Drought Conditions in Central Oklahoma
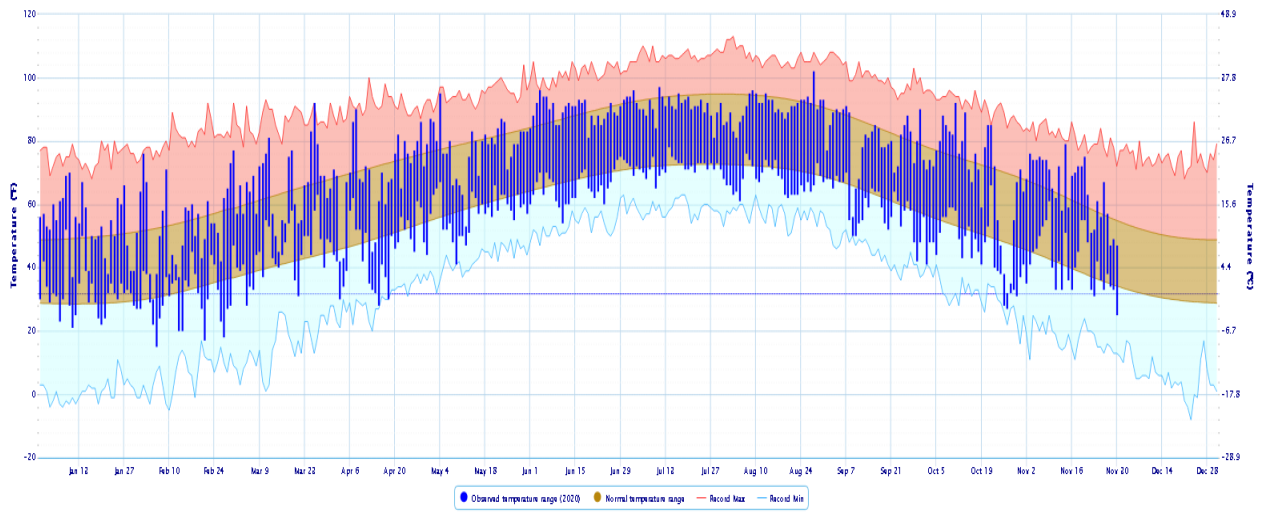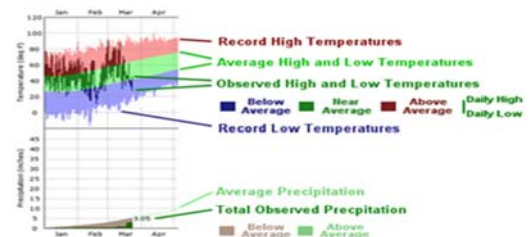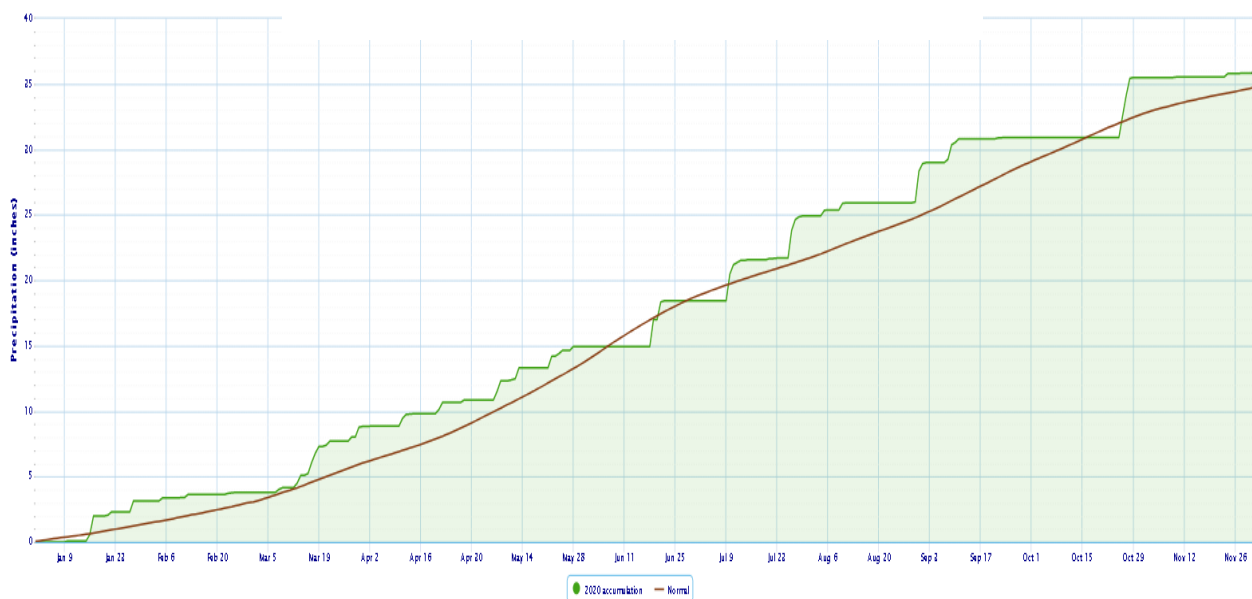
Water Resources Division
Association of Central Oklahoma Governments
December 1, 2020

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Temperature and Precipitation Plot for Oklahoma City, Oklahoma for 2020

Daily Temperature Data – Oklahoma City Area, OK

Accumulated Precipitation—Oklahoma City Area, OK

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

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Rainfall Summaries by Oklahoma Climate Division

Calendar Year 01-Jan-2020 though 30-Nov-2020

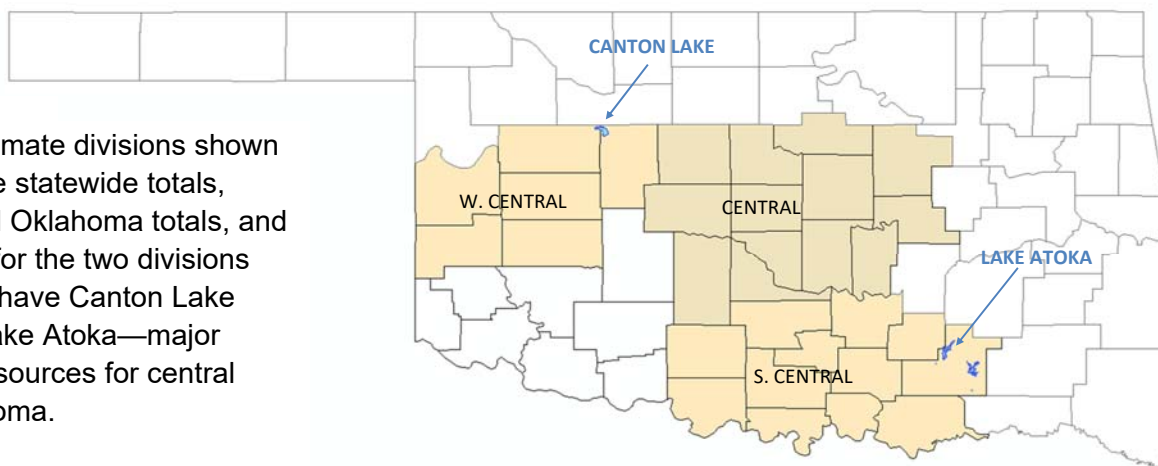| Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	19.67"	-7.51"	72%	14th driest	13.55" (1956)	40.97" (1941)
Central	35.46"	-0.18"	99%	39th wettest	17.81" (1954)	51.33" (2007)
S. Central	41.66"	+3.54"	109%	22nd wettest	18.37" (1963)	65.30" (2015)
Statewide	35.97"	+1.57"	105%	30th wettest	19.07" (1956)	48.23" (2015)

