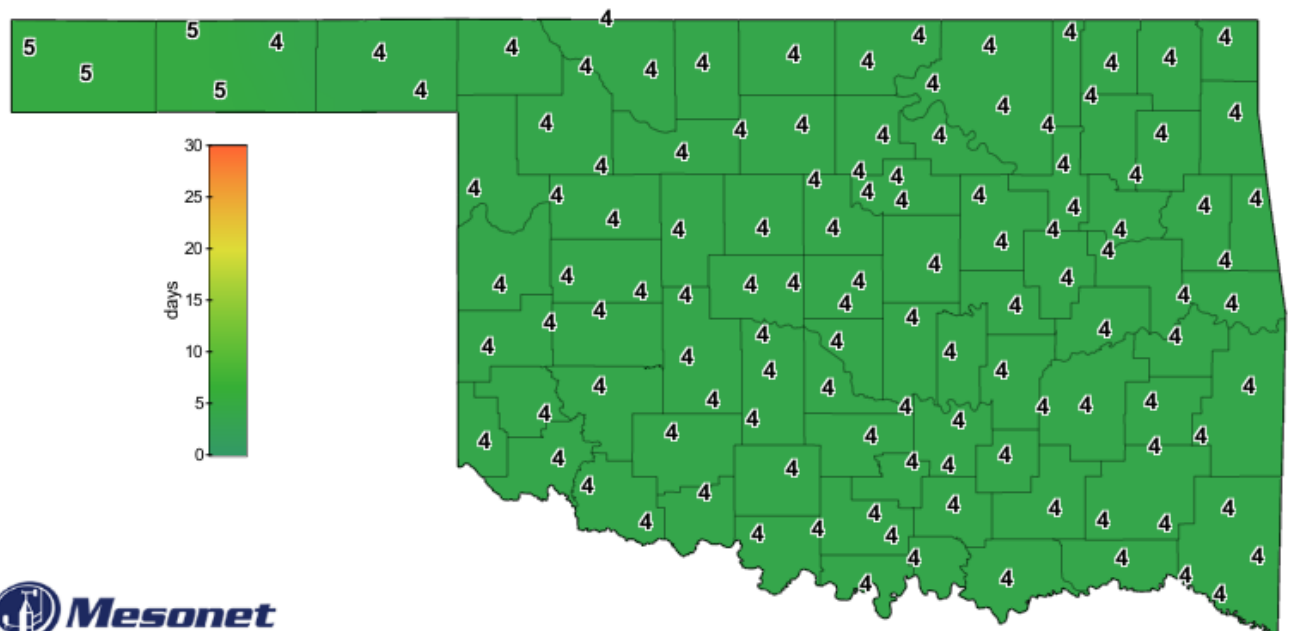
Created 6:30:13 AM January 2, 2020 CST. © Copyright 2020

- 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)



