NWS FORM E-5 (11-88) (PRES. by NWS Instruction 10-924)	**U.S. DEPARTMENT OF COMMERCE** NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE
MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS	HYDROLOGIC SERVICE AREA (HSA) **Tulsa, Oklahoma (TSA)**
	REPORT FOR: MONTH **October** YEAR **2024**
TO: Hydrometeorological Information Center, W/OH2 NOAA / National Weather Service 1325 East West Highway, Room 7230 Silver Spring, MD 20910-3283	SIGNATURE **Steven F. Piltz** (Meteorologist-in-Charge)
	DATE **November 14, 2024**

When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Instruction 10-924)

[X] An "X" in the box indicates no flood stages were reached in this Hydrologic Service Area (HSA) during the month above.

October 2024 continued a very warm and dry period. Average monthly temperatures were 6-7°F above normal, and outside of a couple of days of rain at the end of the month, this October was dry. Normal rainfall for October ranges from 2.9 inches in Pawnee County to 4.4 inches in Sequoyah County. 3.7 inches is normal across the Ozark region of northwest Arkansas. West central Arkansas averages just under 4 inches, while southeast Oklahoma averages slightly higher amounts of 4.5 inches. This report, past E-5 reports, and monthly hydrology and climatology summaries can be found at https://www.weather.gov/tsa/climo_summary_e5list.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for October 2024 ranged from 0.50" to 4" across eastern OK and northwest AR, with much of the area receiving 0.5"-1.5". These rainfall totals correspond to 5% to 95% of the normal October rainfall, with most of the area receiving less than 50% of normal for the month (Fig. 1b).

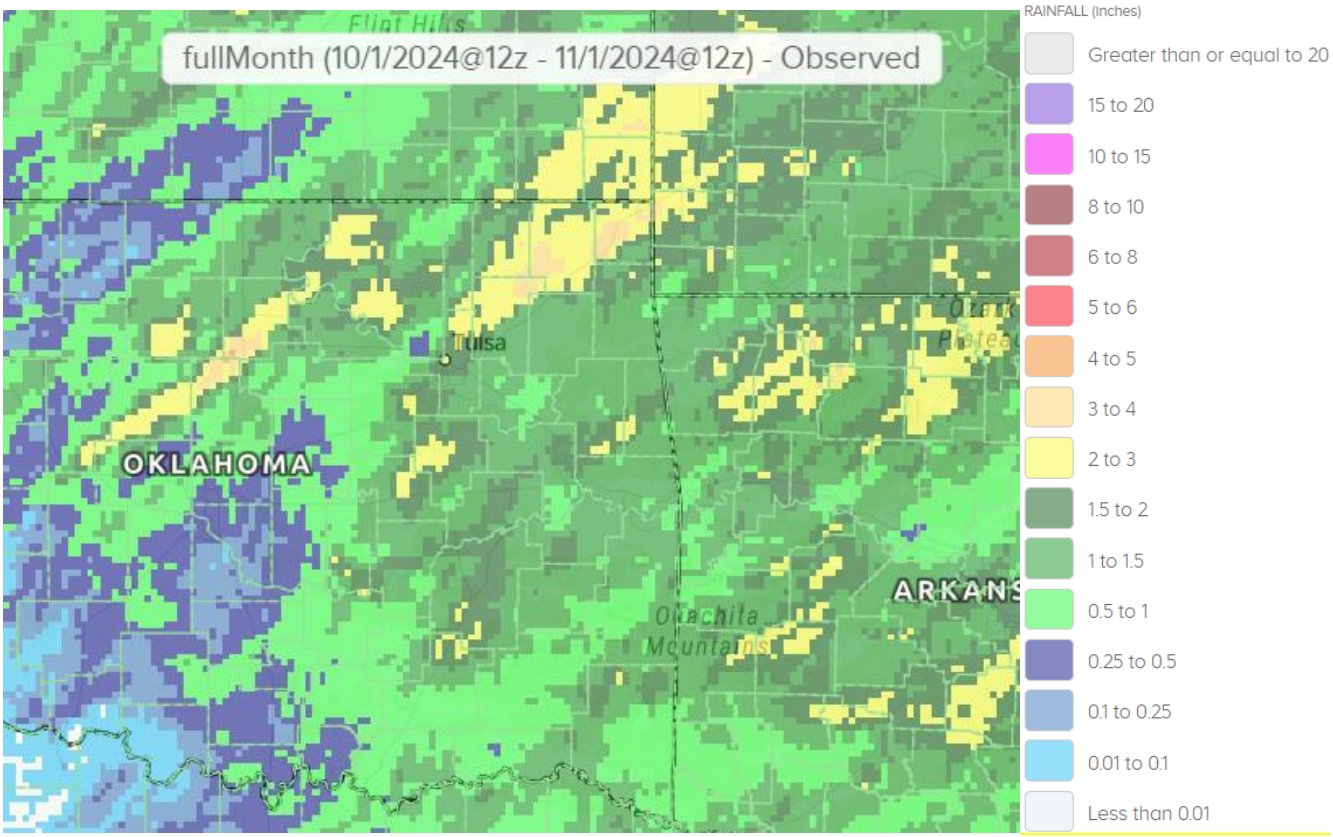


Fig. 1a. Estimated Observed Rainfall for October 2024

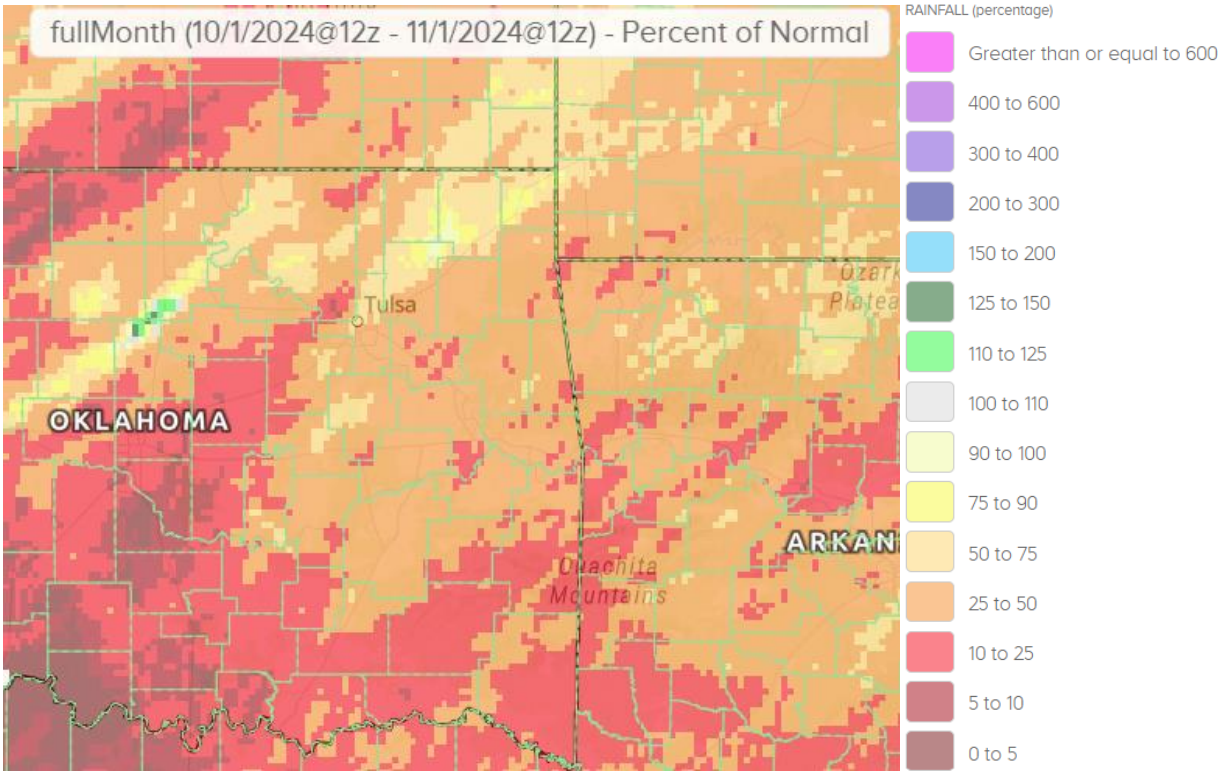


Fig. 1b. Estimated % of Normal Rainfall for October 2024

In Tulsa, OK, October 2024 ranked as the 6th warmest October (68.4°F; since records began in 1905) and the 41st driest October (1.75", tied 1916, 1999; since records began in 1888). Fort Smith, AR had the 2nd warmest October (70.5°F; since records began in 1882) and the 26th driest October (1.25"; since records began in 1882). Fayetteville, AR had the 2nd warmest (65.1°F) and the 13th driest (1.37", tied 1957) October since records began in 1949.