Water Year: 01-Oct-2019 through 30-Nov-2020

Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	3.06"	-1.26"	71%	48th driest	0.12" (1921)	11.29" (1986)
Central	4.98"	-1.14"	81%	48th wettest	0.65" (1921)	14.78" (1941)
S. Central	3.13"	-3.97"	44%	21st driest	0.91" (1950)	18.80" (1981)
Statewide	4.48"	-1.53"	75%	42nd driest	1.02" (1950)	12.40" (1941)

Autumn 01-Sep through 30-Nov-2020

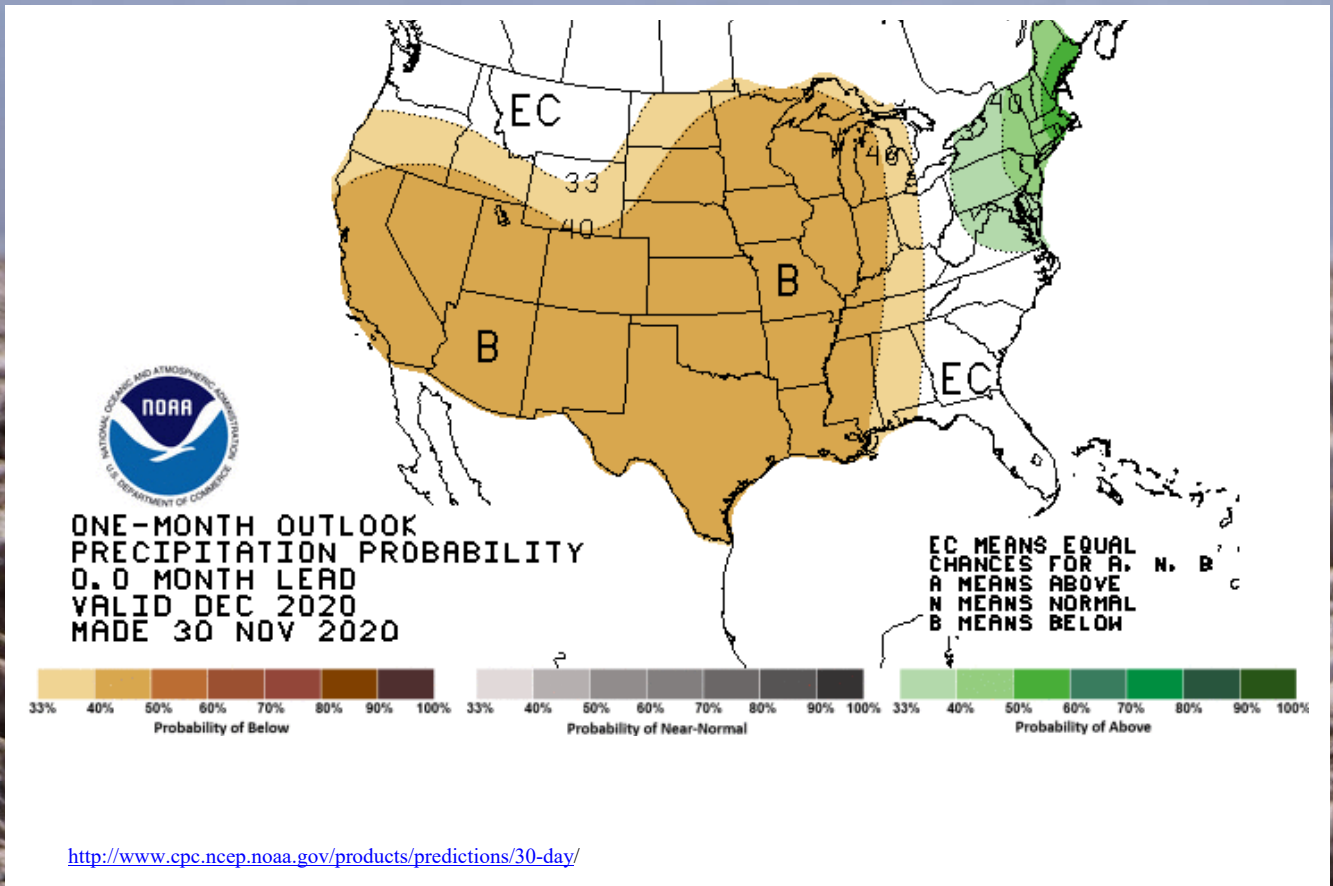| Climate Division	Total Rainfall	Departure from Normal	Pct of Normal	Rank since 1921 (88 periods)	Driest on Record	Wettest on Record
W. Central	4.97"	-2.15"	70%	32nd driest	0.87" (1954)	19.52" (1986)
Central	8.62"	-1.34"	87%	47th driest	2.29" (1948)	20.91" (1923)
S. Central	9.46"	-1.61"	85%	48th driest	2.13" (1948)	21.32" (2018)
Statewide	8.29"	-1.26"	87%	50th wettest	3.17" (1948)	18.03" (1923)

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.

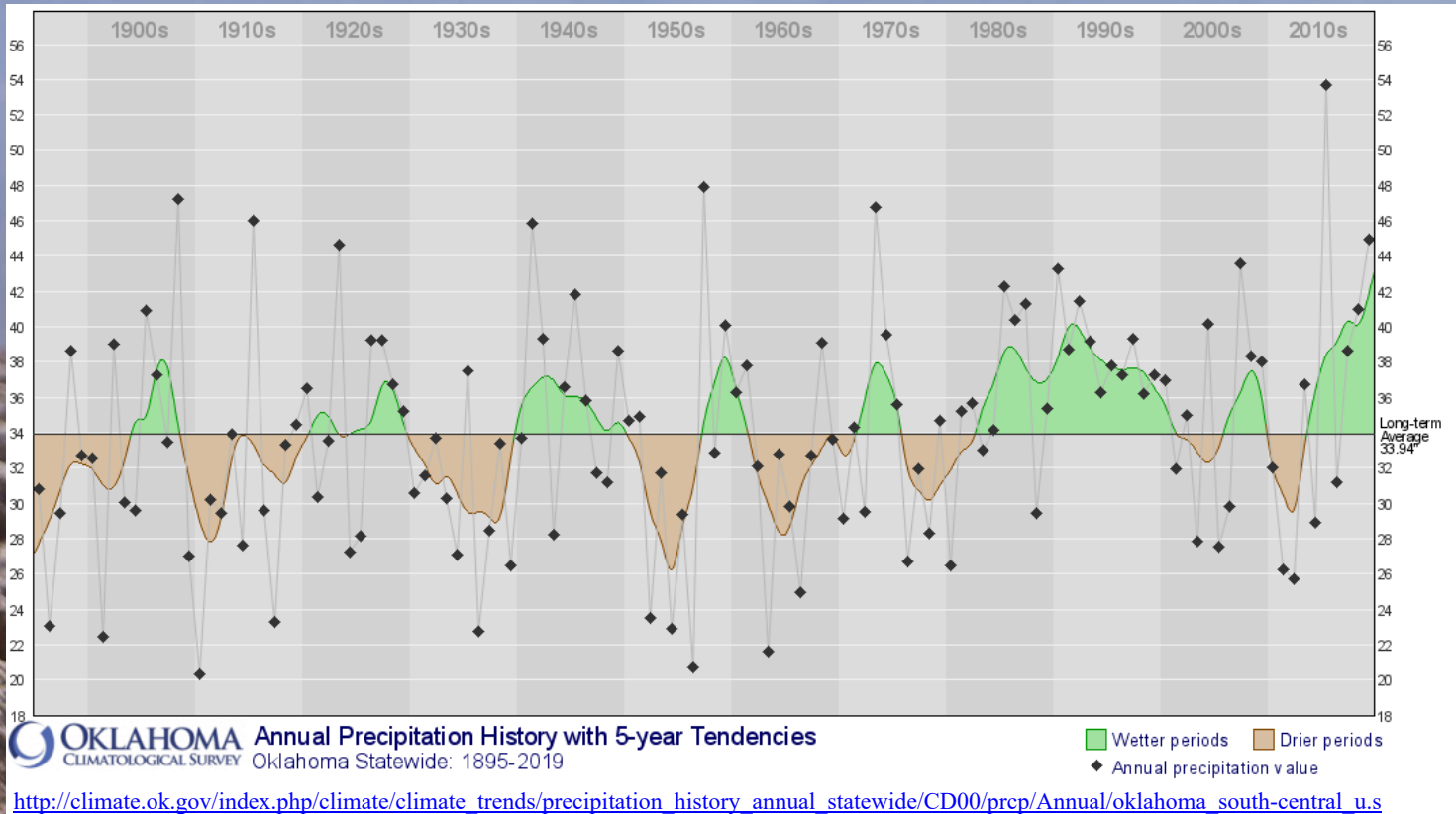http://climate.ok.gov/index.php/drought/last_30_days/

