

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	HYDROLOGIC SERVICE AREA (HSA)	
		Tulsa, Oklahoma (TSA)	
MONTHLY REPORT OF RIVER AND FLOOD CONDITIONS		REPORT FOR:	
		MONTH September	YEAR 2017
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 October 6, 2017	

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)

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

It was a well below normal rainfall month across eastern OK and northwest AR. Fort Smith, AR only received a trace of rain making this the record driest September since records began there in 1882! Southeast OK also ranked as the driest on record, with two Mesonet stations receiving no rain at all. Three devastating hurricanes, Harvey, Irma, and Maria, impacted the U.S. this month, but did not affect eastern OK and northwest AR. Normal rainfall for September ranges from 4.2 inches in Okmulgee County to 5.4 inches in Delaware County. In the Ozark region of northwest Arkansas, rainfall averages 4.5 inches for the month. This report, past E-5 reports, and monthly hydrology and climatology summaries can be found at <http://www.weather.gov/tsa/hydro-monthly-summary>.

Monthly Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 1a), rainfall totals for September 2017 ranged from 0" to around 4". Portions of far east central OK, southeast OK and west central AR received no measureable rainfall this month. This corresponds to 0% to near 75% of the normal September rainfall for a majority of the area (Fig. 1b). Only small portions of Osage, Kay, Pawnee, and Nowata Counties received near normal September rainfall.