Some of the larger precipitation reports (in inches) for October 2024 included:

Metalton 3.5W,AR (coco)	3.35	Kingston 2S, AR (coop)	3.22	Fayetteville 1.0E, AR (coco)	3.00
Vinita 4.9WNW, OK (coco)	2.92	Miami, OK (meso)	2.75	Wyandotte 7.3NE, OK (coco)	2.62
Miami 3.7 ENE, OK (coco)	2.56	Winslow 7NE, AR (coop)	2.50	Okemah, OK (meso)	2.39

Some of the lowest precipitation reports (in inches) for October 2024 included:

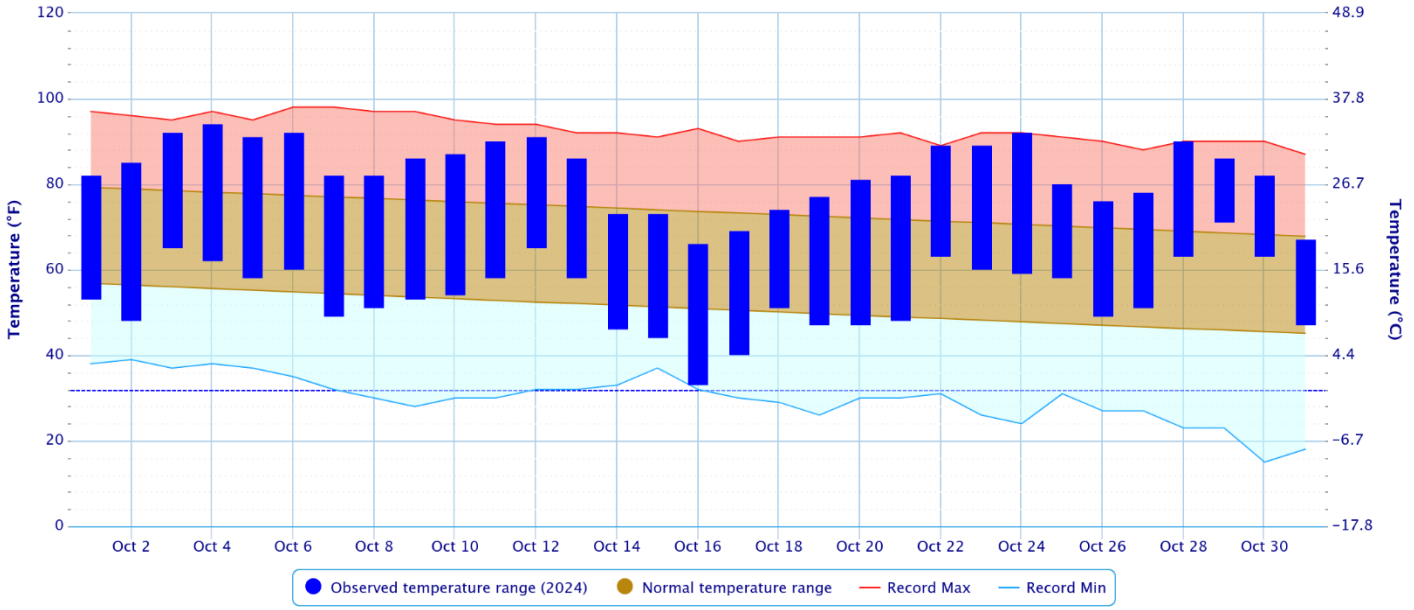
Oilton, OK (meso)	0.62	Antlers, OK (coop)	0.70	Talihina, OK (meso)	0.76
Centerton 1.0E, AR (coco)	0.80	Hugo, OK (meso)	0.81	Antlers, OK (meso)	0.83
Clayton, OK (meso)	0.88	Copan, OK (meso)	0.90	Ozark 4.6S, AR (coco)	0.90

According to statistics from the Oklahoma Climatological Survey (OCS) Mesonet:

Rank since 1921	October 2024	Autumn-to-Date (Sep 1 – Oct 31)	Last 90 Days (Aug 3 – Oct 31)	Last 120 Days (Aug 3 – Oct 31)	Year-to-Date (Jan 1 – Oct 31)	Last 180 Days (May 5 – Oct 31)	Last 365 Days (Nov 2, 2023 – Oct 31, 2024)
Northeast OK	23rd driest	**5th driest**	**8th driest**	**10th driest**	20th driest	13th driest	18th driest
East Central OK	24th driest	**10th driest**	35th driest	34th driest	42nd driest	32nd driest	38th driest
Southeast OK	12th driest	13th driest	**8th driest**	14th driest	35th driest	20th driest	31st driest
Statewide	**10th driest**	**4th driest**	**9th driest**	15th driest	25th driest	16th driest	30th driest

Daily Temperature Data – Tulsa Area, OK (ThreadEx)

Period of Record – 1905-01-06 to 2024-11-07. Normals period: 1991-2020. Click and drag to zoom chart.



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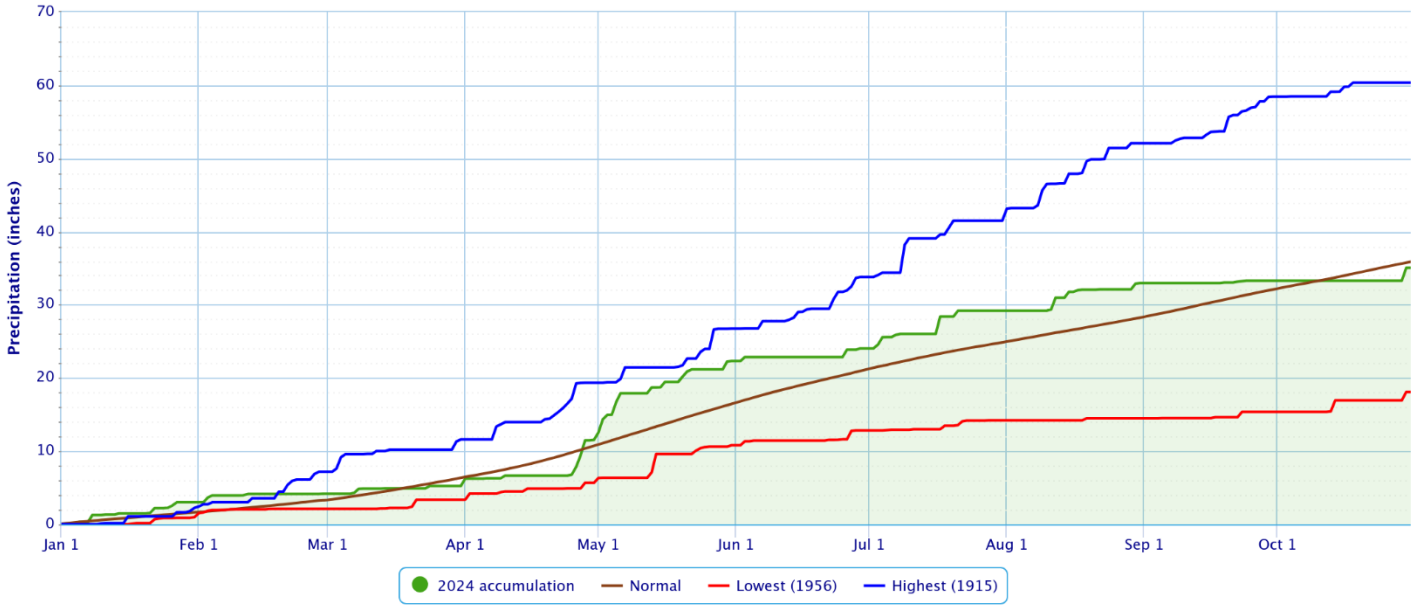
Accumulated Precipitation – Tulsa Area, OK (ThreadEx)

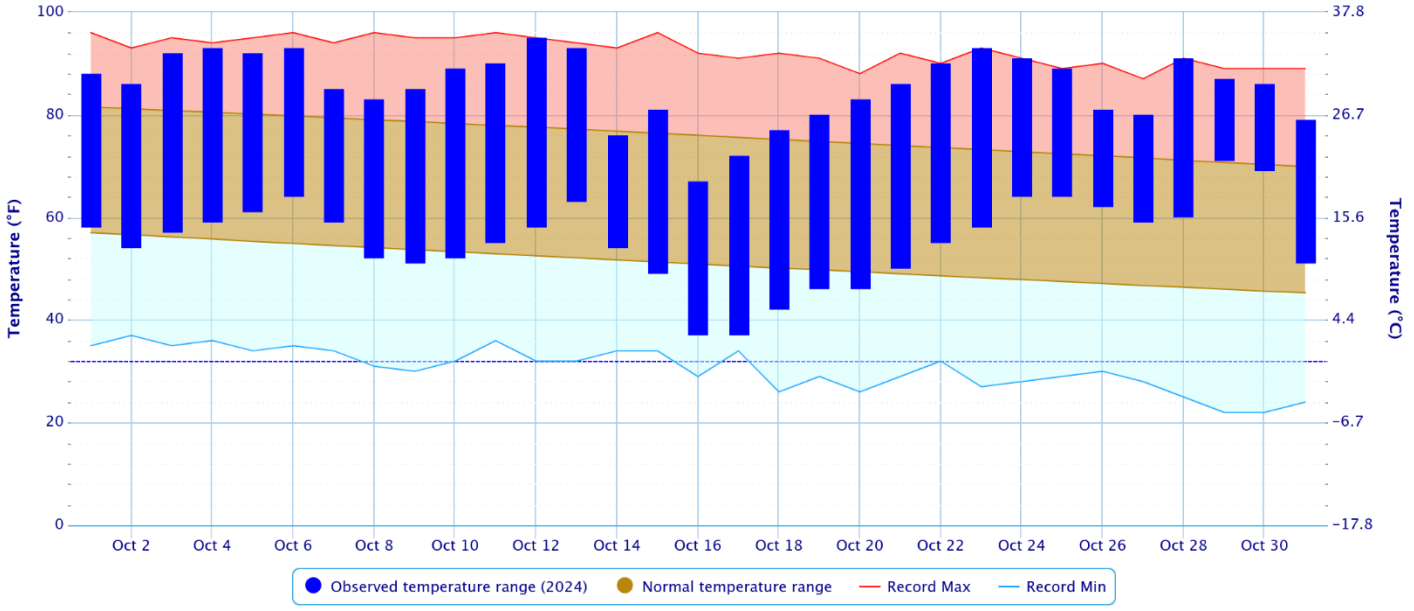
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

Daily Temperature Data – Fort Smith Area, AR (ThreadEx)

Period of Record – 1882-06-01 to 2024-11-07. Normals period: 1991-2020. Click and drag to zoom chart.



