

The 17th warmest and driest September in Oklahoma since records began in 1895 allowed drought to flourish during the month. Categorized as “flash drought,” its rapid onset and intensification occur when abnormally high temperatures and below normal precipitation persist for an extended period. Most often a warm season phenomenon, abundant sunshine and strong winds can also aid in its progression. Those are precisely the conditions Oklahoma experienced when previously abundant rains tapered off during early August and sweltering heat returned shortly thereafter. That weather pattern continued until relief finally arrived on the month’s final two days, bringing widespread rains and more seasonable temperatures.

According to preliminary data from the Oklahoma Mesonet, the statewide average temperature finished at 76.3 degrees, 3.4 degrees above normal. Triple-digit temperatures were more common early in the month, although they occurred as late as the 20th. Buffalo’s 107 degrees on Sept. 11 led the Mesonet’s high temperature readings, with Eva and Boise City’s 38 degrees capturing the lowest temperature prize. Heat index values amongst the Mesonet’s 120 sites rose to 105 degrees or above 228 times during September, topped by Idabel’s 111 degrees on Sept. 1. The statewide average January-September temperature remained on the cool side at 62.8 degrees, 1 degree below normal and ranked as the 51st coolest on record.

According to the U.S. Drought Monitor, more than 73% of Oklahoma was experiencing drought conditions by the end of September, a 67% increase since the end of August and

The statewide average rainfall total was 1.37 inches as measured by the Mesonet, 1.95 inches below normal. Despite the late-month moisture, nearly the entire state

September 2021 Statewide Extremes

Description	Extreme	Station	Day
High Temperature	107°F	Buffalo	11
Low Temperature	38°F	Boise City, Eva	22
High Precipitation	4.58 in.	May Ranch	--
Low Precipitation	0.05 in.	Goodwell	--

the state’s highest percentage since Feb. 20, 2018. Of that 73%, 49% was considered moderate drought, 21% severe, and 3% extreme. The Drought Monitor’s intensity scale slides from moderate-severe-extreme-exceptional, with exceptional being the worst classification. Several Mesonet sites had only received a hundredth of an inch of rain for the month before relief arrived on the 29th. Tulsa had gone 80 consecutive days without at least a quarter-inch of moisture before its streak was interrupted on that same date. Reports received by the Oklahoma Climatological Survey from across the state detailed dry stock ponds, cattle receiving supplemental feed months earlier than normal, and flagging crops due to the arid conditions. The USDA reported 79% of the state’s topsoils were “short to very short” of moisture on Sept. 26, a 52% increase since the beginning of August. The late-month relief was expected to reduce Oklahoma’s drought footprint on the first U.S. Drought Monitor report of October.

September 2021 Statewide Statistics

Temperature

	Average	Depart.	Rank (1895-2021)
Month (September)	76.3°F	3.4°F	17th Warmest
Year-to-Date (Jan-Sept)	62.8°F	-1°F	51st Coolest

Precipitation

	Total	Depart.	Rank (1895-2021)
Month (September)	1.41 in.	-1.91 in.	17th Driest
Year-to-Date (Jan-Sept)	27.92 in.	-0.65 in.	54th Wettest