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NOAA One-Month Outlook

ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.0 MONTH LEAD
VALID DEC 2020
MADE 30 NOV 2020

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

33% 40% 50% 60% 70% 80% 90% 100%
Probability of Below

33% 40% 50% 60% 70% 80% 90% 100%
Probability of Near-Normal

33% 40% 50% 60% 70% 80% 90% 100%
Probability of Above

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: 1895-2019

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.

Drought Severity Index by Climate Division

Palmer Value Ending 28 NOV 2020

http://www.cpc.ncep.noaa.gov/products/
analysis_monitoring/cdus/palmer_drought/wpdsouth.txt
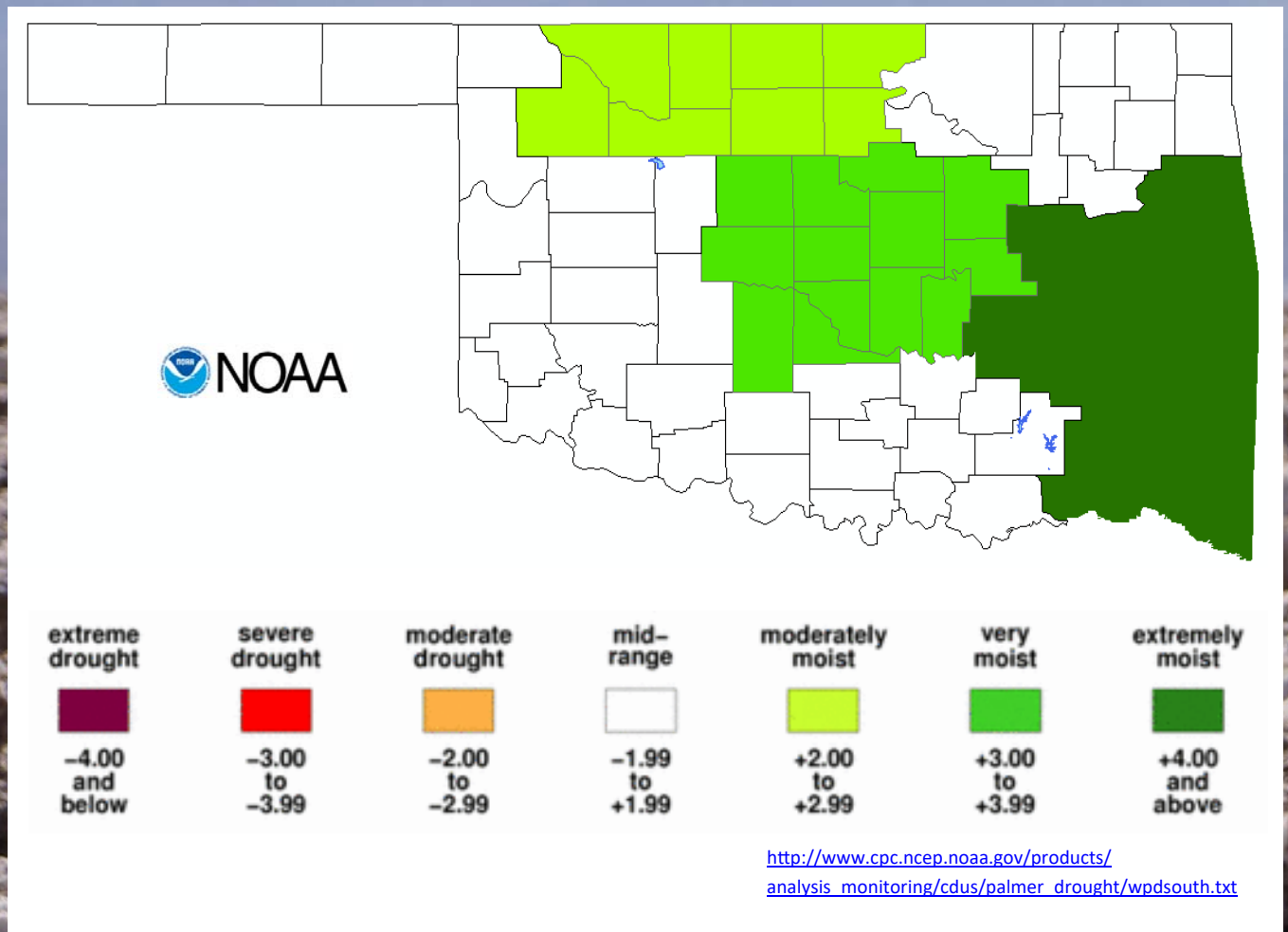
The Palmer Drought Index (PDI) maps show long-term (cumulative) meteorological drought and wet conditions. The maps show how the geographical pattern of the long-term (meteorological) moisture conditions has changed over the last 12 months.

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

U.S. Drought Monitor

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2020-11-24	42.62	57.38	25.13	7.78	1.47	0.00
Last Week	2020-11-17	46.50	53.50	22.76	7.70	1.44	0.00
3 Months Ago	2020-08-25	62.46	37.54	20.25	12.32	1.33	0.00
Start of Calendar Year	2019-12-31	76.45	23.55	10.47	3.64	0.00	0.00
Start of Water Year	2020-09-29	66.79	33.21	17.71	11.97	1.55	0.00
One Year Ago	2019-11-26	76.05	23.95	12.58	3.67	0.00	0.00

U.S. Drought Monitor
Oklahoma

Abnormal dryness or drought are currently affecting approximately 319,220 people in Oklahoma.
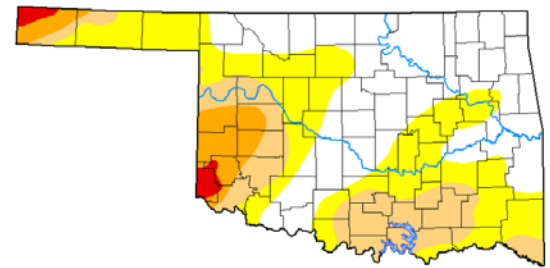
Intensity:

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: November 25, 2020
Data valid: November 24, 2020

Alaska

Aleutian Islands

Hawaii

Mariana Islands

Marshall Islands

Palau

Micronesia

American Samoa

Puerto Rico
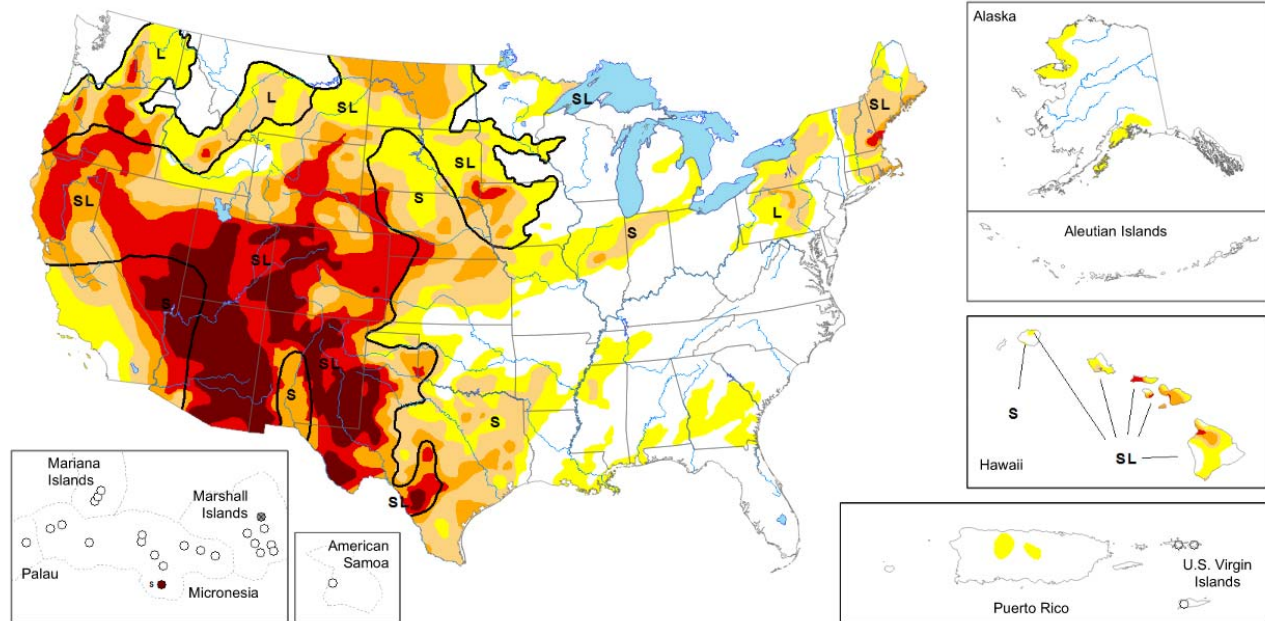
U.S. Virgin Islands

United States and Puerto Rico Author(s):
Richard Heim, NOAA/NCEI

U.S. Affiliated Pacific Islands and Virgin Islands Author(s):
Denise Gutzmer, National Drought Mitigation Center

http://droughtmonitor.unl.edu

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U.S. Drought Monitor

Monthly Drought Outlook Map

U.S. Drought Monitor

Seasonal Drought Outlook Map

USGS Streamflow Data

Tuesday, December 01, 2020 10:30ET

Explanation - Percentile classes

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

Monday, November 30, 2020
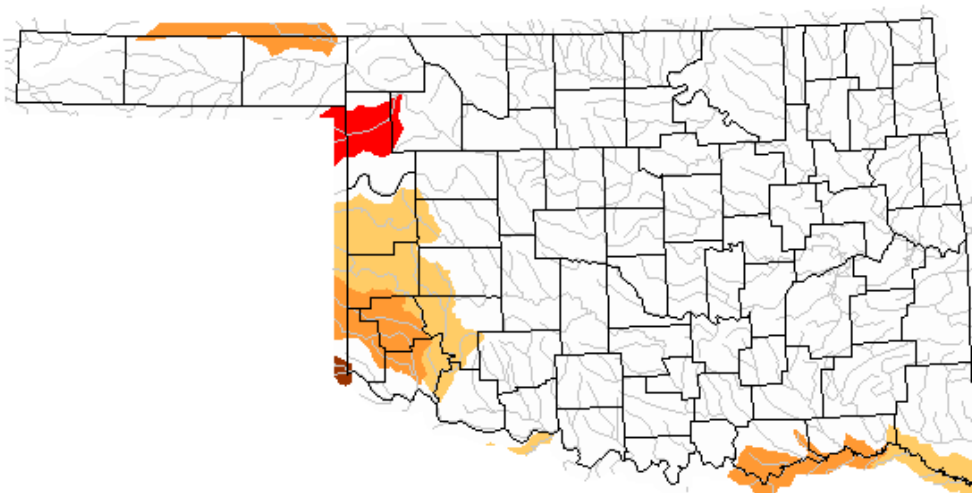
Below normal 28-day average streamflow

Explanation - Percentile classes

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

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

https://waterwatch.usgs.gov/index.php?id=pa28d_dry&sid=w__map|m__pa28d_dwc&r=ok

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SOIL MOISTURE MAP
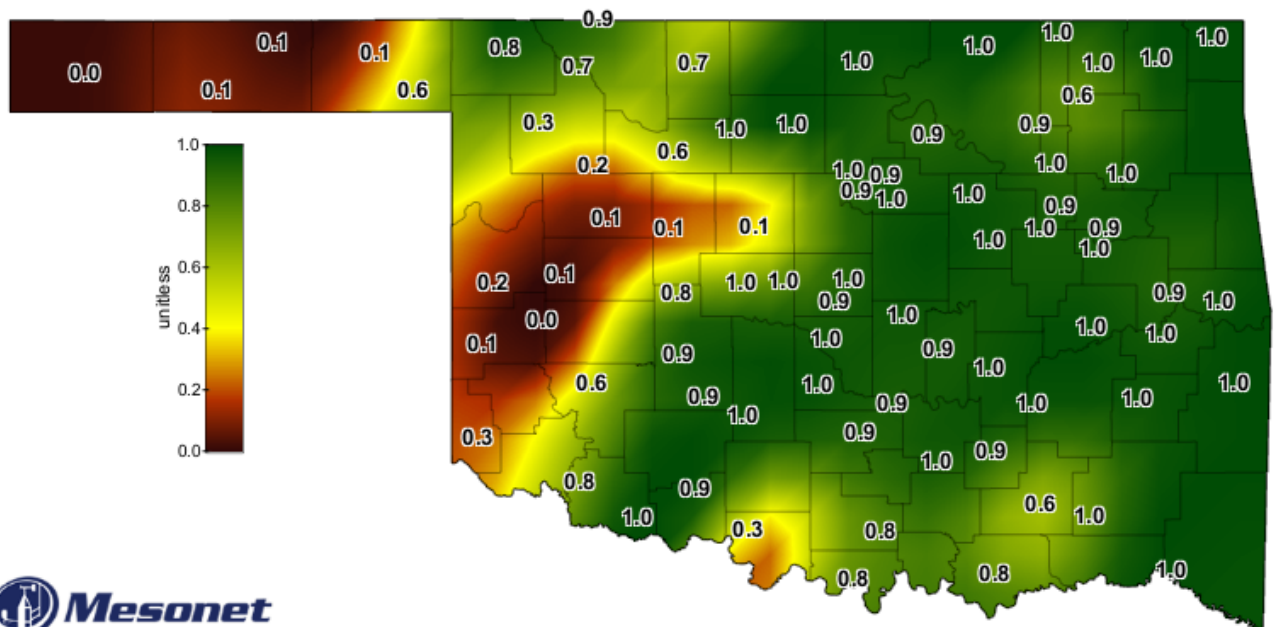
1-day Average 24-inch Fractional Water Index