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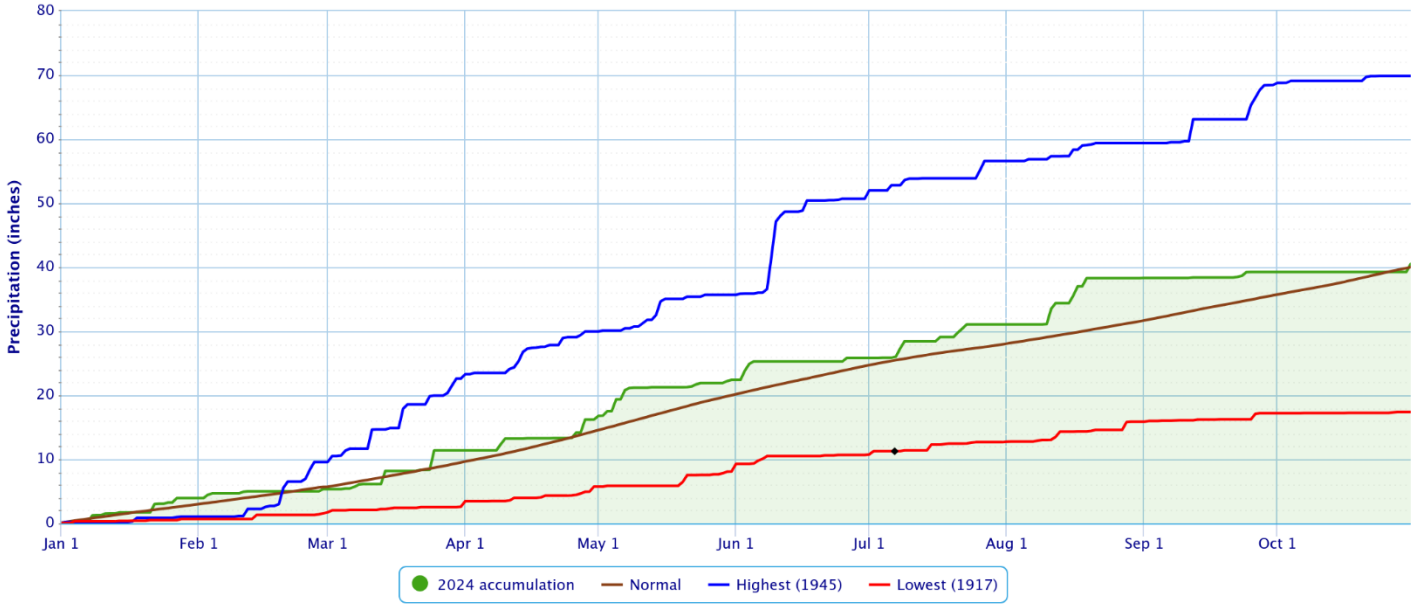
Accumulated Precipitation – Fort Smith Area, AR (ThreadEx)

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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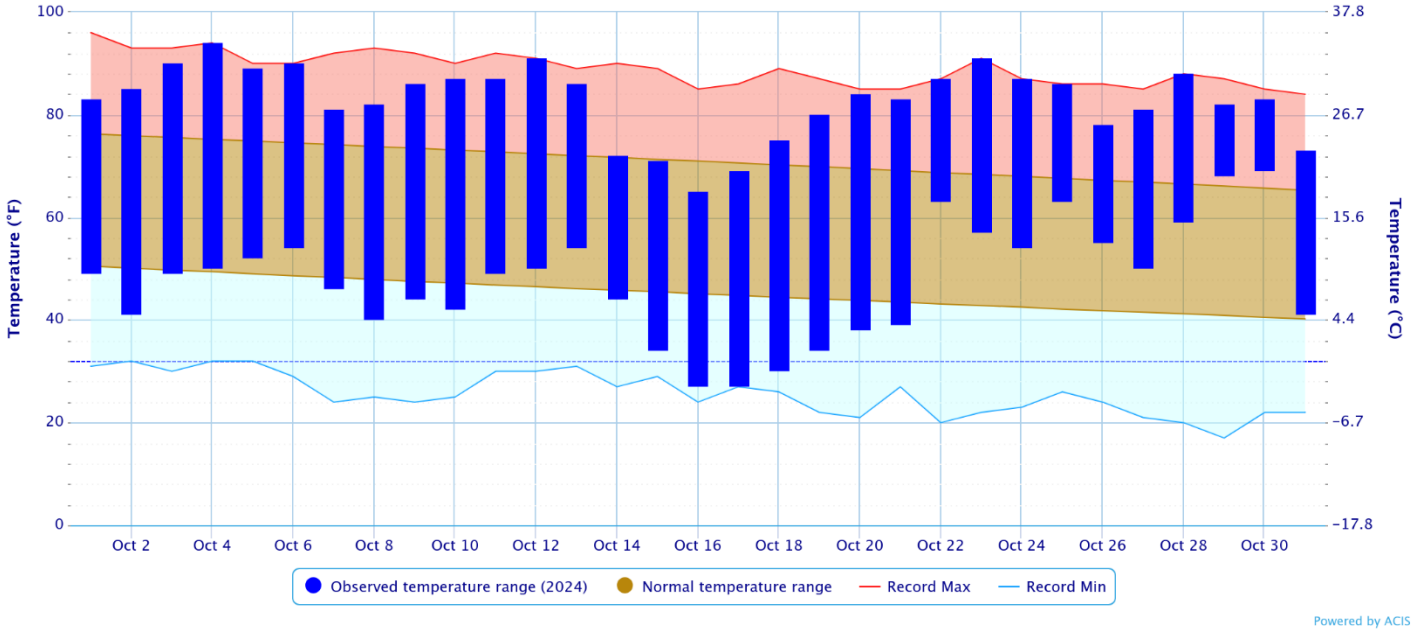
Daily Temperature Data – FAYETTEVILLE DRAKE FIELD, AR

Period of Record – 1949-07-14 to 2024-11-07. Normals period: 1991-2020. Click and drag to zoom chart.



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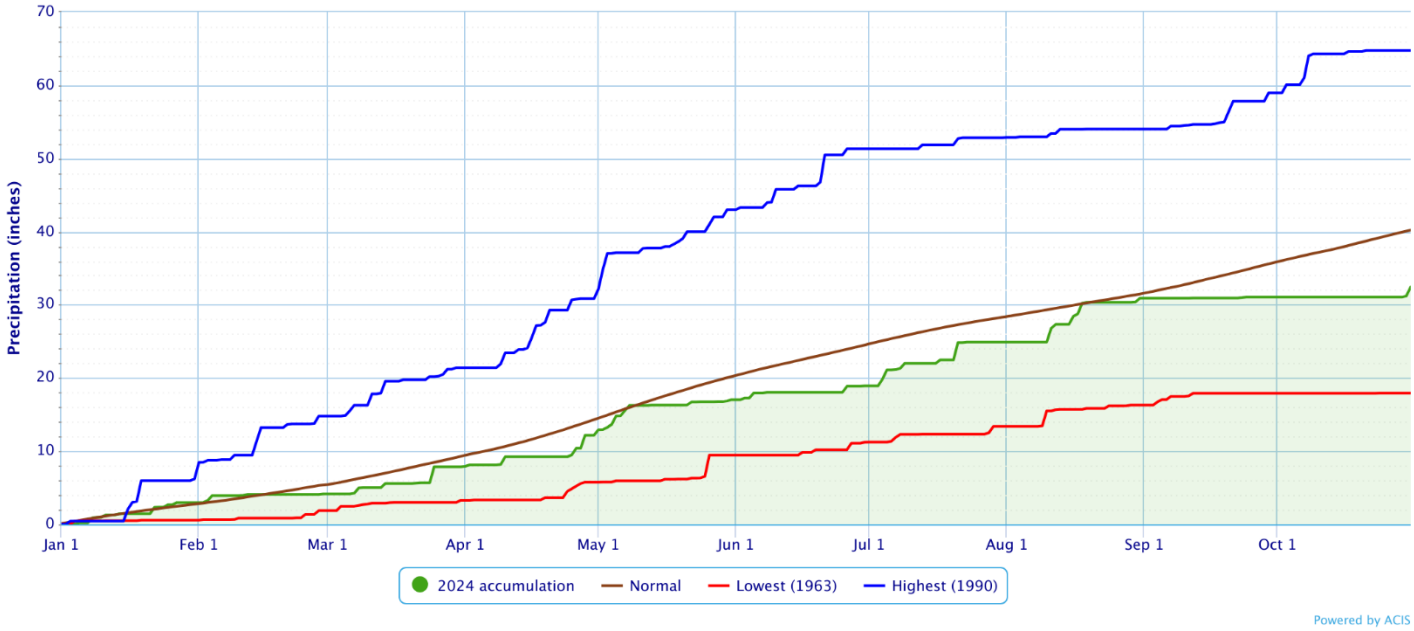
Accumulated Precipitation – FAYETTEVILLE DRAKE FIELD, AR

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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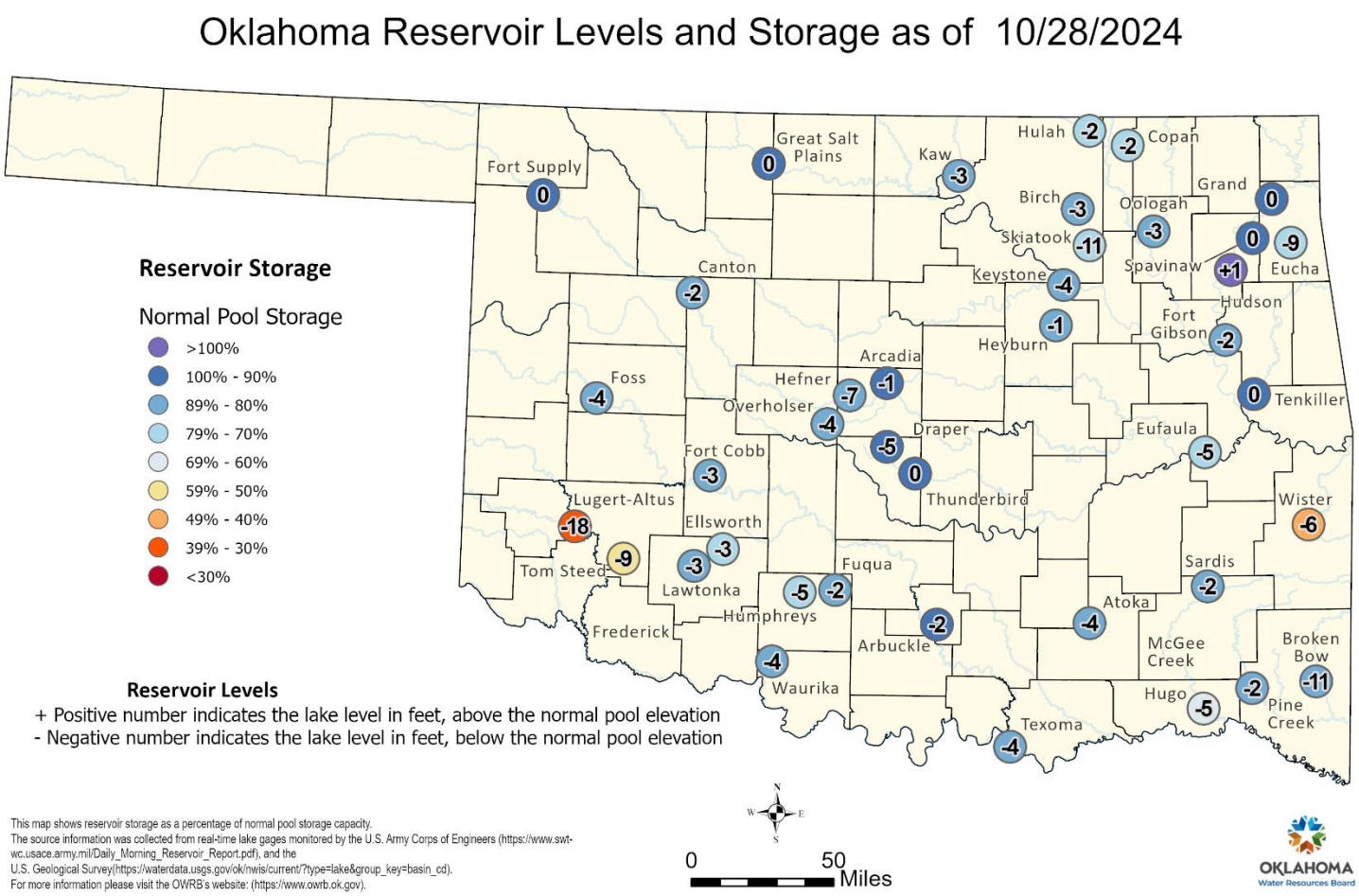
Reservoirs