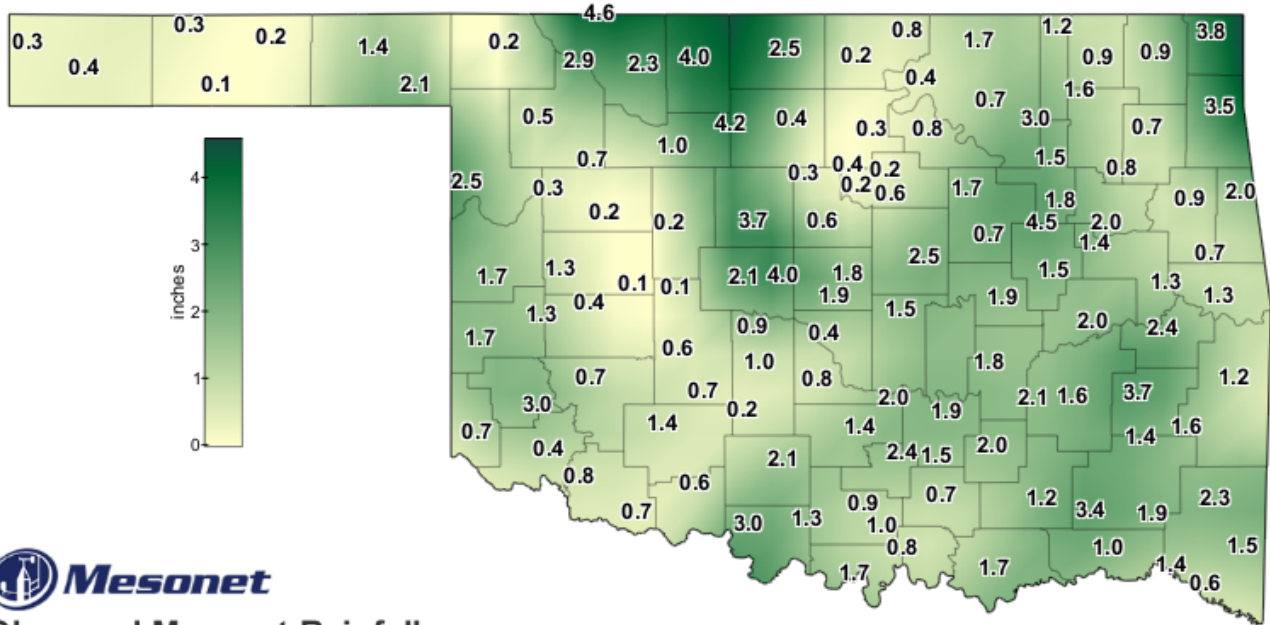
Depart. = departure from 30-year normal

suffered deficits of 1-3 inches during September. Fifty-two Mesonet sites failed to record at least an inch of rainfall, and only 29 reported at least 2 inches. The May Ranch Mesonet site in far northern Woods County recorded the highest total at 4.58 inches. Goodwell had the month’s lowest total with 0.05 inches. The January-September statewide average remained below normal by 0.68 inches at 27.92 inches, the 54th wettest such period on record.

Hope for further drought relief could arrive in October according to the outlooks from the Climate Prediction Center with increased odds of above normal temperatures

and precipitation for much of the United States, including Oklahoma. The odds for a wetter October are a bit lower for the Panhandle. CPC's October drought outlook indicates many of the areas impacted by dry conditions during September will see improvement or removal of drought by the end of October, save for the western Panhandle where drought is expected to persist or intensify.