# CONSECUTIVE DAYS WITHOUT RAINFALL MAP



Consecutive Days With Less Than 0.25" Rainfall

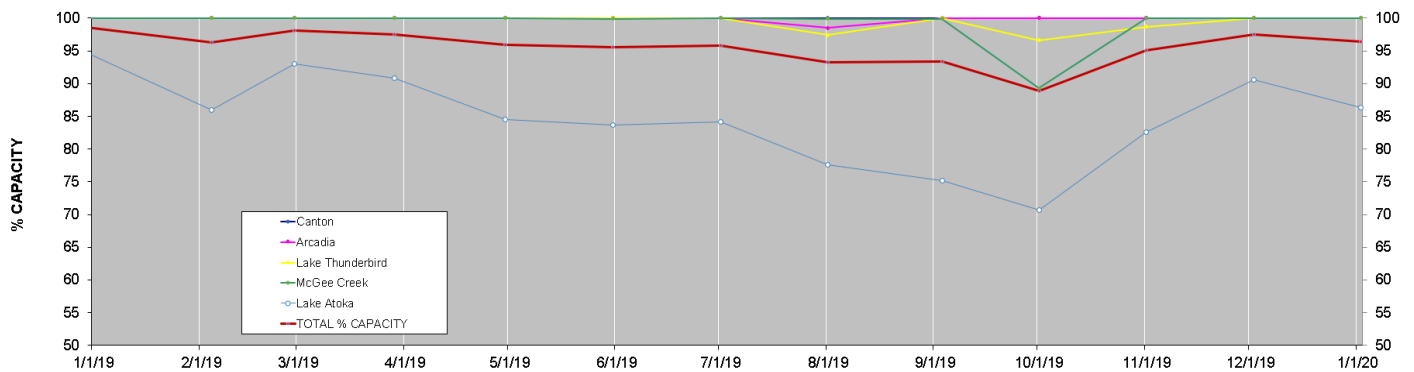
January 1, 2020

Created 7:15:02 AM January 2, 2020 CST. © Copyright 2020

[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%20days%20with%20less%20than%200.25%20inches%20Rainfall/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 12/2/2019
Canton	100.0	0.0
Arcadia	100.0	0.0
Lake Thunderbird	100.0	0.0
McGee Creek	100.0	0.0
Lake Atoka	86.4	-4.2
TOTAL % CAPACITY	96.4	-1.1

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

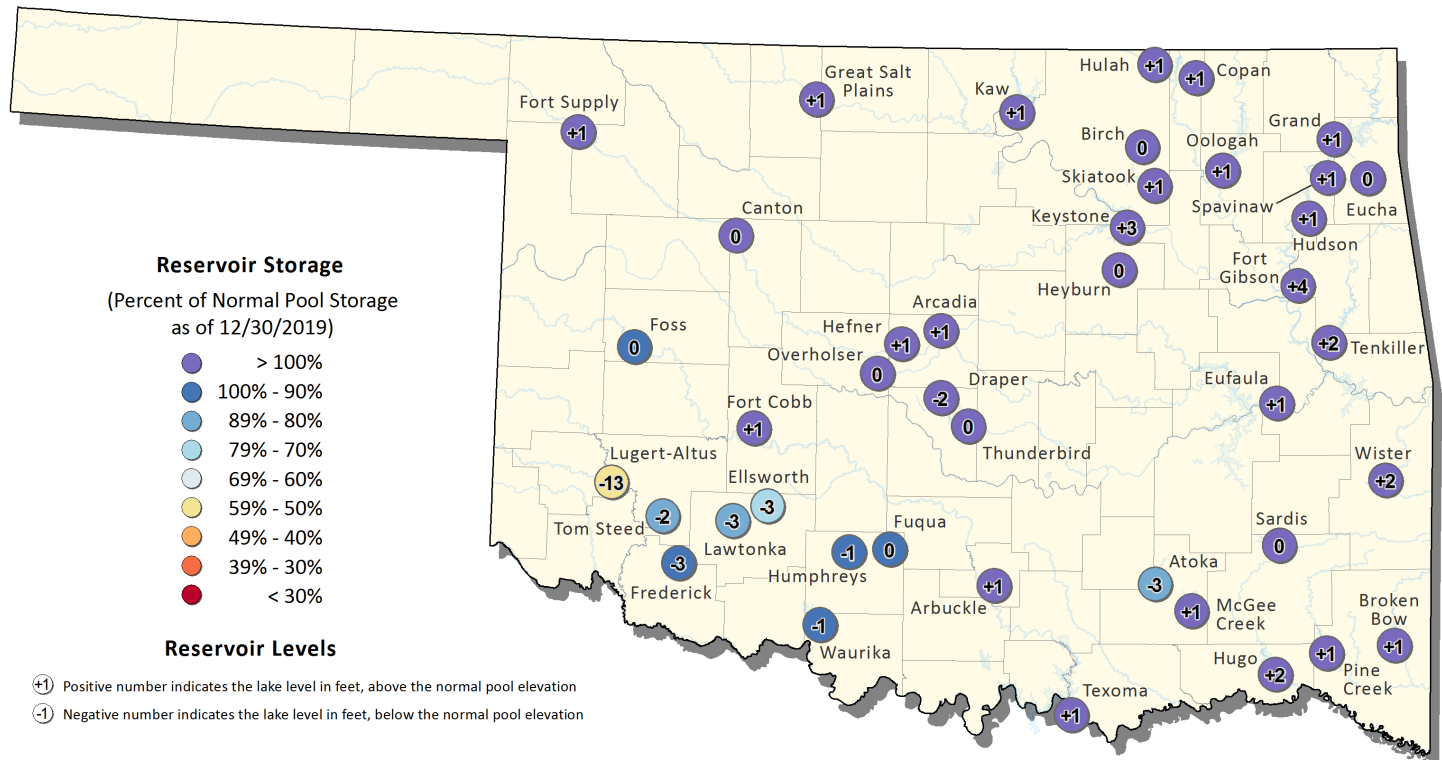
[http://waterdata.usgs.gov/ok/nwis/dv/?site\\_no=07333010&agency\\_cd=USGS&referred\\_module=sw](http://waterdata.usgs.gov/ok/nwis/dv/?site_no=07333010&agency_cd=USGS&referred_module=sw)