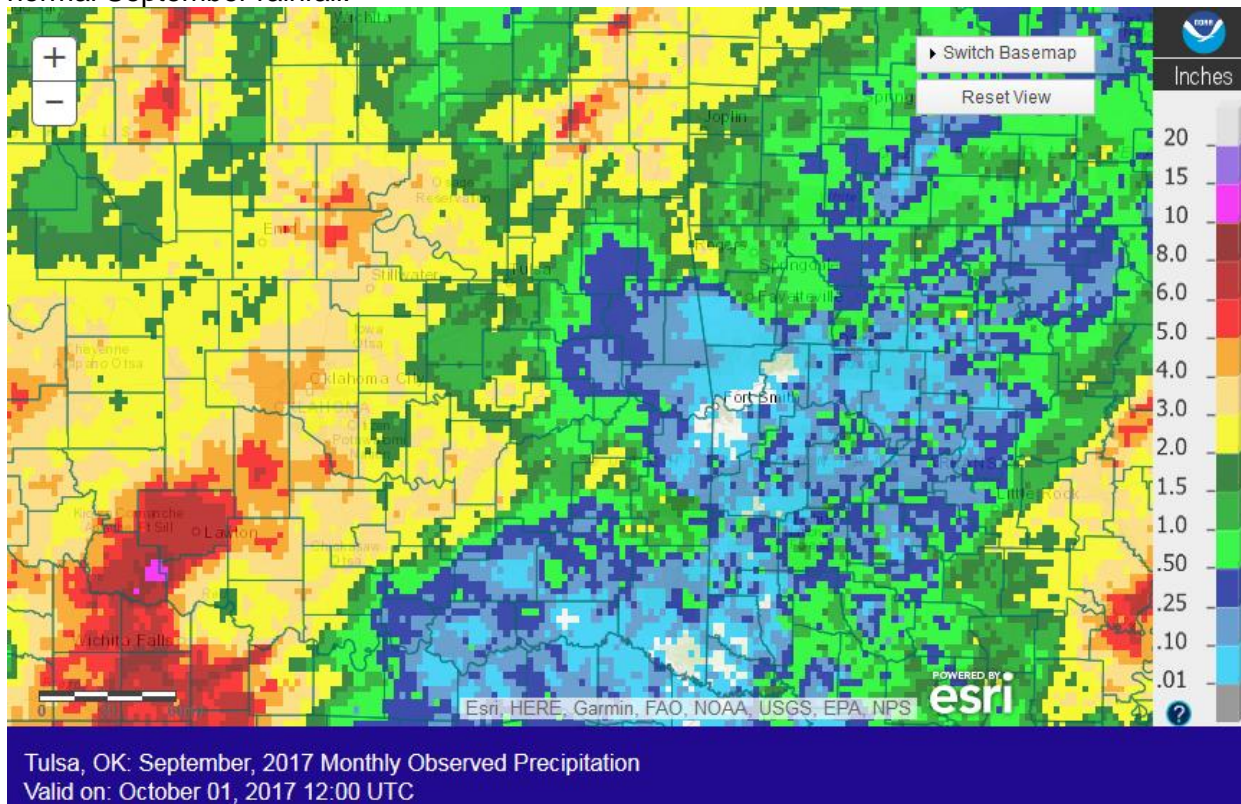


Fig. 1a. Estimated Observed Rainfall for September 2017

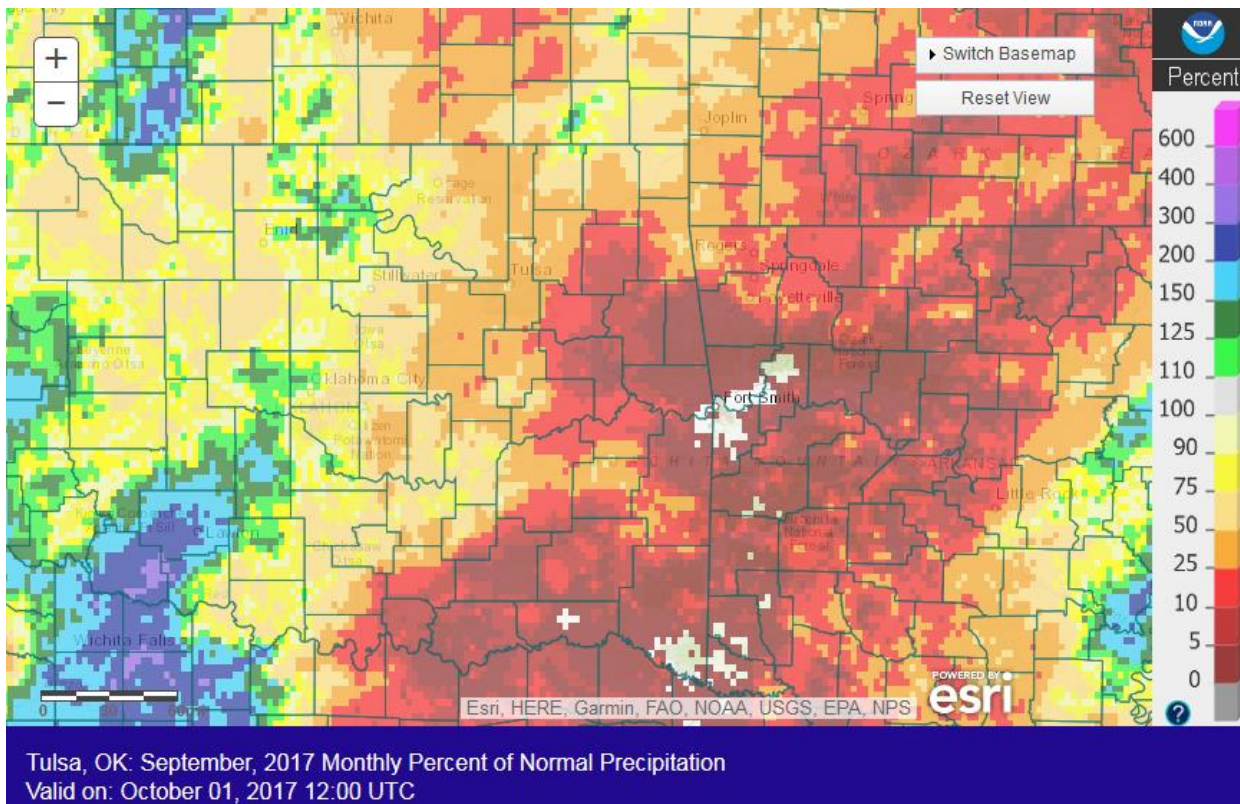


Fig. 1b. Estimated % of Normal Rainfall for September 2017

In Tulsa, OK, September 2017 ranked as the 43rd warmest September (75.0°F; since records began in 1905) and the 34th driest September (1.80"; since records began in 1888). Fort Smith, AR had the 38th warmest September (76.0°F, tied 2010, 1914, 1898; since records began in 1882) and the Record driest September (Trace, previous record 0.05" in 1928; since records began in 1882). Fayetteville, AR had the 31st warmest (69.6°F, tied 1969) and the 10th driest (1.50") September since records began in 1949.