Mesonet

November 30, 2020
Created 6:30:14 AM December 1, 2020 CST. © Copyright 2020

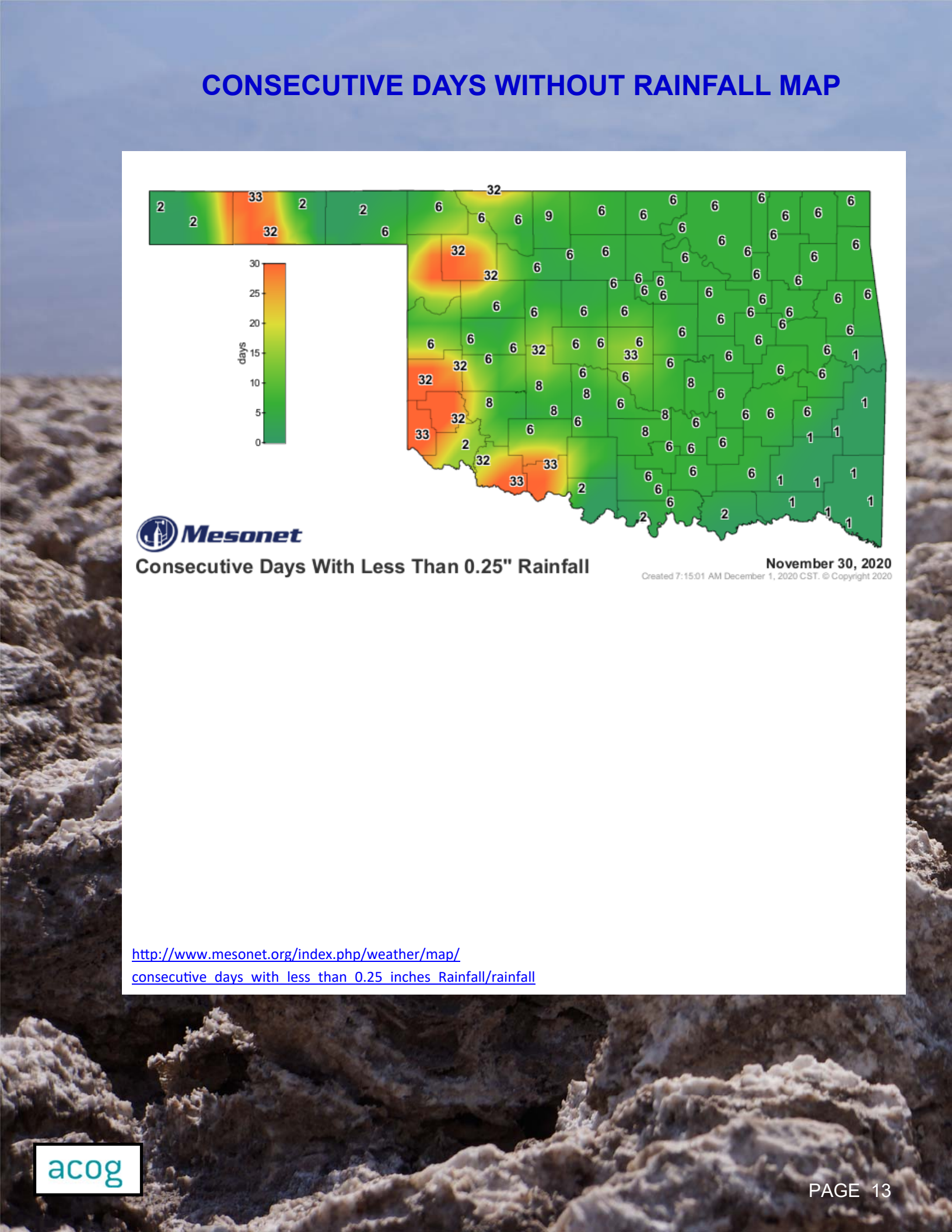|	
■	1.0 - 0.8 Enhanced Growth
■	0.8 – 0.5 Limited Growth
■	0.5 – 0.3 Plants Wilting
■	0.3 - 0.1 Plants Dying
■	< 0.1 Barren Soil

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

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CONSECUTIVE DAYS WITHOUT RAINFALL MAP

Consecutive Days With Less Than 0.25" Rainfall

November 30, 2020
Created 7:15:01 AM December 1, 2020 CST. © Copyright 2020

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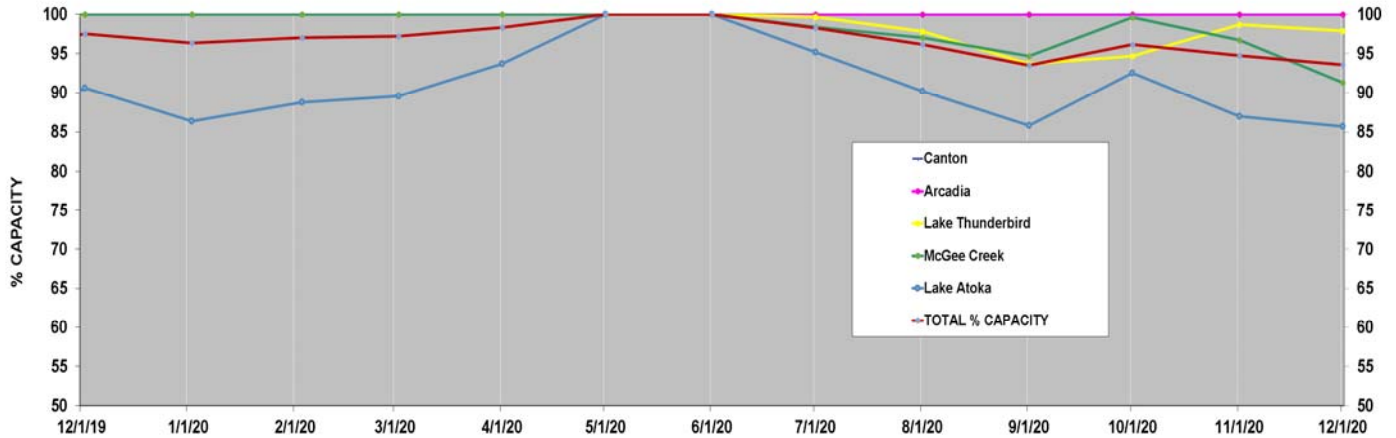consecutive_days_with_less_than_0.25_inches_Rainfall/rainfall

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 11/1/2020
Canton	99.5	2.9
Arcadia	100.0	0.0
Lake Thunderbird	97.9	-0.8
McGee Creek	91.3	-5.4
Lake Atoka	85.7	-1.3
TOTAL % CAPACITY	93.6	-1.2