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.

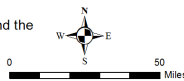


# Oklahoma Surface Water Resources

## Reservoir Levels and Storage as of 12/30/2019



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](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](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>)

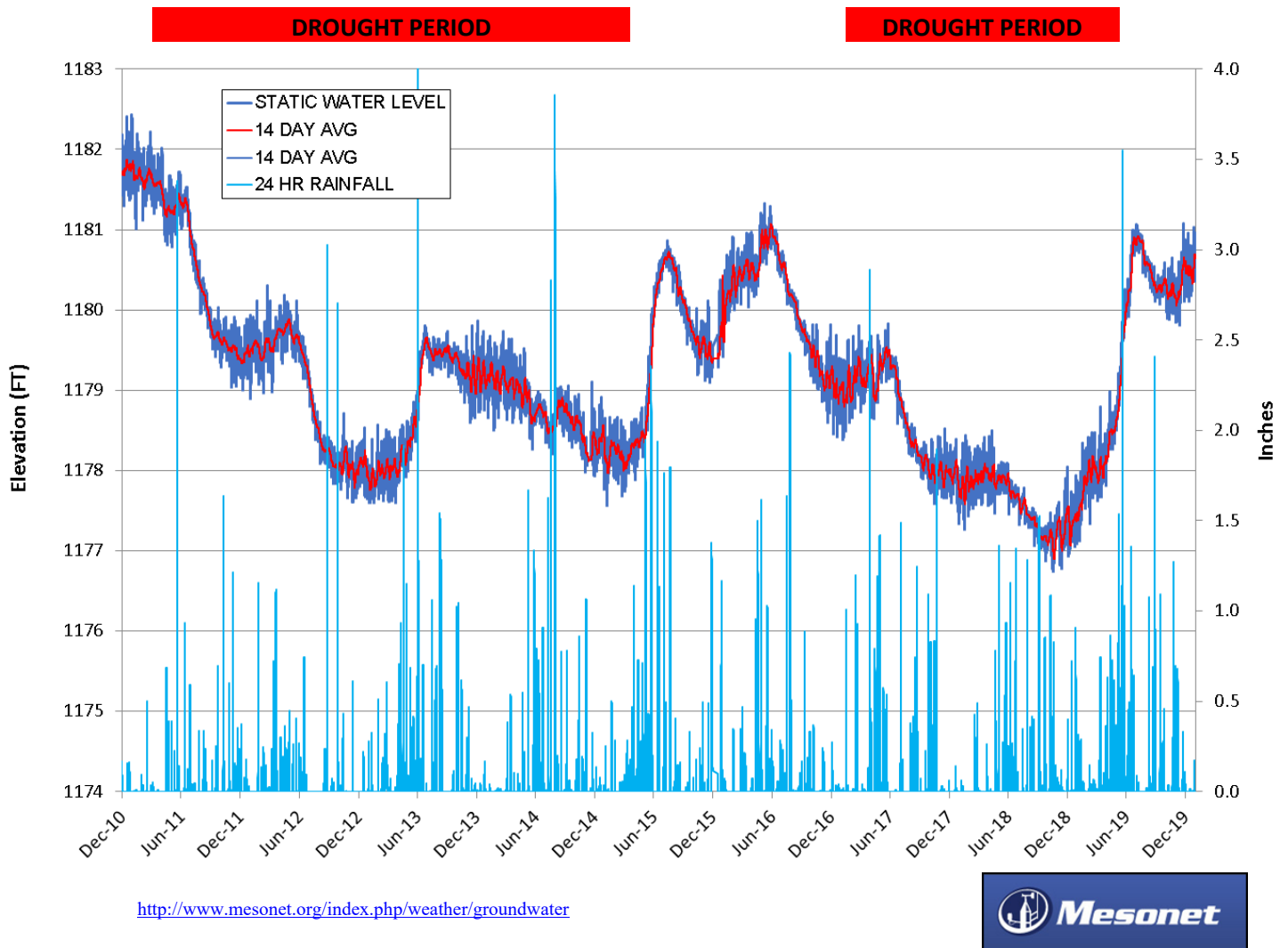


State of Oklahoma  
**OWRB**  
WATER RESOURCES BOARD  
the water agency

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



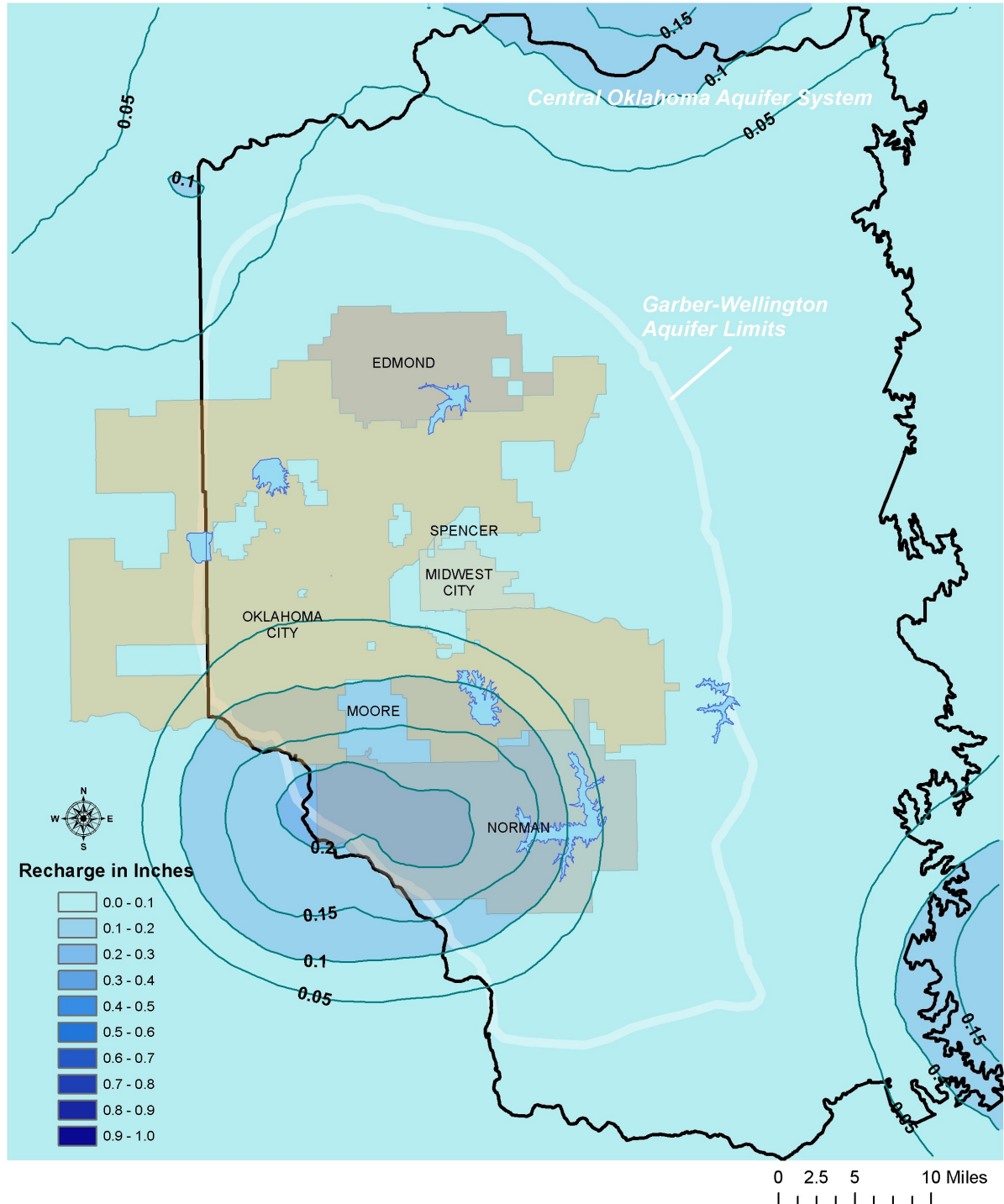
# Groundwater Levels Spencer Mesonet Station