Some of the larger precipitation reports (in inches) for September 2017 included:

Pawnee, OK (meso)	4.34	Wilburton 9.4N, OK (coco)	3.57	Burbank, OK (meso)	3.56
Miami, OK (meso)	3.41	Ralston, OK (coop)	3.40	Wynona, OK (meso)	3.26
Pawnee, OK (coop)	3.15	Drumright 0.6SW, OK (coco)	3.14	Tulsa 6.3WSW, OK (coco)	2.78

Some of the lowest precipitation reports (in inches) for September 2017 included:

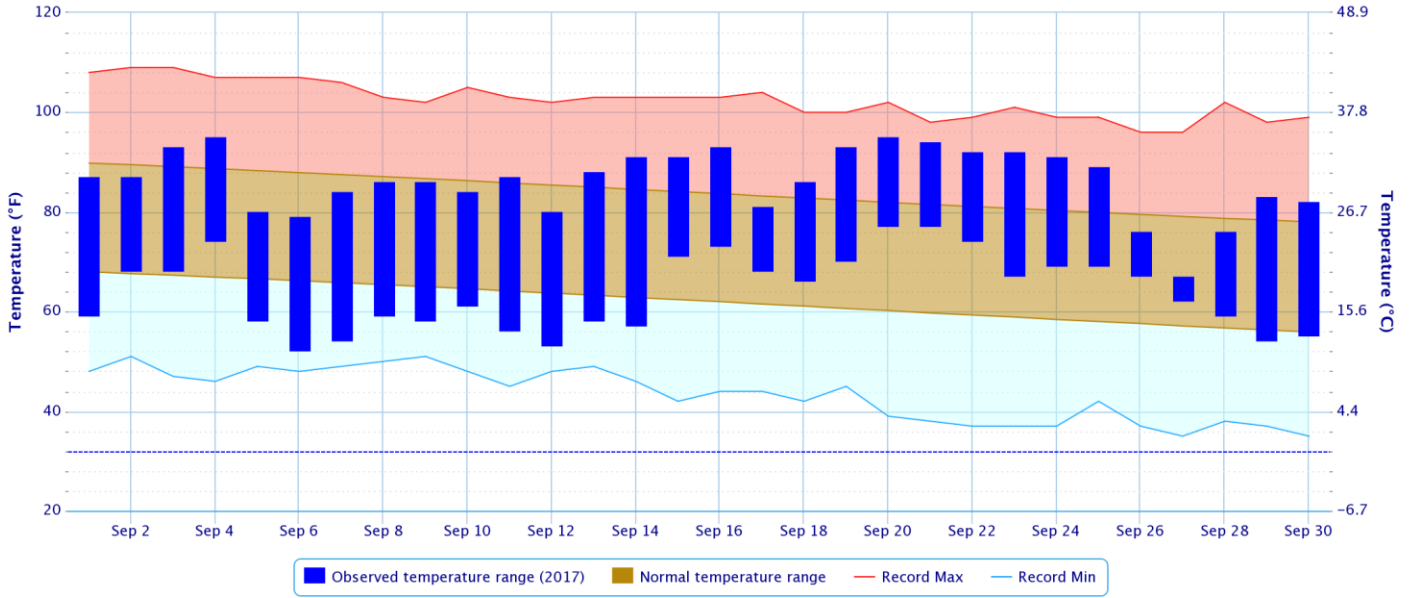
Cloudy, OK (meso)	0.00	Hugo, OK (meso)	0.00	Ozark, AR (coop)	0.00
Fort Smith, AR (ASOS)	Trace	Muskogee, OK (ASOS)	Trace	Wister, OK (meso)	0.05
Clayton, OK (meso)	0.09	Westville, OK (meso)	0.10	Cookson, OK (meso)	0.15

According to mesonet station only statistics from the [Oklahoma Climatological Survey \(OCS\) Mesonet](#):