According to the USACE, many of the lakes in the HSA were below 3% of top of their conservation pools as of 10/28/2024: Ft. Gibson Lake 25%, Wister Lake 42%, Hugo Lake 53%, Eufaula Lake 66%, Skiatook Lake 69%, Keystone Lake 69%, Heyburn Lake 74%, Hulah Lake 75%, Beaver Lake 76%, Copan Lake 77%, Birch Lake 78%, Oologah Lake 84%, Kaw Lake 86%, and Sardis Lake 91%. One lake was above 3% of the top of its conservation pool: Hudson Lake 6%.

Drought

According to the U.S. Drought Monitor (USDM) from October 29, 2024 (Figs. 2, 3), Extreme (D3) Drought expanded over portions of Osage, Washington, Nowata, Craig, Ottawa, Tulsa, Rogers, Mayes, Delaware, Wagoner, Cherokee, Adair, Pittsburg, Pushmataha, Choctaw, and Le Flore Counties in northeast OK, and Benton, Carroll, Washington, and Madison Counties in northwest AR. Severe (D2) Drought was present in portions of Osage, Pawnee, Tulsa, Creek, Wagoner, Cherokee, Adair, Okfuskee, Okmulgee, McIntosh, Pittsburg, Latimer, Le Flore, and Pushmataha Counties in eastern OK, and Washington, Crawford, Madison, Franklin, and Sebastian Counties in northwest AR. Moderate (D1) drought conditions were occurring across portions of Creek, Okmulgee, Adair, Cherokee, Wagoner, Muskogee, McIntosh, Haskell, Pittsburg, Latimer, and Le Flore Counties in eastern OK, and Washington, Crawford, Franklin, and Sebastian Counties in northwest AR. Abnormally Dry (D0) but not in drought conditions were occurring in parts of Muskogee, Cherokee, Adair, Sequoyah, and Le Flore Counties in eastern OK and Crawford and Sebastian Counties in northwest AR.

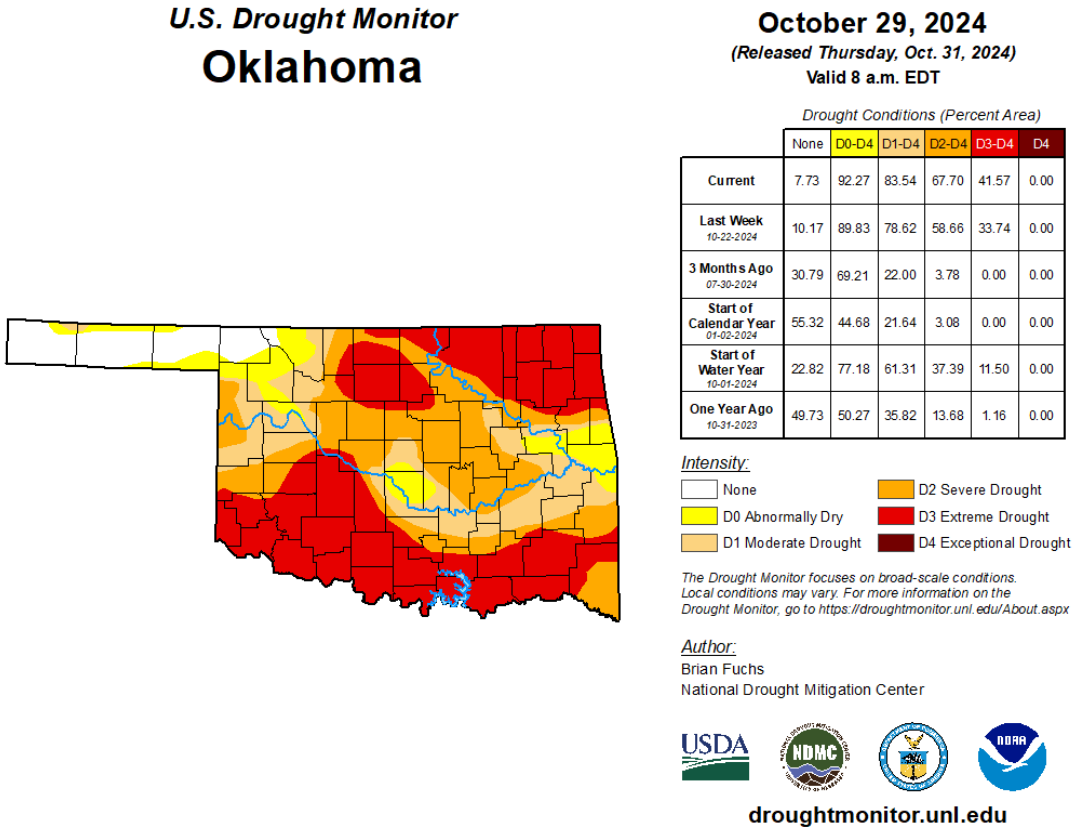


Fig. 2. Drought Monitor for Oklahoma

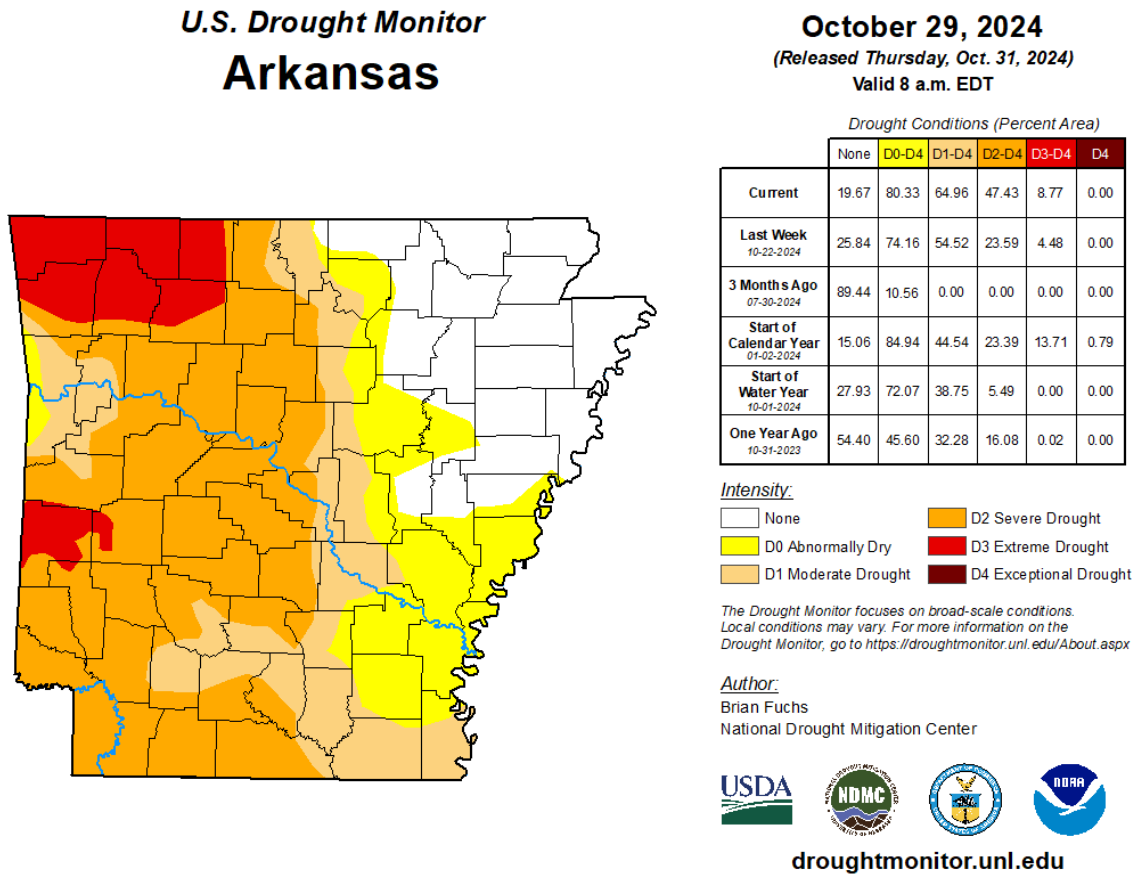


Fig. 3. Drought Monitor for Arkansas

Outlooks

The Climate Prediction Center (CPC) outlook for November 2024 (issued October 31, 2024) indicates an enhanced chance for above normal temperatures and a likely chance for above median precipitation across all of eastern OK and northwest AR. This outlook was based on dynamical and statistical model output along with long-term trends. The enhanced chance for above median precipitation is due to the short-term heavy rain expected the first week of November, though there are indications that a wetter pattern may persist this month.

For the 3-month period November-December-January 2024-25, CPC is forecasting an enhanced chance for above normal temperatures across all of eastern OK and northwest AR (outlook issued October 17, 2024). This outlook also indicates an equal chance for above, near, and below median precipitation across far northeast OK and far northwest AR, and an enhanced chance for below normal precipitation elsewhere. This outlook is based on long-term trends, ENSO state, and incorporates a suite of statistical and dynamical forecast tools. According to CPC, "La Niña is favored to emerge in September-November (60% chance) and is expected to persist through January-March 2025." CPC continues the La Niña Watch.