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

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.
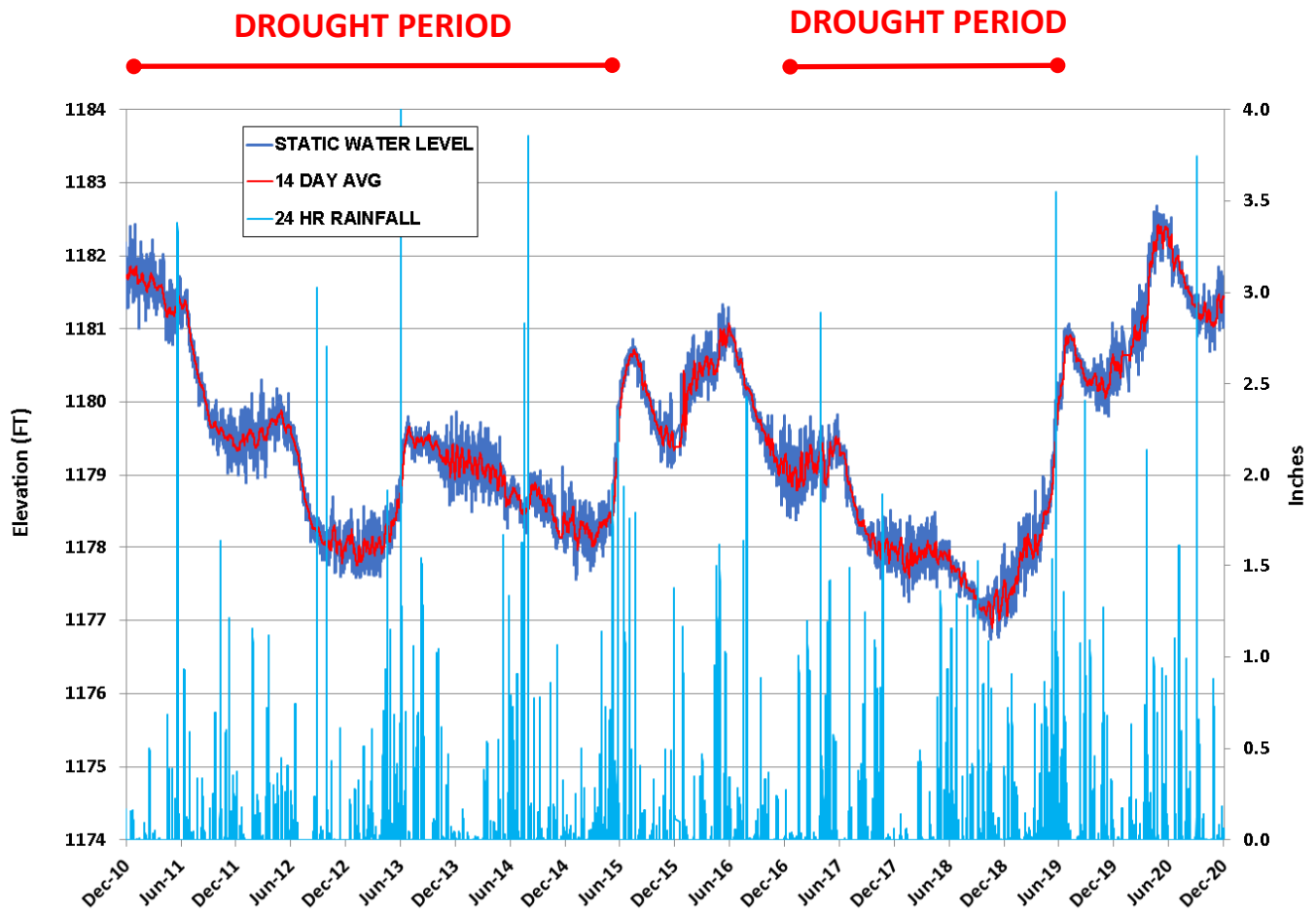
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Oklahoma Surface Water Resources
Reservoir Levels and Storage as of 11/30/2020

https://www.owrb.ok.gov/supply/drought/reservoirstorage.php
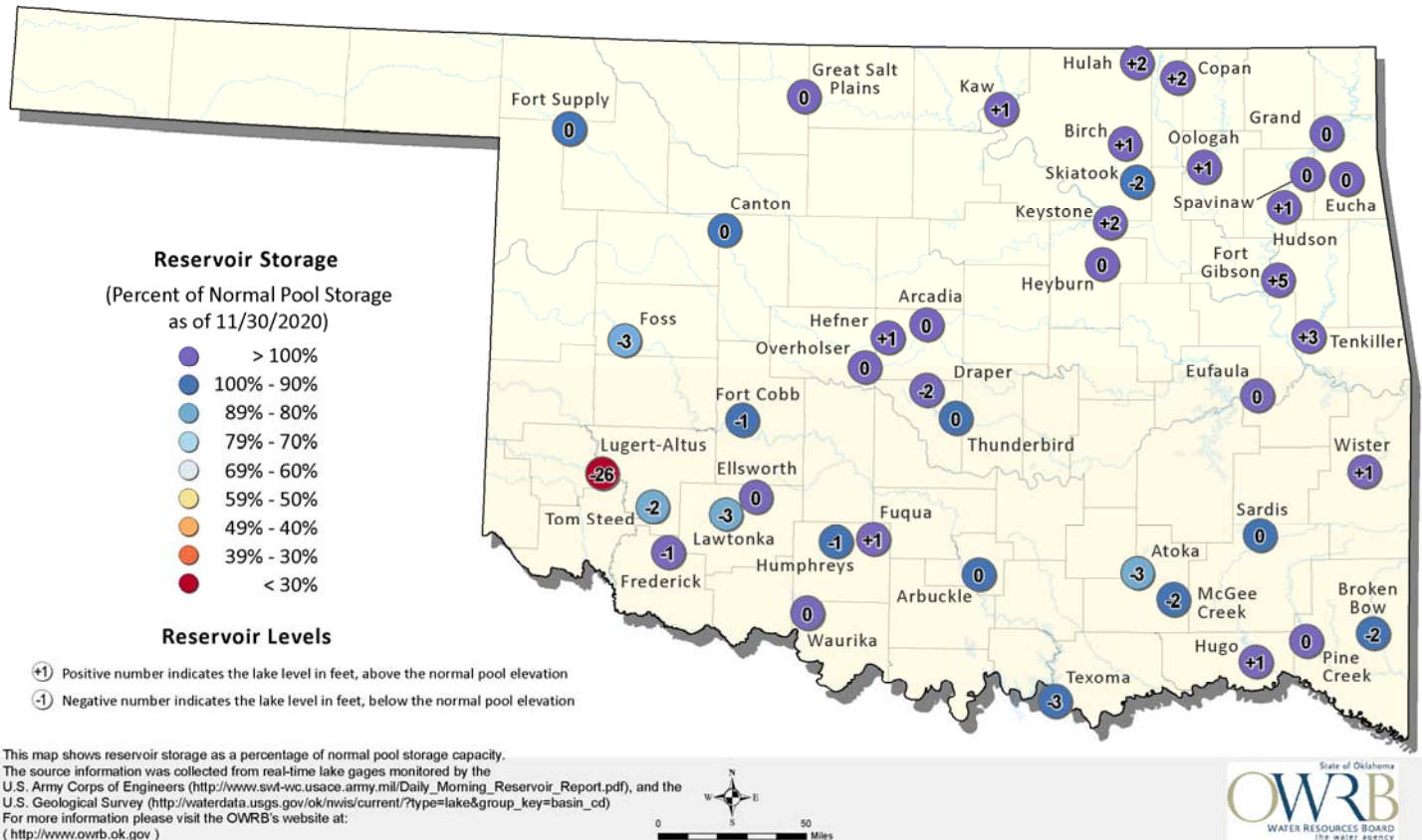
Groundwater Levels
Spencer Mesonet Station