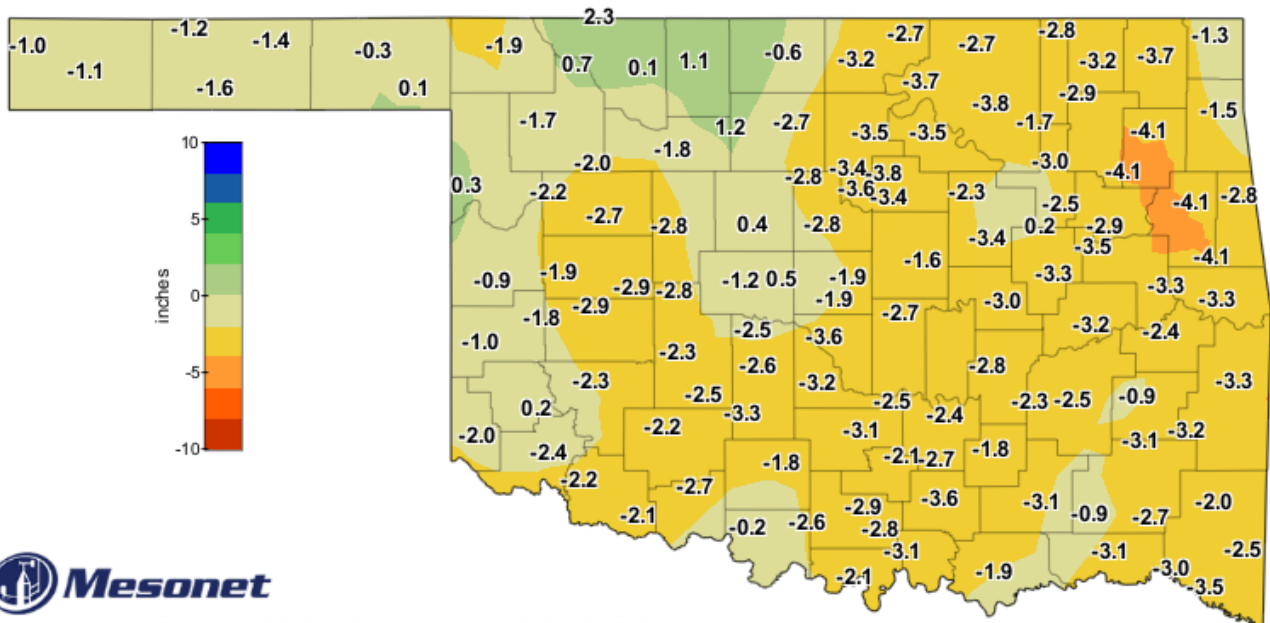
SEPTEMBER 2021 OBSERVED PRECIPITATION



Observed Mesonet Rainfall
Calendar Month to Date

Sep 1, 2021 through Sep 30, 2021
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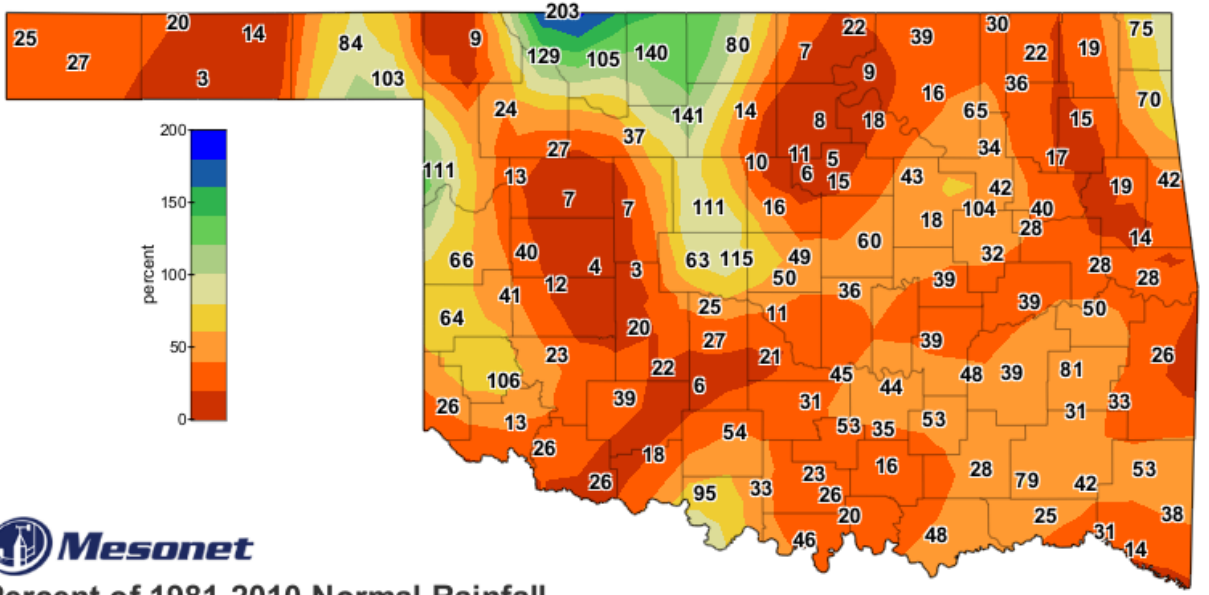
SEPTEMBER 2021 DEPARTURE FROM NORMAL PRECIPITATION



Departure from 1981-2010 Normal Rainfall
Calendar Month to Date

Sep 1, 2021 through Sep 30, 2021
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SEPTEMBER 2021 PERCENT OF NORMAL PRECIPITATION