# Recharge Map Central Oklahoma Aquifer System

## AQUIFER RECHARGE DECEMBER 2019

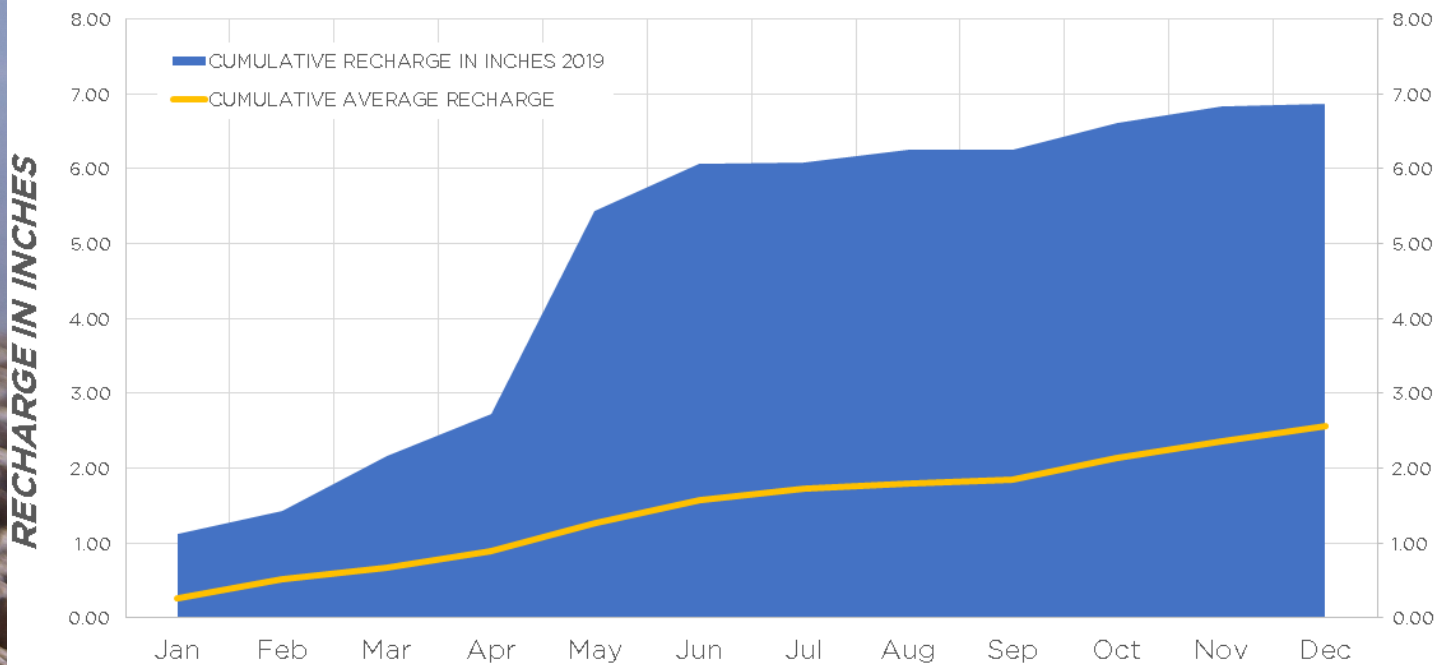




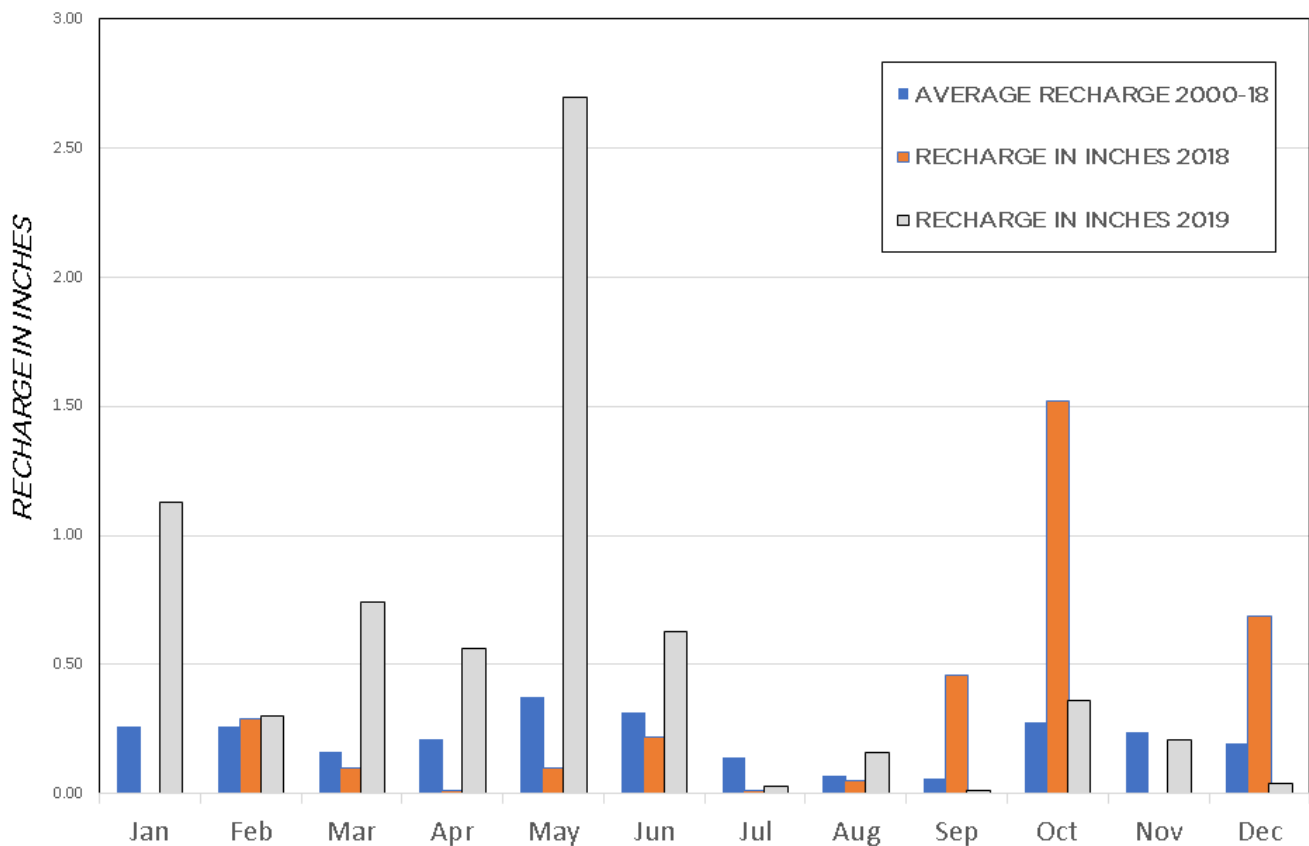
# Recharge Charts

## Central Oklahoma Aquifer System

**ACCUMULATED RECHARGE 2019**



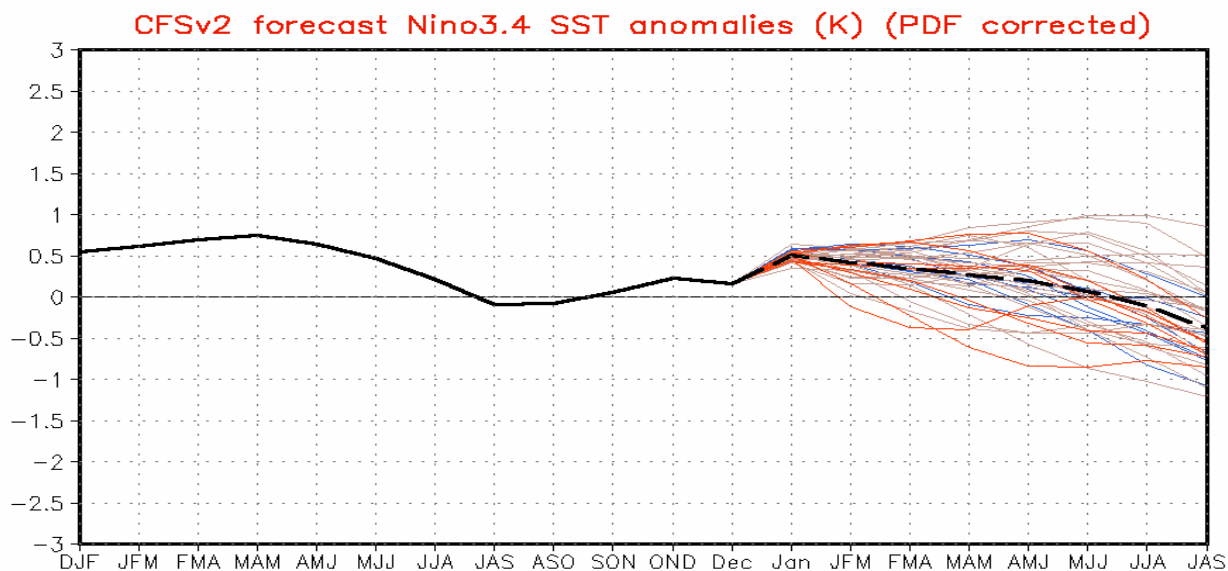