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

Recharge Map
Central Oklahoma Aquifer System

AQUIFER RECHARGE NOV 2020

Central Oklahoma Aquifer System

Garber-Wellington Aquifer Limits

EDMOND

MIDWEST CITY

OKLAHOMA 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
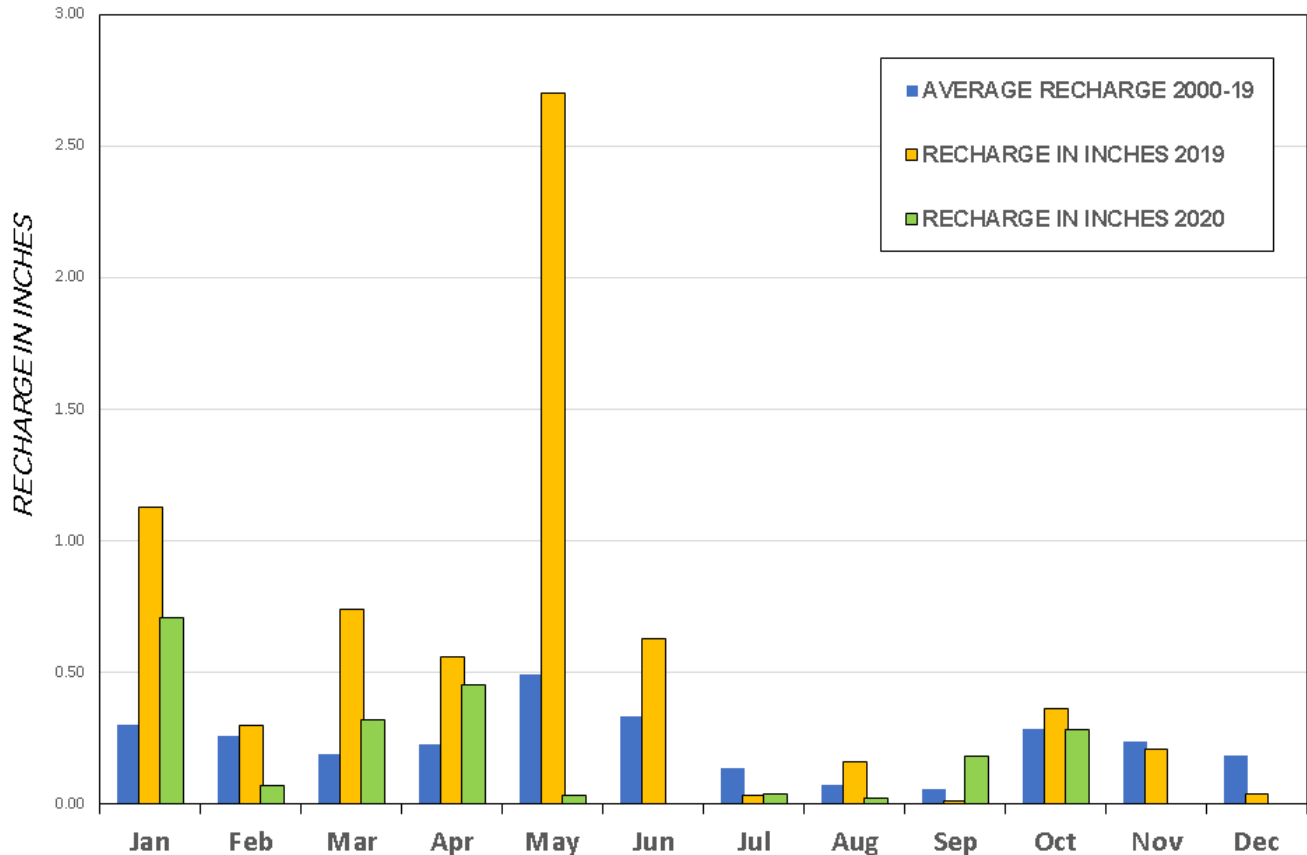
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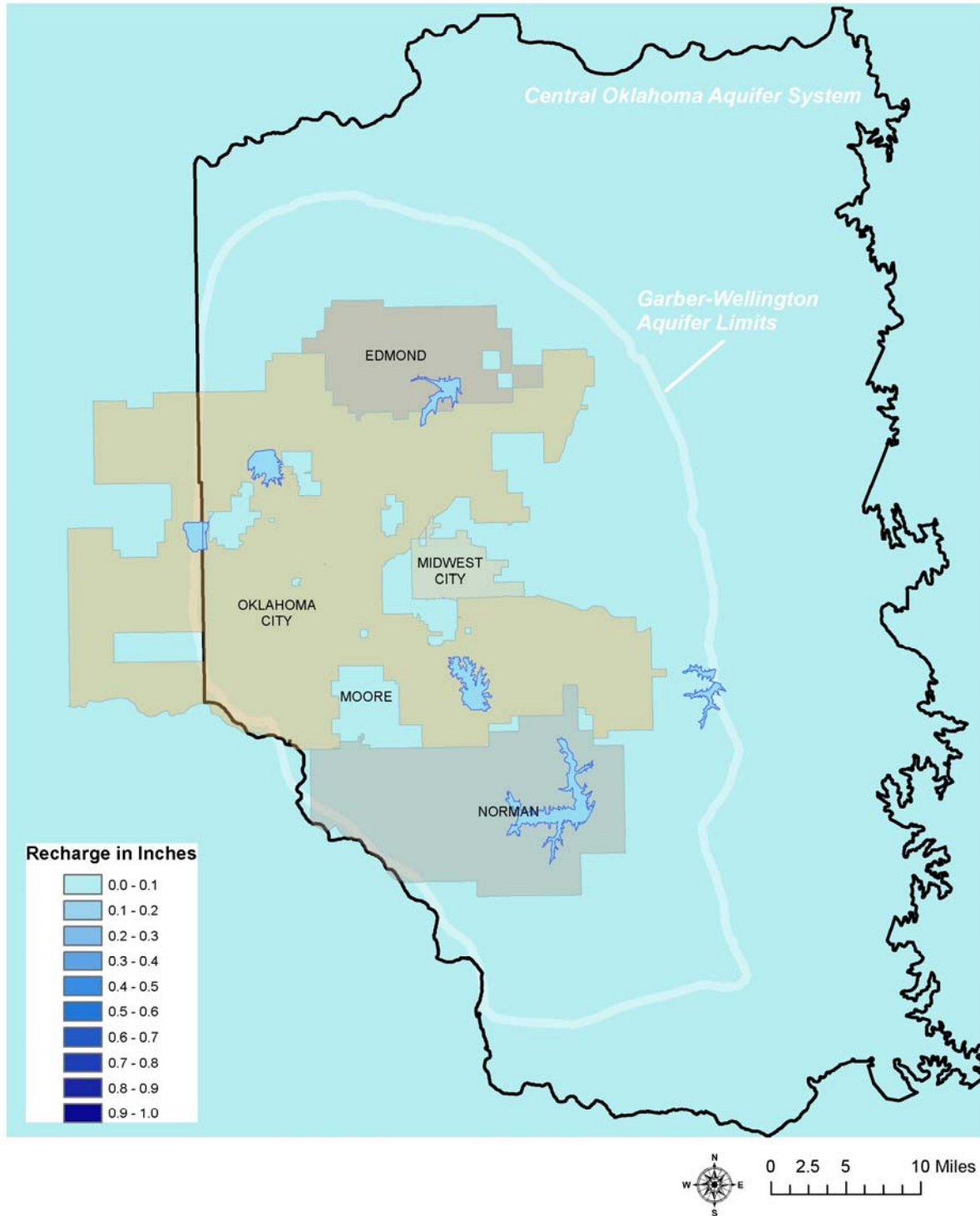
Recharge Charts
Central Oklahoma Aquifer System