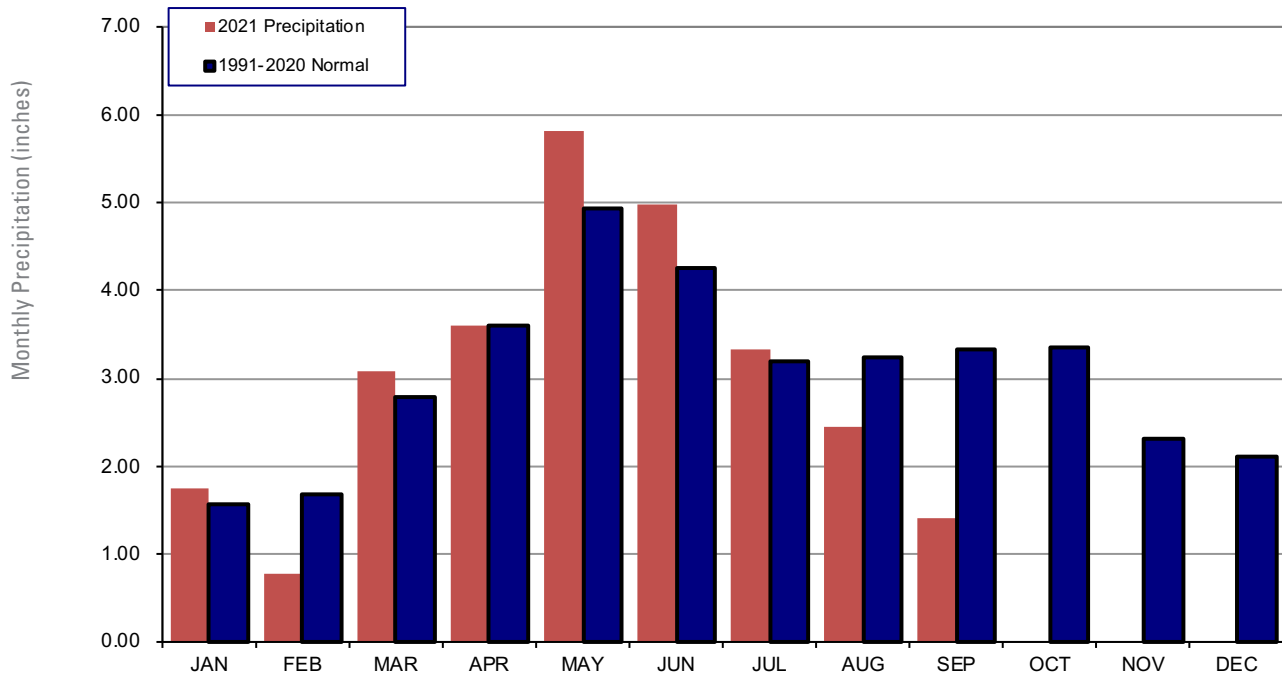
Percent of 1981-2010 Normal Rainfall
Calendar Month to Date

Sep 1, 2021 through Sep 30, 2021
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MESONET MONTHLY SUMMARY FOR SEPTEMBER 2021