Summary of Heavy Precipitation Events Daily quality-controlled rainfall maps can be found at: http://water.weather.gov/precip/index.php?location_type=wfo&location_name=tsa

October 2024 was a very dry month. A small area of northeast OK received a few hundredths to around half an inch of rain on October 21st, but it wasn't until October 30th that widespread rain returned to the area after an extended period of dryness. Prior to the 30th, it had been over a month since eastern OK and northwest AR had received more than 0.25" of rain, with some areas experiencing 60-75 consecutive days with less than 0.25" of rain (Figs. 4-7). The Oklahoma Climatological Survey climate division rankings were the record driest for east central and southeast OK and the 2nd driest for northeast OK for the 30-day period ending Oct. 29th (Fig. 8). For the September 1-October 29th period, Oklahoma Climatological Survey climate division rankings were the 2nd driest for northeast and east central OK and the 7th driest for southeast OK (Fig. 9). The 30-day rainfall totals ending at 7 am CDT October 30 ranged from zero to around 0.50" (Fig. 10), which corresponds to 0%-25% of the normal rainfall (Fig. 11). For the 60-day period ending at 7 am CDT October 30, rainfall totals ranged from a few hundredths of an inch to around 4" (Fig. 12), which corresponds to around 50% to less than 5% of normal (Fig. 13).

Moisture finally returned to the region on strong southerly winds on the 30th, ahead of an advancing mid-level trough and associated cold front. This warm, moist advection combined with a strong low-level jet, resulted in a very favorable convective environment. A line of thunderstorms developed along the cold front and moved into northeast OK from the west during the evening hours of the 30th. This line of storms marched slowly southeast across eastern OK and northwest AR through the evening and overnight hours and exited the region by 8am on the 31st. Rainfall totals ranged from 0.50" to around 3", with much of eastern OK and northwest AR receiving 0.75"-1.5" of rain (Figs. 14, 15). These storms also produced three EF-1 tornadoes (see https://arcg.is/0eHLf0 for details).

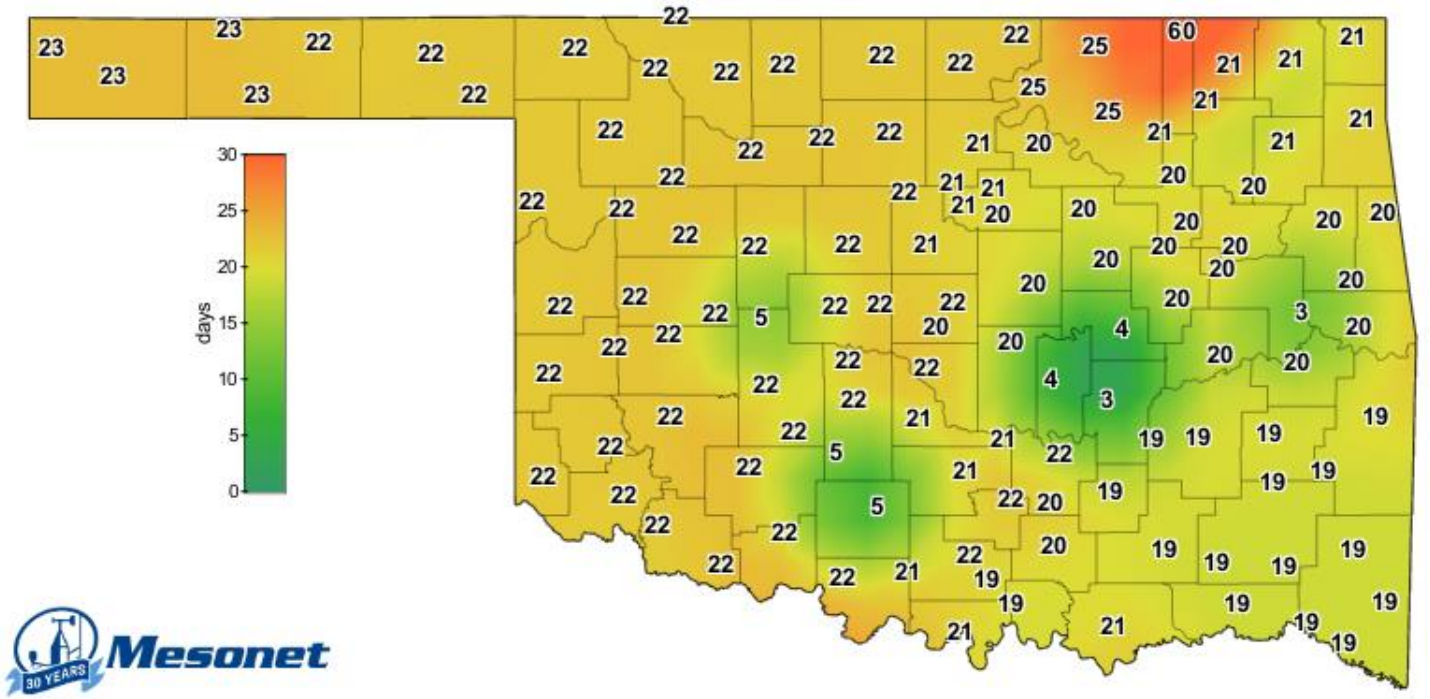


Fig. 4. OK Mesonet Consecutive Days with less than 0.10” of rain valid October 14, 2024.

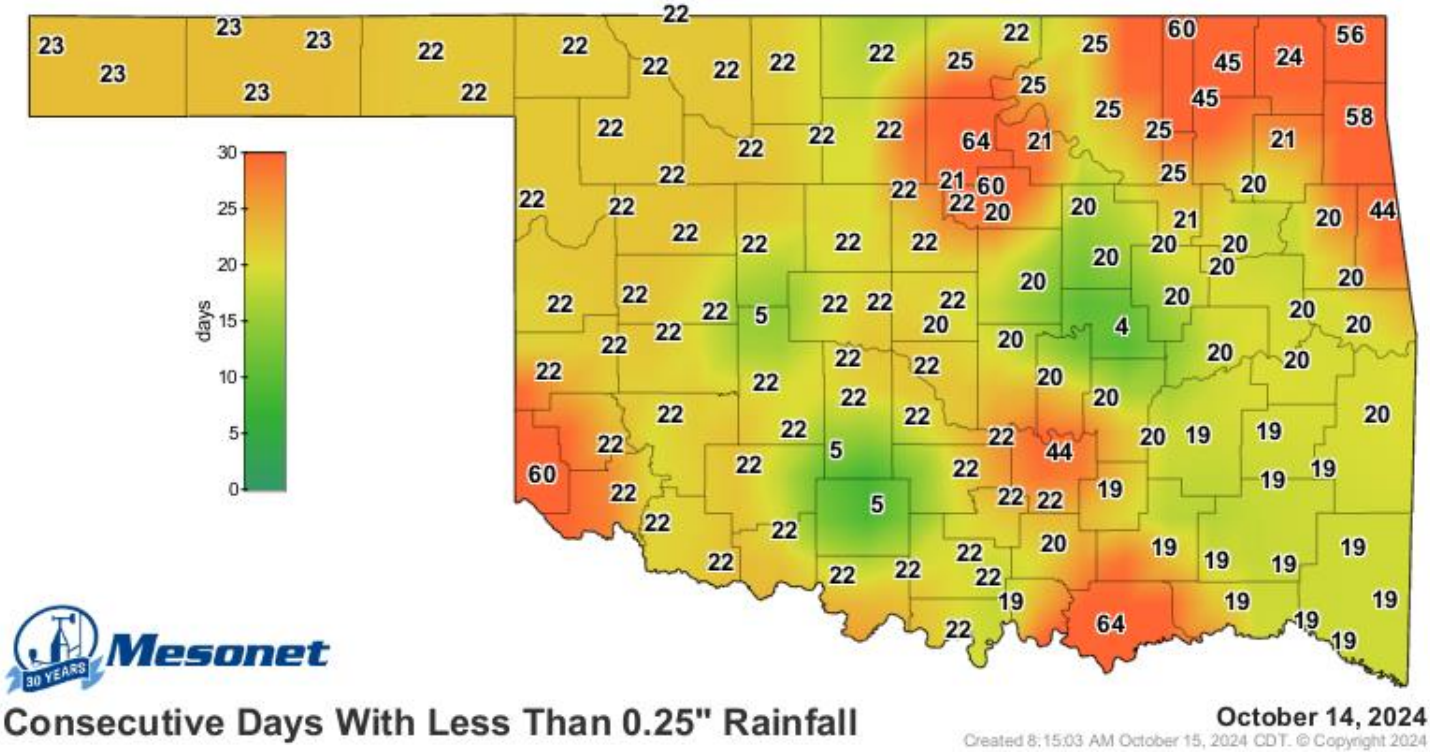


Fig. 5. OK Mesonet Consecutive Days with less than 0.25” of rain valid October 14, 2024.