**MONTHLY AQUIFER RECHARGE**



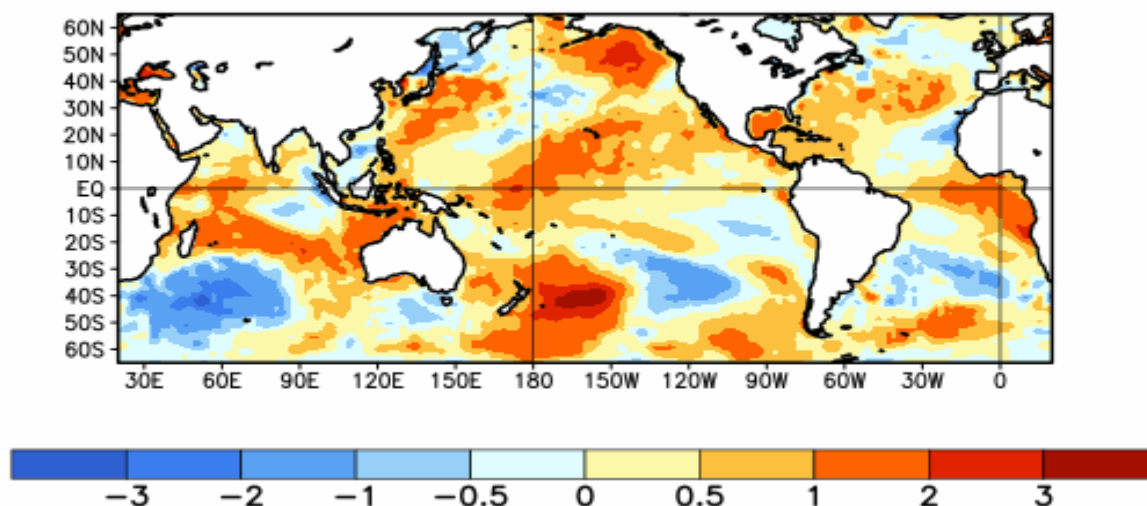


# ENSO Cycle

## Recent Evolution, Current Status and Predictions



Average SST Anomalies  
1 DEC 2019 – 28 DEC 2019



## Summary

ENSO Alert System Status: Not Active

- ENSO-neutral conditions are present.
- Equatorial sea surface temperatures (SSTs) are near-to-above average across the Pacific Ocean.
- The pattern of anomalous convection is generally consistent with ENSO-neutral.
- ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (70% chance), continuing through spring 2020 (~65% chance).