PANHANDLE																																
NAME	MEAN TEMP	HIGH TEMP	LOW TEMP	DAY	DAY	HDD	CDD	TOT PPT	HIGH 24-HR	DAY	NAME	MEAN TEMP	HIGH TEMP	LOW TEMP	DAY	DAY	HDD	CDD	TOT PPT	HIGH 24-HR	DAY											
PANHANDLE																																
Arnett	75.7	104	11	44	22	5	325	2.48	1.67	17	Goodwell	74.3	104	11	41	22	14	291	.05	.02	3											
Beaver	77.4	104	11	39	22	****	****	1.41	1.34	3	Hooker	75.4	106	11	42	22	****	****	.23	.11	14											
Boise City	71.8	103	11	38	22	18	223	.41	.20	2	Kenton	72.4	103	11	40	22	20	240	.34	.22	5											
Buffalo	78.3	107	11	44	22	4	403	.19	.09	3	Slapout	76.1	105	11	45	22	6	339	2.11	.94	17											
Eva	72.3	106	11	38	22	23	243	.30	.14	2																						
NORTH CENTRAL																																
Alva	77.7	103	11	44	22	5	387	2.25	.97	3	May Ranch	76.7	103	11	49	22	2	354	4.58	1.86	30											
Blackwell	76.0	99	7	41	22	6	336	.24	.16	30	Medford	77.0	101	1	44	22	5	364	2.52	1.82	3											
Breckinridge	77.4	101	1	45	22	3	374	.43	.31	30	Newkirk	76.2	98	1	46	22	4	340	.75	.60	3											
Cherokee	77.9	102	1	46	23	2	389	3.96	2.76	30	Red Rock	77.3	100	1	45	22	2	370	.30	.17	30											
Fairview	78.9	102	7	49	25	0	418	1.02	.52	7	Seiling	77.0	100	7	39	22	9	368	.71	.33	15											
Freedom	77.1	104	11	42	22	5	369	2.89	1.69	15	Woodward	77.6	103	11	42	22	6	384	.53	.30	3											
Lahoma	77.2	102	7	46	22	2	368	4.16	3.96	30																						
NORTHEAST																																
Bixby	76.2	97	20	44	23	4	341	1.84	.87	5	Pawnee	77.5	99	1	46	22	3	377	.79	.51	30											
Burbank	75.7	98	1	43	23	4	326	.37	.33	30	Porter	76.4	97	1	44	23	2	345	1.96	.65	4											
Copan	76.3	98	20	44	23	5	344	1.19	.47	29	Pryor	75.3	97	1	42	23	6	314	.71	.32	20											
Foraker	75.1	97	20	47	23	3	305	1.73	1.43	30	Skiatook	77.7	97	20	51	23	0	380	3.04	1.08	30											
Inola	75.8	99	1	42	23	6	329	.81	.60	29	Talala	76.6	98	1	46	23	2	351	1.58	1.04	30											
Jay	75.3	96	4	45	23	11	321	3.48	1.85	30	Tulsa	79.0	99	1	49	23	0	420	1.49	1.03	30											
Miami	74.9	94	3	44	23	8	306	3.78	1.78	15	Vinita	74.8	96	20	43	23	6	300	.88	.75	21											
Nowata	75.5	98	1	42	23	6	320	.89	.64	21	Wynona	76.9	98	1	46	23	0	359	.72	.54	30											
WEST CENTRAL																																
Bessie	77.3	99	1	47	22	2	369	.41	.20	15	Erick	76.7	101	1	43	22	3	353	1.72	1.07	28											
Butler	77.2	101	3	42	22	4	371	1.28	1.20	15	Putnam	77.2	98	3	46	22	2	370	.20	.17	15											
Camargo	75.7	100	7	40	22	6	327	.34	.13	3	Watonga	78.2	99	7	50	22	0	397	.21	.14	7											
Cheyenne	76.9	98	7	49	22	1	360	1.74	1.45	15	Weatherford	78.1	99	7	48	22	1	394	.13	.10	15											
Elk City	77.3	101	3	50	22	0	369	1.27	.48	15																						
CENTRAL																																
Acme	76.8	100	20	41	22	5	357	.22	.15	30	Norman	77.2	98	1	48	22	****	****	.43	.36	30											
Bristow	75.1	99	1	40	23	6	309	.73	.37	30	Oilton	76.6	98	1	42	23	7	355	1.69	1.61	30											
Lake Carl Blac	75.4	98	20	41	23	6	318	.41	.38	30	OKC East	77.8	99	3	49	23	0	384	1.92	1.15	4											
Chandler	77.1	98	20	46	22	2	366	2.48	1.59	30	Okemah	76.7	100	1	43	23	3	354	1.92	1.71	30											
Chickasha	76.0	100	20	43	23	4	335	.96	.84	30	Perkins	77.3	98	3	45	22	2	370	.60	.49	30											
El Reno	****	***	***	***	***	****	****	2.07	2.07	30	Seminole	76.6	99	4	44	23	1	350	2.01	1.67	30											
Guthrie	78.5	100	1	45	22	3	407	.55	.55	30	Shawnee	78.0	100	1	48	23	0	390	1.51	1.00	30											
Kingfisher	77.9	101	1	45	22	****	****	3.69	3.68	30	Spencer	77.9	99	1	46	22	3	390	1.82	1.57	4											
Marena	77.0	98	3	48	23	1	361	.22	.21	30	Stillwater	77.3	99	1	45	23	2	371	.21	.19	30											
Minco	76.5	97	1	48	22	1	346	.86	.85	30	Washington	76.2	100	20	46	23	0	336	.84	.48	4											
Marshall	77.3	99	1	43	22	4	374	.32	.30	30	Yukon	77.0	97	1	48	22	2	362	3.96	3.39	30											
EAST CENTRAL																																
Cookson	75.6	96	20	44	22	6	323	.68	.25	5	Sallisaw	76.4	98	1	43	23	4	347	1.30	.50	5											
Eufaula	77.6	99	4	48	23	0	377	2.04	1.07	29	Stigler	75.9	101	1	40	23	6	333	2.40	.92	4											
Haskell	75.5	97	4	43	23	5	320	1.38	.62	4	Stuart	76.6	99	1	46	23	1	348	2.06	1.18	30											
Hectorville	77.7	100	1	49	23	0	380	4.49	2.02	5	Tahlequah	75.7	98	1	42	23	8	330	.93	.38	5											
Holdenville	76.8	98	4	48	23	0	353	1.77	1.03	30	Webbers Falls	76.4	101	4	42	23	4	345	1.26	.78	8											
McAlester	76.2	98	1	43	23	3	338	1.62	1.16	30	Westville	75.2	96	1	44	23	8	314	1.97	1.18	21											
Okmulgee	75.7	99	1	42	23	4	324	1.54	.71	4																						
SOUTHWEST																																
Altus	78.1	101	20	44	22	2	396	.37	.28	28	Hollis	77.6	100	11	46	23	1	379	.71	.46	28											
Apache	75.8	98	20	44	22	3	327	.70	.57	4	Mangum	77.1	102	1	44	23	1	366	3.04	2.75	28											
Fort Cobb	75.7	98	20	45	22	3	323	.58	.40	4	Medicine Park	78.8	100	4	56	22	0	413	1.36	.79	28											
Grandfield	79.0	104	1	48	22	0	421	.71	.61	28	Tipton	77.8	101	1	44	22	3	386	.79	.54	28											
Hinton	76.1	96	1	45	22	3	337	.10	.09	15	Walters	77.0	101	20	50	23	0	361	.57	.38	28											
Hobart	78.2	101	1	44	22	3	399	.71	.65	28																						
SOUTH CENTRAL																																
Ada	76.6	99	4	43	23	3	352	1.89	1.50	30	Lane	75.3	98	20	42	23	3	313	1.17	.79	30											
Ardmore	77.3	99	20	47	23	0	368	.99	.57	30	Madi11	77.0	100	20	45	23	1	360	.77	.43	28											
Burneyville	76.3	101	20	41	23	4	344	1.74	1.23	28	Newport	77.8	100	20	50	23	0	383	.85	.69	30											
Byars	77.8	99	4	51	22	0	383	2.02	1.13	30	Pauls Valley	77.1	99	20	46	23	0	364	1.35	.97	30											
Centrahoma	75.6	98	4	42	23	****	****	2.00	1.30	4	Ringling	77.9	101	20	49	22	0	388	1.25	.90	30											
Durant	****	***	***	***	***	****	****	1.74	.93	30	Sulphur	76.0	97	4	44	23	2	333	2.36	1.75	30											
Fittstown	75.4	98	20	43	23	3	315	1.48	.85	4	Tishomingo	75.3	97	20	43	23	2	311	.67	.55	30											
Ketchum Ranch	78.3	101	20	48	23	0	398	2.07	1.30	30	Waurika	77.8	103	20	45	23	0	384	3.03	2.37	30											
SOUTHEAST																																
Antlers	74.9	97	20	42	23	5	301	3.41	1.91	8	Mt Herman	74.4	95	1	46	23	4	286	2.30	1.56	5											
Broken Bow	75.0	97	1	45	23	2	301	1.52	.59	30	Talihina	75.8	100	1	40	23	7	332	1.56	.64	5											
Clayton	75.5	98	1	41	23	5	321	1.37	.83	8	Valliant	75.4	97	1	43	23	4	316	1.36	1.14	30											
Cloudy	74.5	95	20	44	23	5	291	1.92	.65	5	Wilburton	75.2	100	1	43	23	5	312	3.68	1.90	5											
Hugo	76.4	97	20	48	23	1	343	1.03	.73	30	Wister	75.3	101	1	39	23	7	315	1.19	.65	30											
Idabel	75.2	96	1	44	23	3	308	.56	.27	5																						