Rank since 1921	September 2017	Last 60 Days (Aug 2 – Sep 30)	Last 90 Days (Jul 3 – Sep 30)	Last 120 Days (Jun 3 – Sep 30)	Last 180 Days (Apr 4 – Sep 30)	Year-to-Date (Jan 1 – Sep 30)	Water Year 2017 (Oct 1, 2016 – Sep 30, 2017)
Northeast OK	18 th driest	35 th wettest	49 th wettest	44 th driest	14 th wettest	12 th wettest	19 th wettest
East Central OK	8 th driest	22 nd wettest	28 th wettest	20 th wettest	6 th wettest	9 th wettest	32 nd wettest
Southeast OK	1 st driest	30 th wettest	15 th wettest	12 th wettest	22 nd wettest	25 th wettest	38 th driest
Statewide	33 rd driest	9 th wettest	15 th wettest	24 th wettest	12 th wettest	10 th wettest	28 th wettest

Daily Temperature Data – Tulsa Area, OK (ThreadEx)

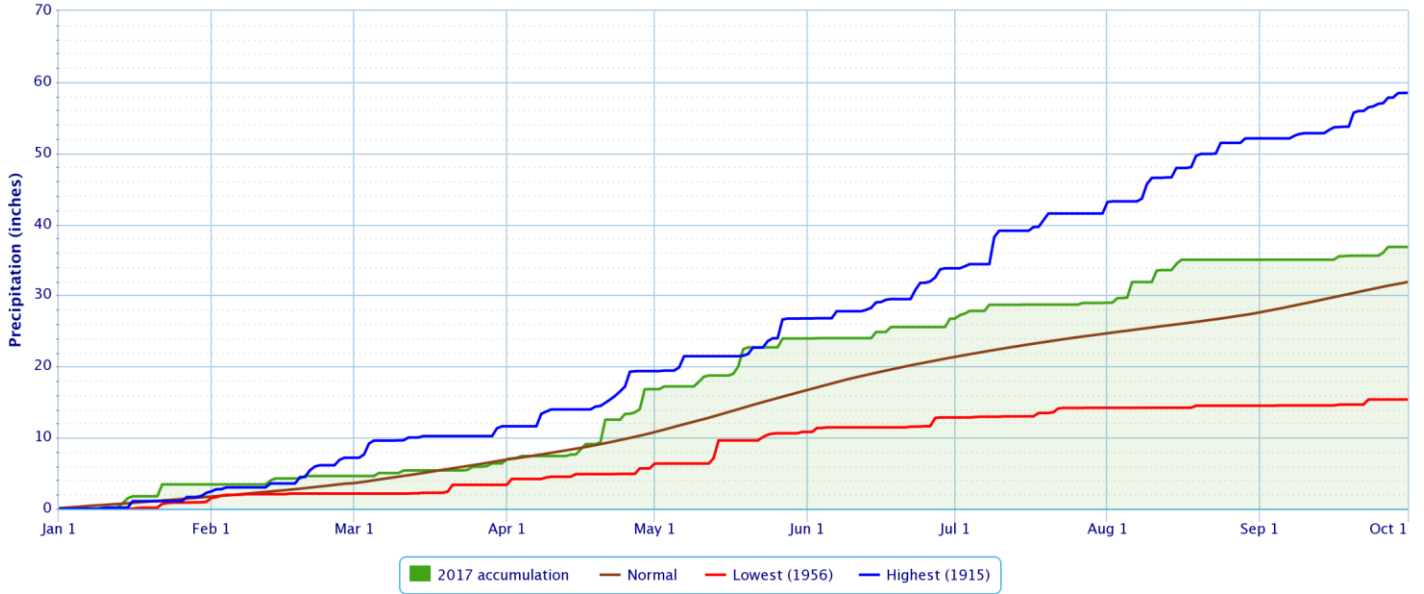
Period of Record – 1905-01-06 to 2017-10-01. Normals period: 1981-2010. Click and drag to zoom chart.