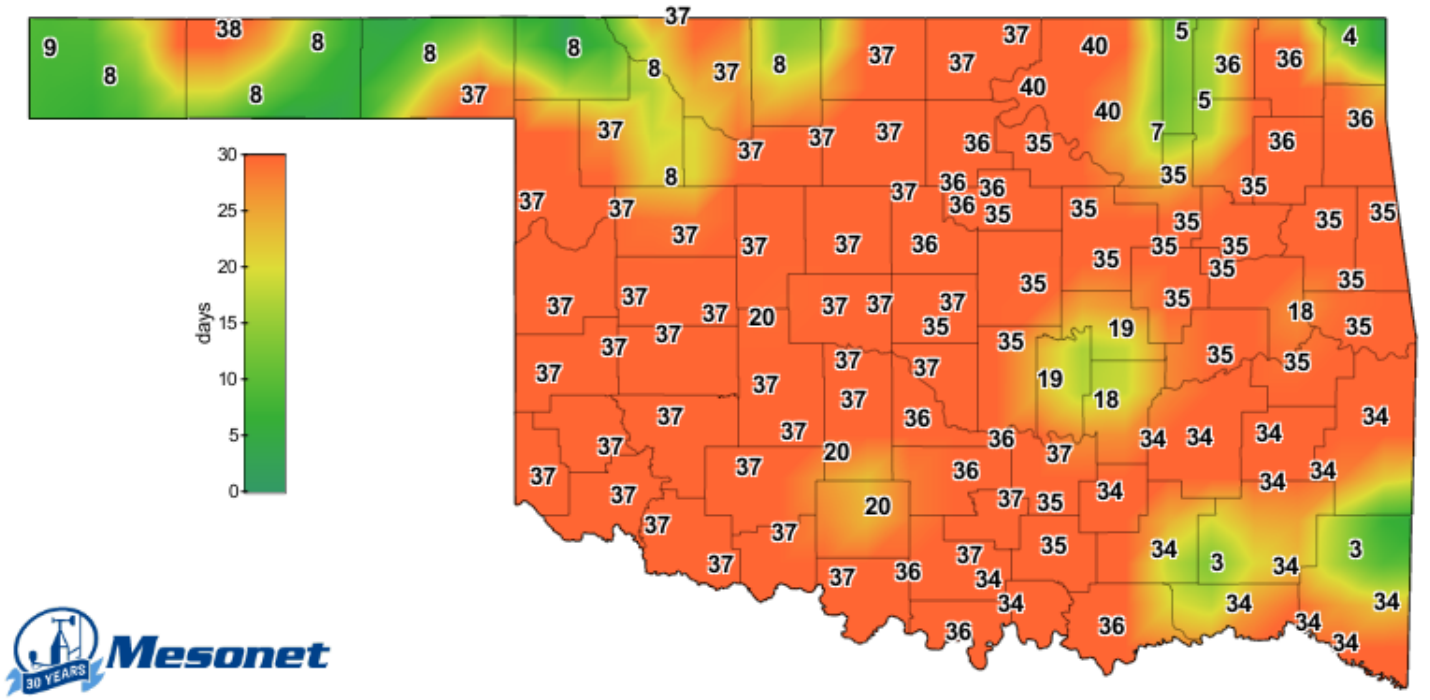


Fig. 6. OK Mesonet Consecutive Days with less than 0.10” of rain valid October 29, 2024.

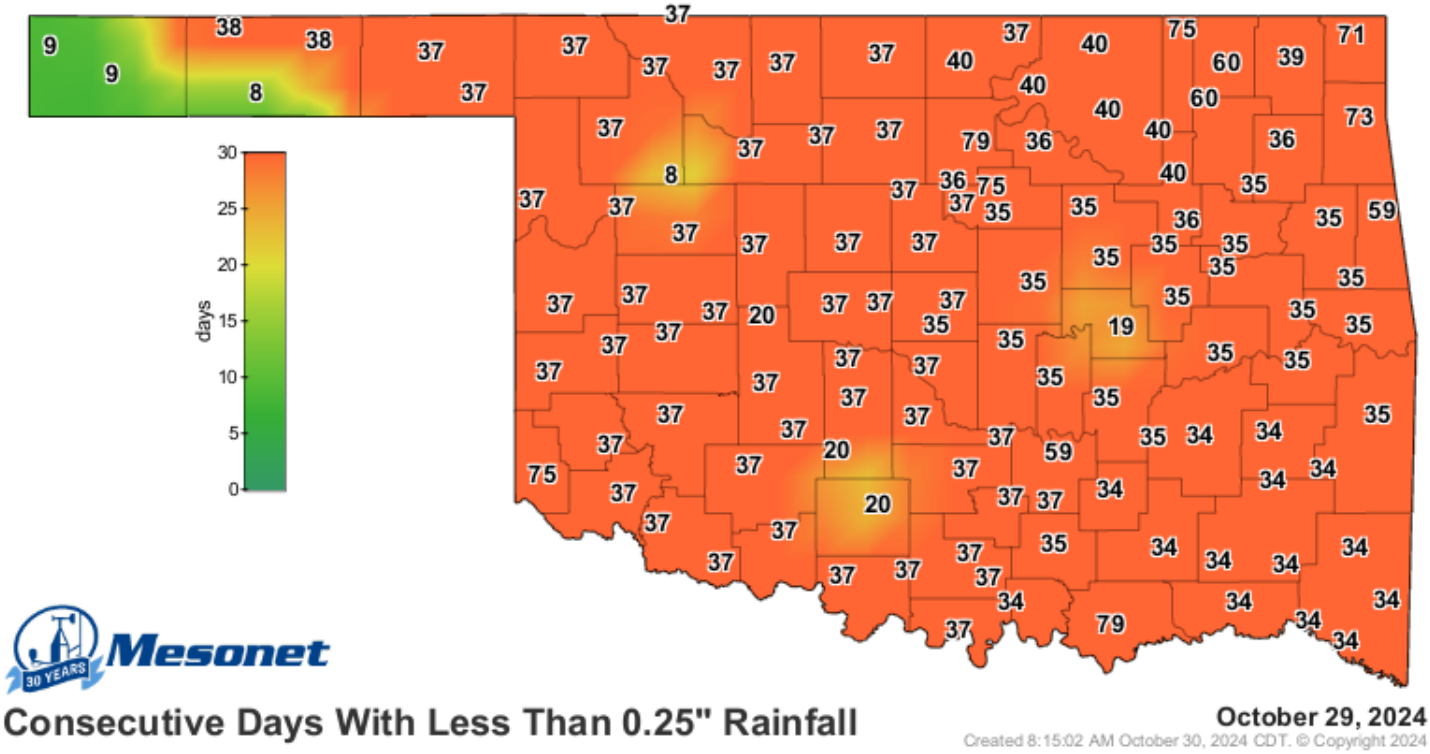


Fig. 7. OK Mesonet Consecutive Days with less than 0.25” of rain valid October 29, 2024.

Last 30 Days: Sep 30, 2024 – Oct 29, 2024

1981–2010 normals · 104 periods in record

Climate Division	Total Rainfall	Departure from Normal	Percentage of Normal	Rank (since 1921)	Driest on Record	Wettest on Record
Panhandle	0.43"	-1.28"	25%	22nd driest	0.02" 1952	6.60" 2018
N. Central	0.07"	-2.82"	2%	2nd driest	0.00" 1952	10.10" 1986
Northeast	0.08"	-3.53"	2%	2nd driest	0.04" 1952	13.33" 1941
W. Central	0.01"	-2.76"	0%	2nd driest	0.00" 1952	10.56" 1986
Central	0.06"	-3.57"	2%	2nd driest	0.03" 1952	10.54" 1983
E. Central	0.05"	-4.19"	1%	1st driest	0.10" 1999	10.76" 2019
Southwest	0.04"	-3.04"	1%	3rd driest	0.00" 1952	11.67" 1983
S. Central	0.05"	-4.11"	1%	2nd driest	0.04" 1921	14.88" 1981
Southeast	0.04"	-4.72"	1%	1st driest	0.15" 1924	12.97" 1954
Statewide	0.09"	-3.33"	3%	1st driest	0.13" 1952	8.88" 1941

Fig. 8. OK Climatological Survey Last 30 Days Climate Division rainfall and rankings valid Sep. 30-Oct. 29, 2024.

Autumn 2024: Sep 1, 2024 – Oct 29, 2024

1981–2010 normals · 104 periods in record

Climate Division	Total Rainfall	Departure from Normal	Percentage of Normal	Rank (since 1921)	Driest on Record	Wettest on Record
Panhandle	2.43"	-0.94"	72%	34th driest	0.33" 1992	10.94" 1923
N. Central	1.60"	-4.07"	28%	7th driest	0.35" 1952	15.53" 1923
Northeast	0.69"	-7.28"	9%	2nd driest	0.41" 1952	20.90" 1941
W. Central	1.69"	-3.79"	31%	10th driest	0.26" 1952	17.12" 1923
Central	1.56"	-5.79"	21%	3rd driest	0.57" 1952	18.80" 1923
E. Central	1.49"	-7.38"	17%	2nd driest	0.89" 1948	19.31" 1970
Southwest	1.17"	-4.83"	19%	4th driest	0.19" 1952	15.81" 1986
S. Central	1.14"	-6.87"	14%	2nd driest	0.59" 1952	19.56" 2018
Southeast	2.81"	-6.10"	32%	7th driest	1.15" 1963	21.12" 2009
Statewide	1.59"	-5.26"	23%	3rd driest	0.82" 1952	15.39" 1923

Fig. 9. OK Climatological Survey Autumn-to-Date Climate Division rainfall and rankings valid Sep. 1-Oct. 29, 2024.

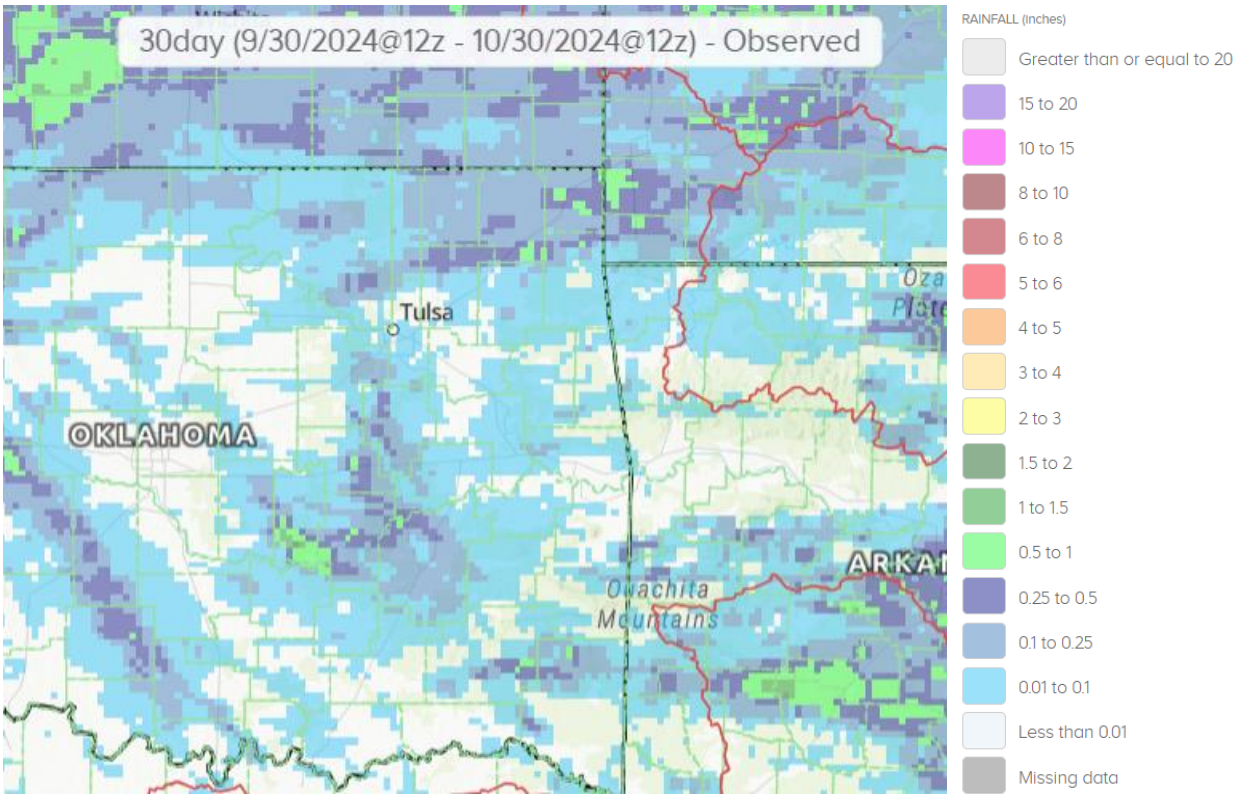


Fig. 10. 30-Day Estimated Observed Rainfall ending at 7am CDT 10/30/2024.