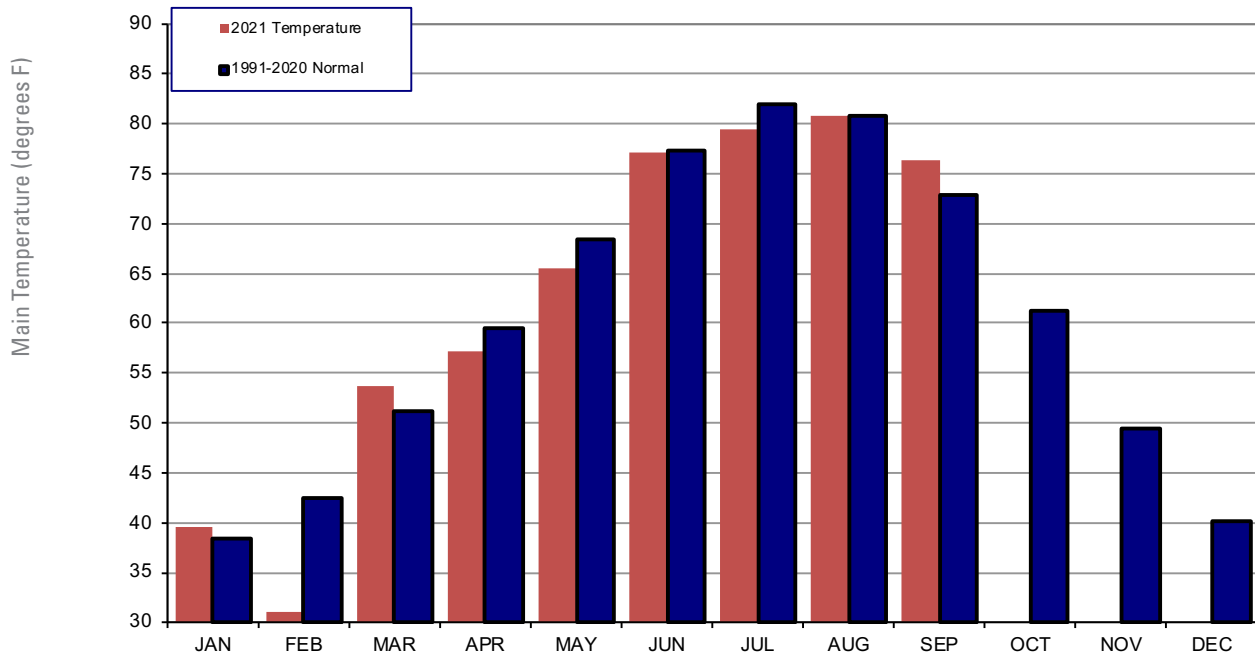
2021 STATEWIDE PRECIPITATION MONTHLY TOTALS VS. NORMAL