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Accumulated Precipitation – Tulsa Area, OK (ThreadEx)

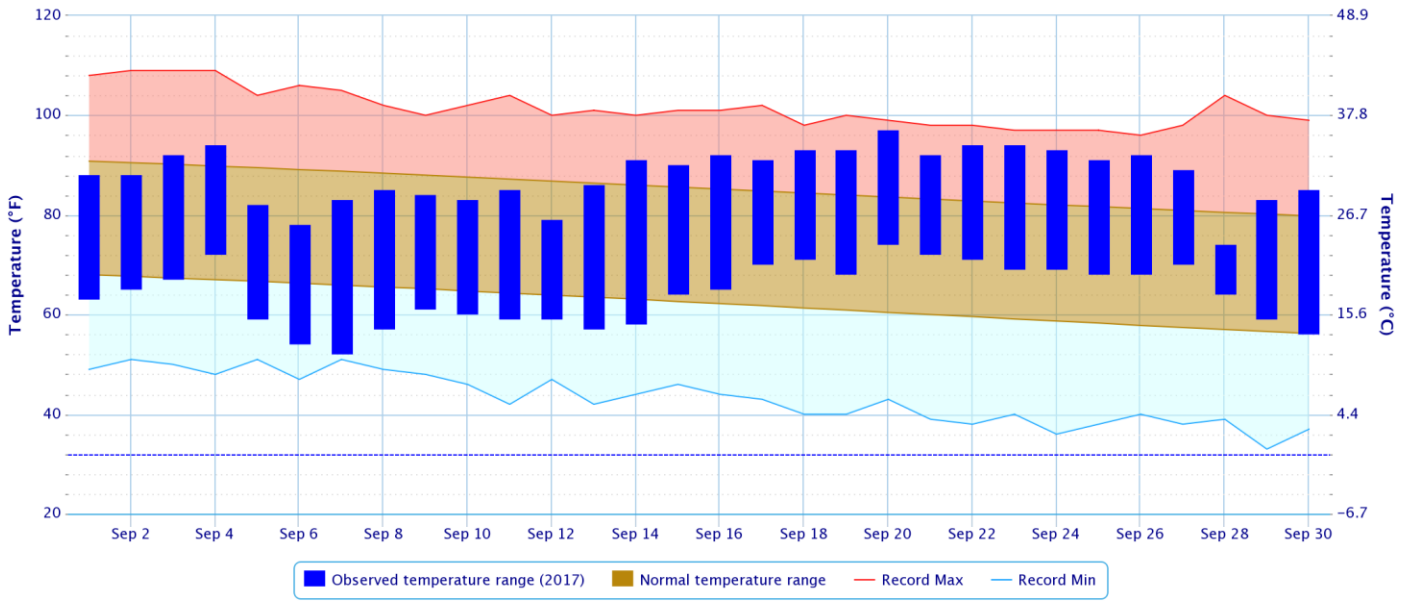
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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

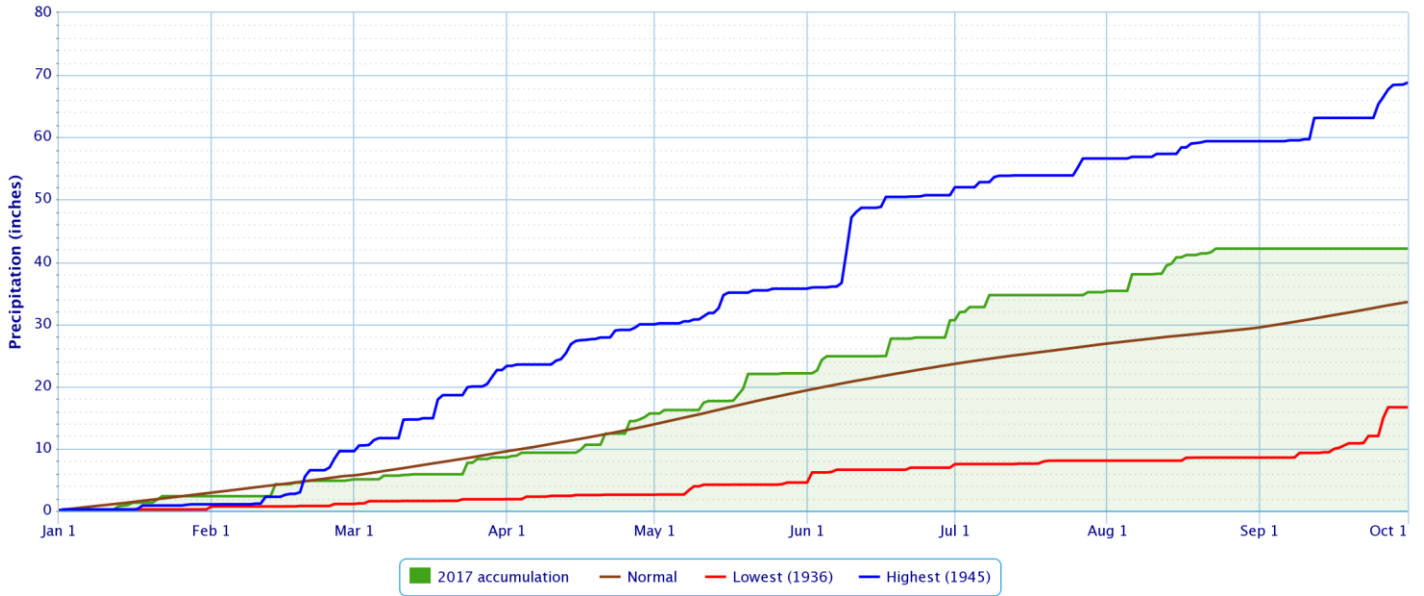
Period of Record – 1882-06-01 to 2017-10-01. Normals period: 1981-2010. Click and drag to zoom chart.