ACCUMULATED RECHARGE 2020
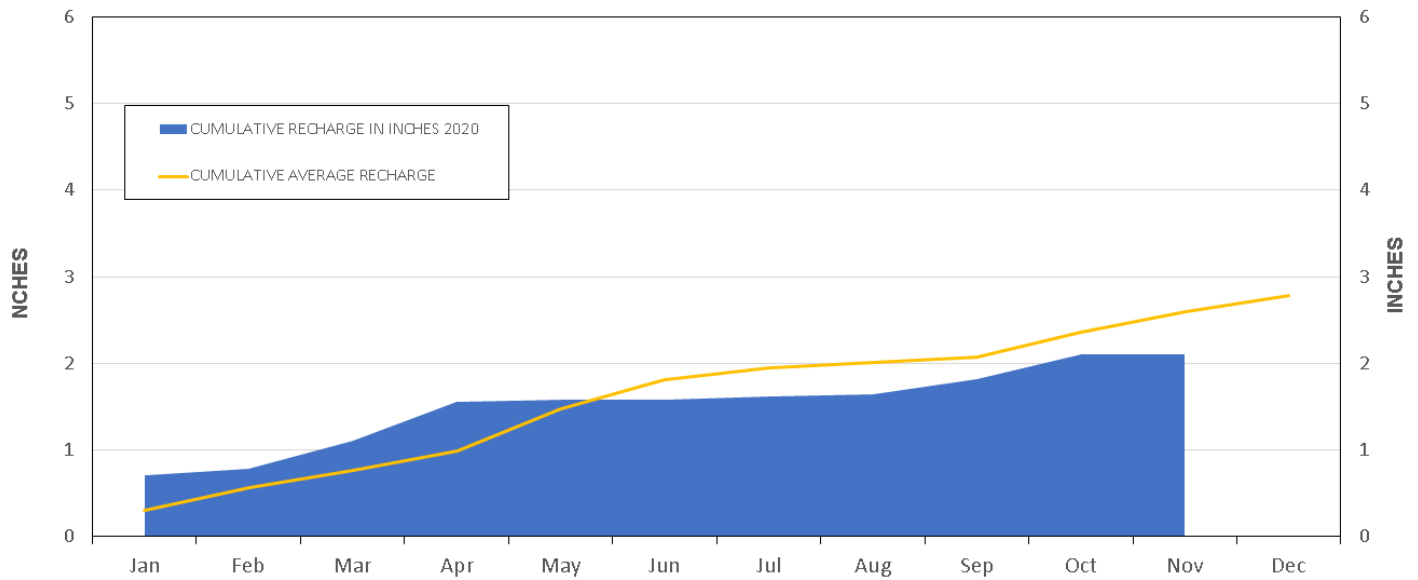
MONTHLY AQUIFER RECHARGE

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ENSO Cycle
Recent Evolution, Current Status and Predictions

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

Average SST Anomalies
1 NOV 2020 – 28 NOV 2020
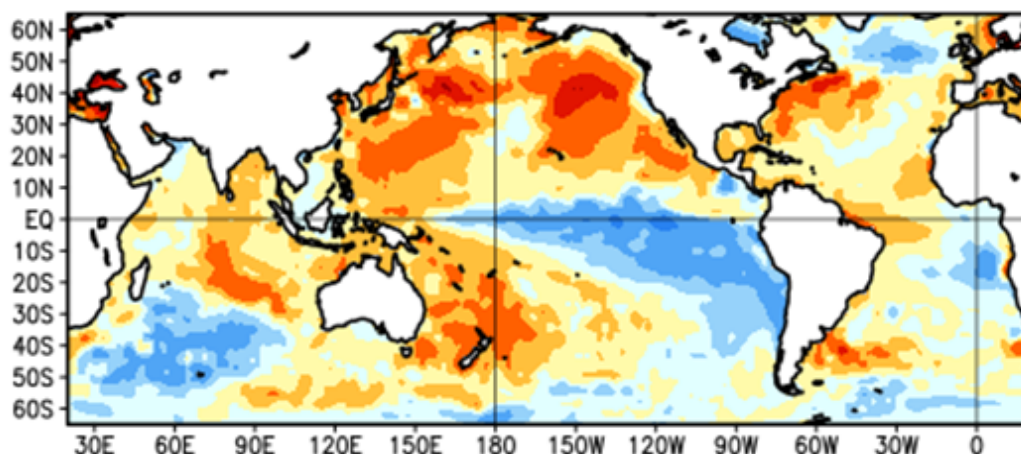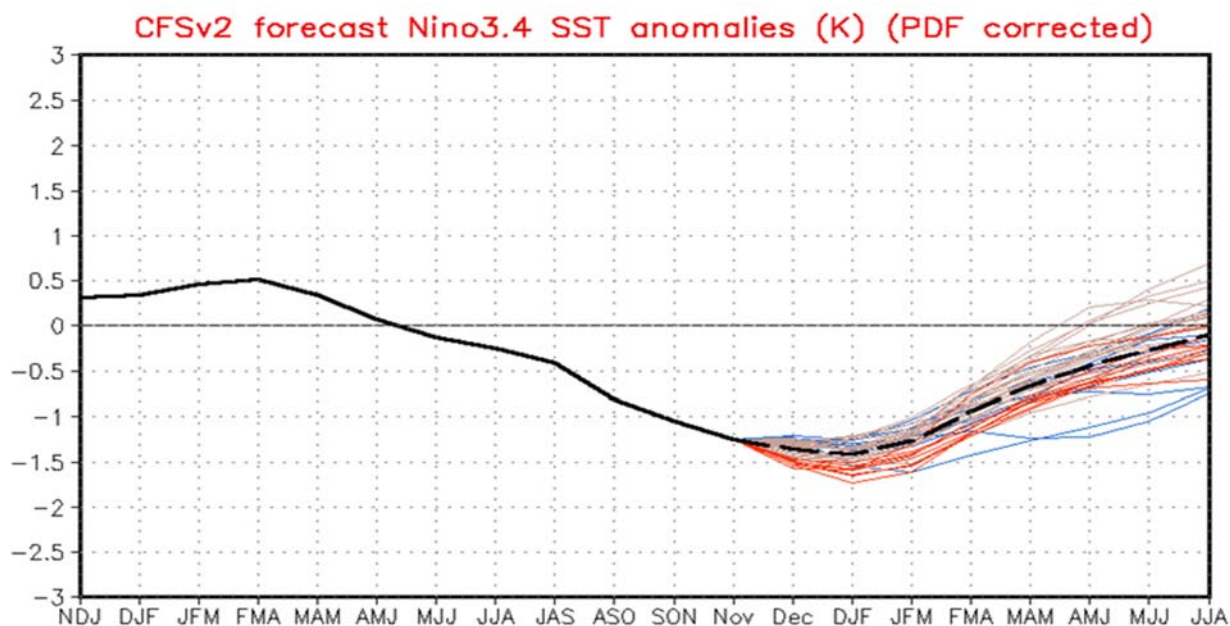
Summary

ENSO Alert System Status: La Niña Advisory

• La Niña conditions are 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.

• La Niña is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March) and into spring 2021 (~65% chance during March-May).

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

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