September 2021 Mesonet Precipitation Comparison

Climate Division	Precipitation (inches)	Departure from Normal (inches)	Rank since 1895	Wettest on Record (Year)	Driest on Record (Year)	Sep-20 (inches)
Panhandle	0.84	-0.72	25th Driest	5.03 (1925)	0.04 (1956)	1.28
North Central	1.87	-0.61	38th Driest	7.43 (1923)	0.07 (2000)	1.98
Northeast	1.58	-2.38	18th Driest	12.12 (1986)	0.29 (1948)	3.86
West Central	0.81	-1.78	16th Driest	8.68 (1923)	0.06 (1956)	2.39
Central	1.38	-2.24	20th Driest	9.81 (1945)	0.21 (1956)	4.85
East Central	1.80	-2.69	25th Driest	10.16 (1993)	0.24 (1948)	6.69
Southwest	0.88	-2.00	18th Driest	8.48 (1936)	0.04 (1939)	3.86
South Central	1.59	-2.33	30th Driest	10.58 (2018)	0.13 (1956)	6.90
Southeast	1.81	-2.44	23rd Driest	11.97 (1974)	0.36 (2017)	7.89
Statewide	1.41	-1.91	17th Driest	7.77 (1945)	0.25 (1956)	4.39

2021 STATEWIDE TEMPERATURE MONTHLY TOTALS VS. NORMAL



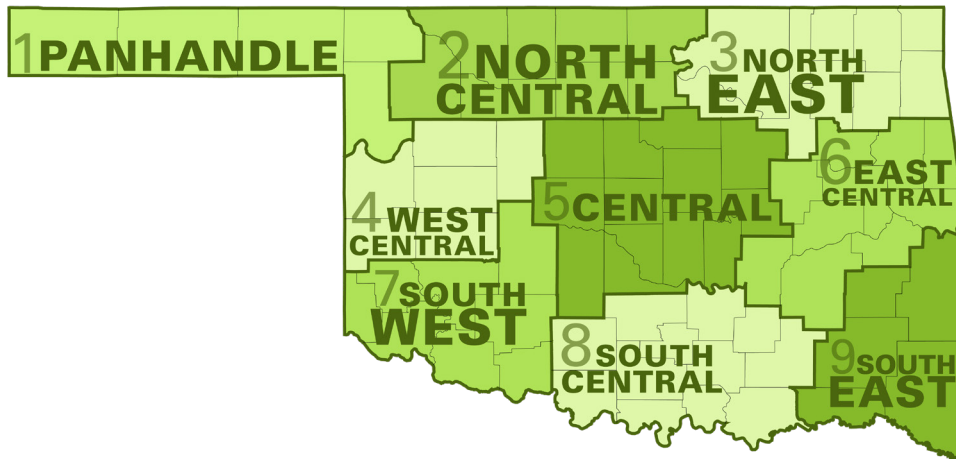
September 2021 Mesonet Temperature Comparison

Climate Division	Average Temp (F)	Departure from Normal (F)	Rank since 1895	Hottest on Record (Year)	Coldest on Record (Year)	Sep-20 (F)
Panhandle	74.3	4.3	9th Warmest	76.9 (1931)	62.3 (1974)	67.0
North Central	77.2	4.8	8th Warmest	80.6 (1931)	63.6 (1974)	69.6
Northeast	76.2	4.2	15th Warmest	79.8 (1939)	63.9 (1974)	70.4
West Central	77.2	4.6	9th Warmest	80.2 (1931)	64.5 (1974)	69.6
Central	76.7	3.4	19th Warmest	81.7 (1931)	64.9 (1974)	70.4
East Central	76.2	3.0	23rd Warmest	81.8 (1939)	65.1 (1974)	71.5
Southwest	77.4	2.9	17th Warmest	81.6 (1931)	66.2 (1974)	70.8
South Central	76.6	2.0	36th Warmest	81.8 (1939)	66.6 (1974)	71.2
Southeast	75.3	1.7	36th Warmest	81.0 (1939)	65.8 (1974)	72.4
Statewide	76.3	3.4	17th Warmest	80.1 (1931)	64.7 (1974)	70.3