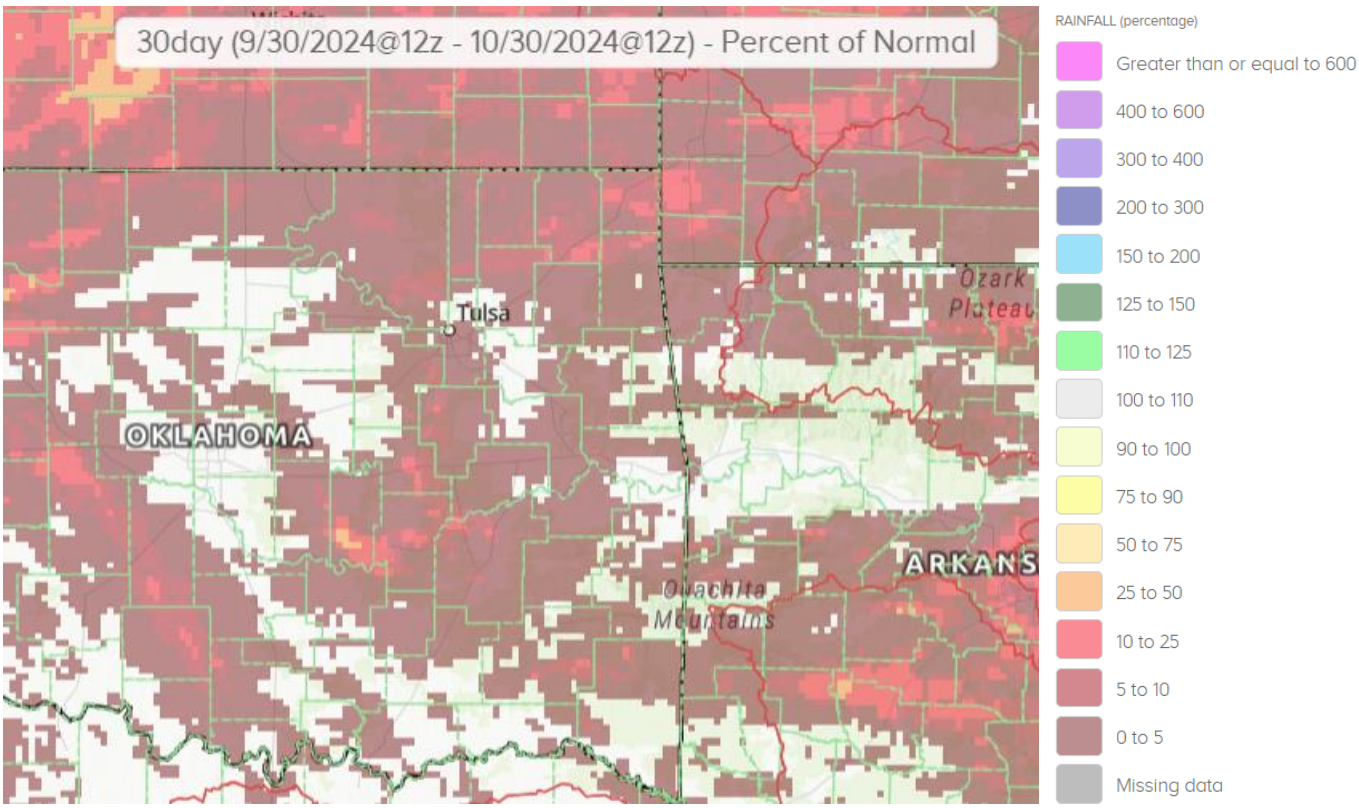


Fig. 11. 30-Day Estimated % of Normal Rainfall ending at 7am CDT 10/30/2024.

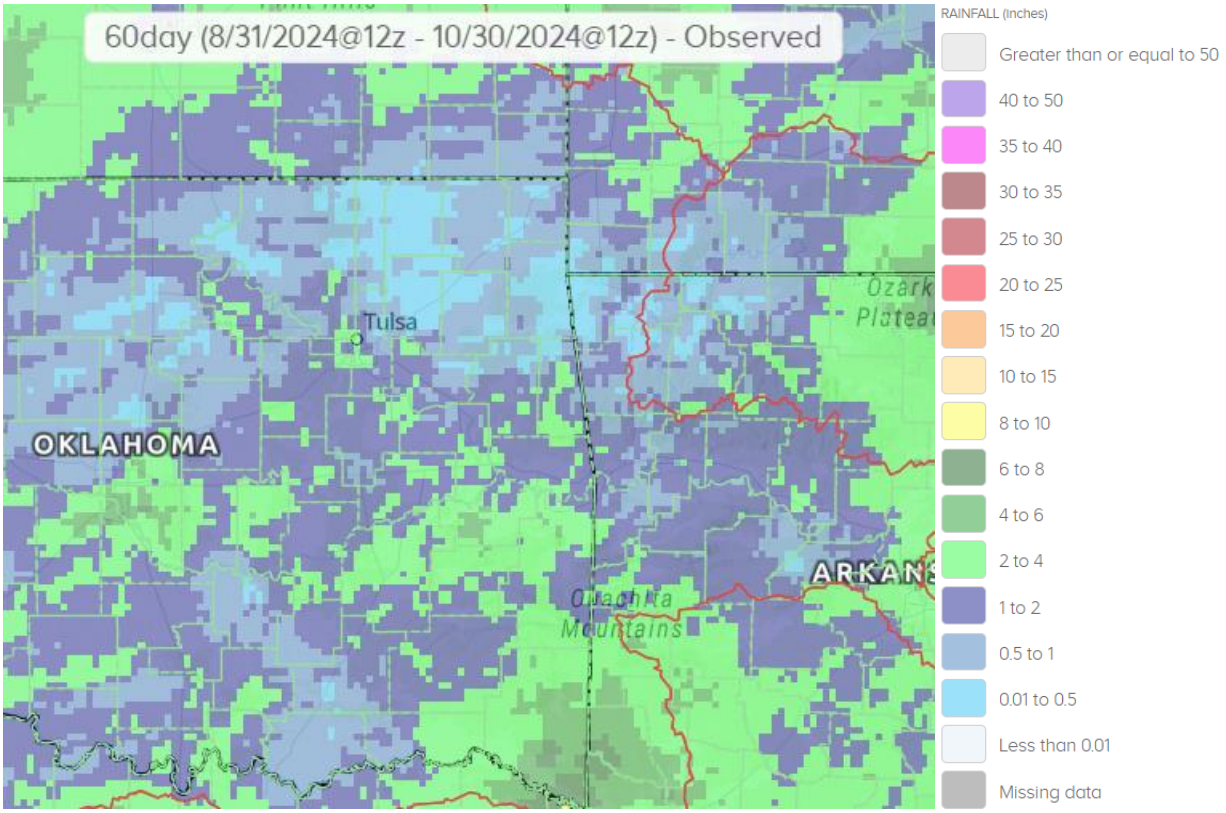


Fig. 12. 60-Day Estimated Observed Rainfall ending at 7am CDT 10/30/2024.