MESONET EXTREMES FOR SEPTEMBER 2021

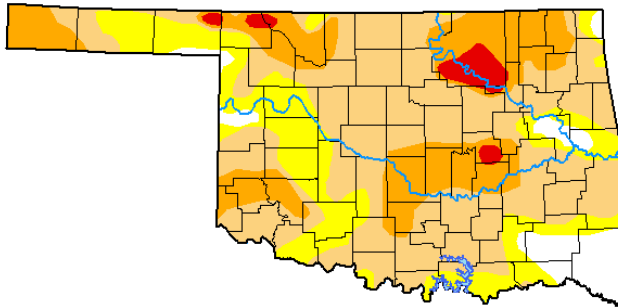
Climate Division	High Temp (F)	Day	Station	Low Temp (F)	Day	Station	High Monthly Rainfall (inches)	Station	High Daily Rainfall (inches)	Day	Station
Panhandle	107	11th	Buffalo	38	22nd	Eva	2.48	Arnett	1.67	17th	Arnett
North Central	104	11th	Freedom	39	22nd	Seiling	4.58	May Ranch	3.96	30th	Lahoma
Northeast	99	1st	Tulsa	42	23rd	Inola	3.78	Miami	1.85	30th	Jay
West Central	101	3rd	Elk City	40	22nd	Camargo	1.74	Cheyenne	1.45	15th	Cheyenne
Central	101	1st	Kingfisher	40	23rd	Bristow	3.96	Yukon	3.68	30th	Kingfisher
East Central	101	1st	Stigler	40	23rd	Stigler	4.49	Hectorville	2.02	5th	Hectorville
Southwest	104	1st	Grandfield	44	22nd	Apache	3.04	Mangum	2.75	28th	Mangum
South Central	103	20th	Waurika	41	23rd	Burneyville	3.03	Waurika	2.37	30th	Waurika
Southeast	101	1st	Wister	39	23rd	Wister	3.68	Wilburton	1.91	8th	Antlers
Statewide	107	11th	Buffalo	38	22nd	Eva	4.58	May Ranch	3.96	30th	Lahoma

Oklahoma Climate Divisions



U.S. Drought Monitor Oklahoma

September 28, 2021
(Released Thursday, Sep. 30, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.45	93.55	73.23	23.72	2.65	0.00
Last Week 09-21-2021	20.56	79.44	39.37	4.62	0.17	0.00
3 Months Ago 06-29-2021	84.11	15.89	1.77	0.24	0.00	0.00
Start of Calendar Year 12-29-2020	56.83	43.17	25.21	7.75	1.45	0.00
Start of Water Year 09-29-2020	66.79	33.21	17.71	11.97	1.55	0.00
One Year Ago 09-29-2020	66.79	33.21	17.71	11.97	1.55	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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National Drought Mitigation Center



droughtmonitor.unl.edu

INTERPRETATION INFORMATION

MEAN DAILY TEMPERATURE: Calculated from an average of the daily maximum and minimum temperatures. Daily averages are summed for each day, and then divided by the number of valid data points – typically the number of days in the month. Although this November differ from the “true” daily average, it is consistent with historical methods of observation and comparable to the normals and extremes for stations and regions of the state.

DEGREE DAYS: Degree Days are calculated each day of the month for which there is a temperature report and the mean temperature for the day is less than (Heating Degree Days) or greater than (Cooling Degree Days) 65 degrees. Daily values are summed to arrive at a monthly total. HDD/CDD are qualitative measures of how much heating/cooling was required to maintain a comfortable indoor temperature. Missing observations November result in an artificially high or low value.

ADDITIONAL RESOURCES

SUNRISE / SUNSET TABLES

U.S. Naval Observatory: <http://aa.usno.navy.mil/data>

SEVERE STORM REPORTS

Storm Prediction Center: <http://spc.noaa.gov/climo/>

National Centers for Environmental Information:
<https://www.ncdc.noaa.gov/stormevents/>

SEASONAL OUTLOOKS

Climate Prediction Center:
http://www.cpc.ncep.noaa.gov/products/OUTLOOKS_index.shtml

CLIMATE CALENDARS AND OTHER LOCAL WEATHER AND CLIMATE INFORMATION

Oklahoma Climatological Survey:
<http://climate.mesonet.org> or <http://climate.ok.gov/>



Oklahoma Climatological Survey is the State Climate Office for Oklahoma

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