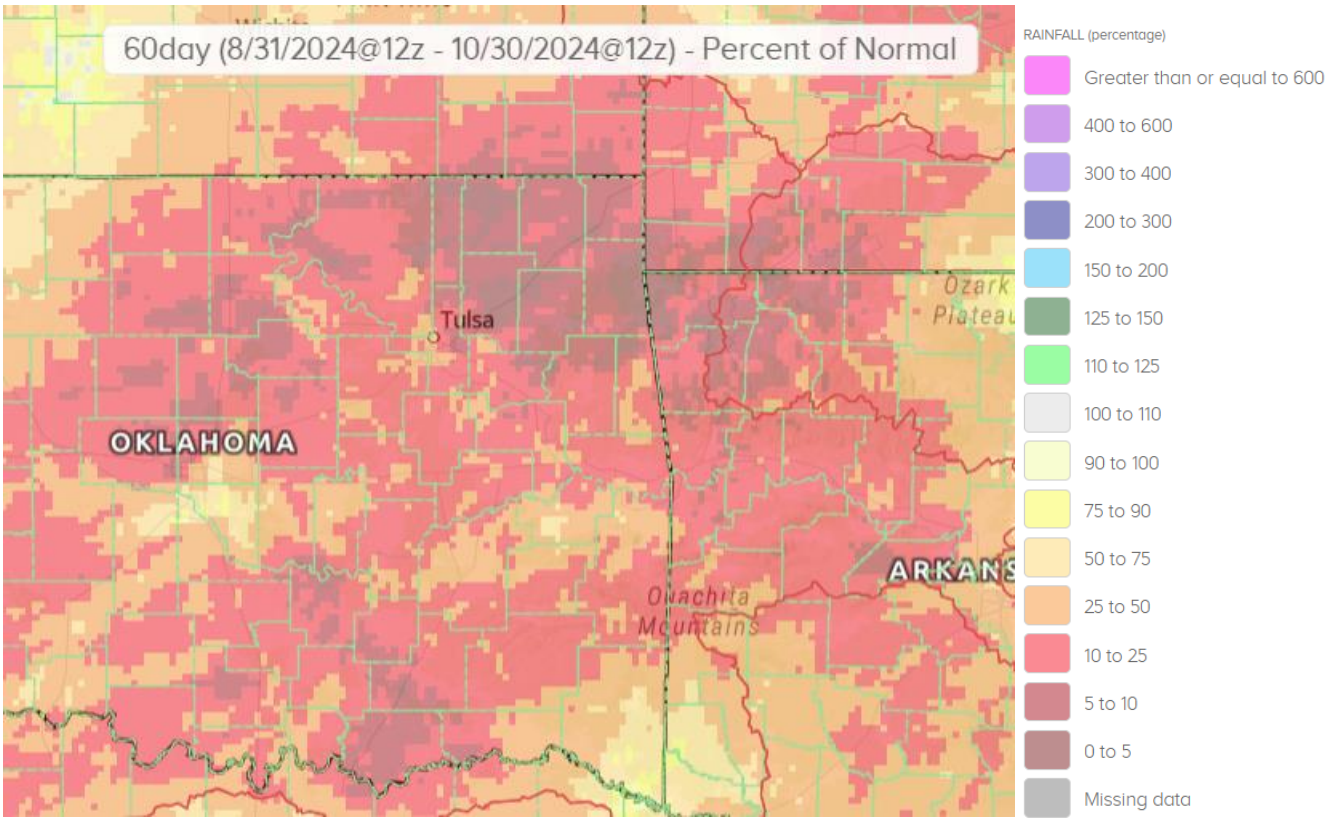


Fig. 13. 60-Day Estimated % of Normal Rainfall ending at 7am CDT 10/30/2024.

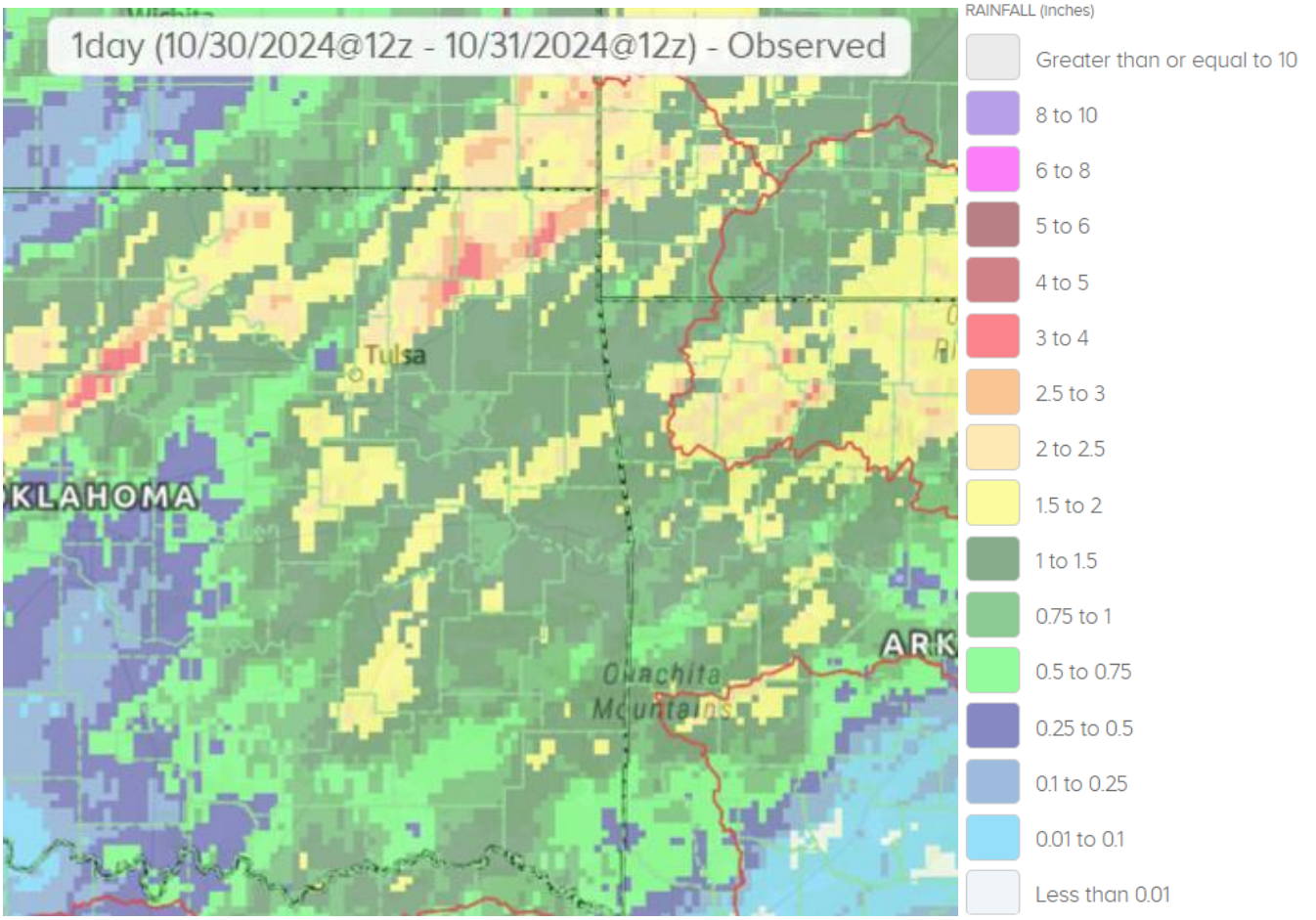


Fig. 14. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/31/2024.

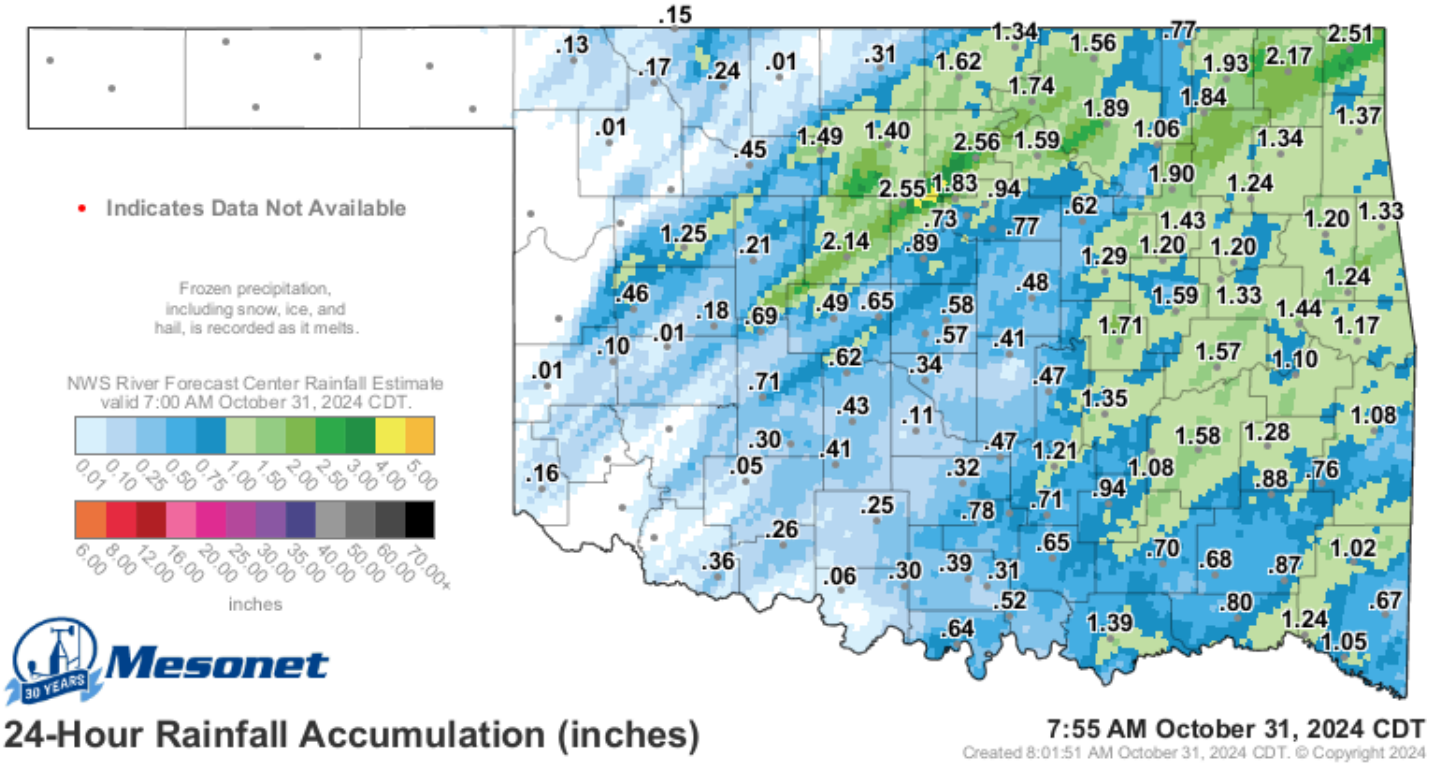


Fig. 15. OK Mesonet (values) and NWS RFC rainfall estimate (image) 24-hour rainfall ending at 7:55 am CDT 10/31/2024.

Written by:
Nicole McGavock
Service Hydrologist
WFO Tulsa

Products issued in October 2024:

0 Flash Flood Warnings (FFW)
0 Flash Flood Statements (FFS)
0 Flash/Areal Flood Watches (FFA) (0 Watch FFA CON/EXT/EXA/EXB/CAN)
0 Urban and Small Stream Advisories (FLS)
0 Areal Flood Warnings (FLW)
0 Areal Flood Statements (FLS)
0 River Flood Warnings (FLW) (includes category increases)
0 River Flood Statements (FLS)
0 River Flood Advisories (FLS) (0 Advisory FLS CON/EXT/CAN)
0 River Flood Watches (FFA) (0 Watch FFA CON/EXT/CAN)
0 River Statements (RVS)
0 Hydrologic Outlooks (ESF)
1 Drought Information Statements (DGT)

Preliminary Hydrographs:
None