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Accumulated Precipitation – Fort Smith Area, AR (ThreadEx)

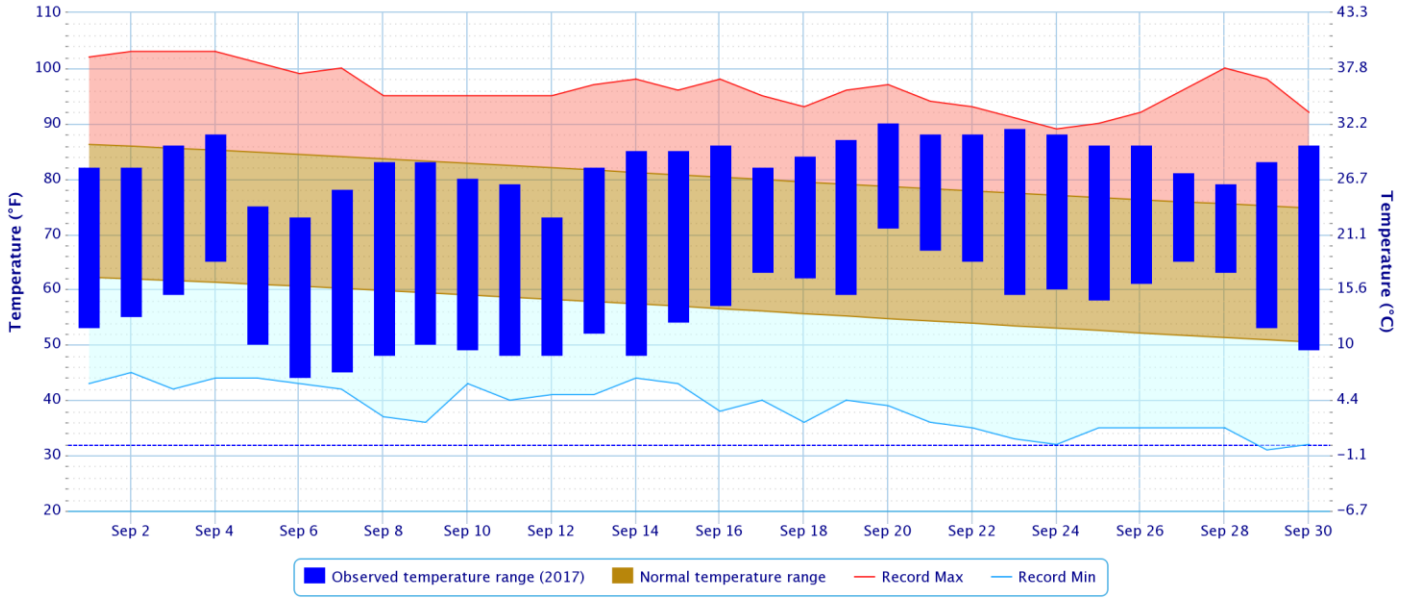
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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Daily Temperature Data – FAYETTEVILLE DRAKE FLD, AR

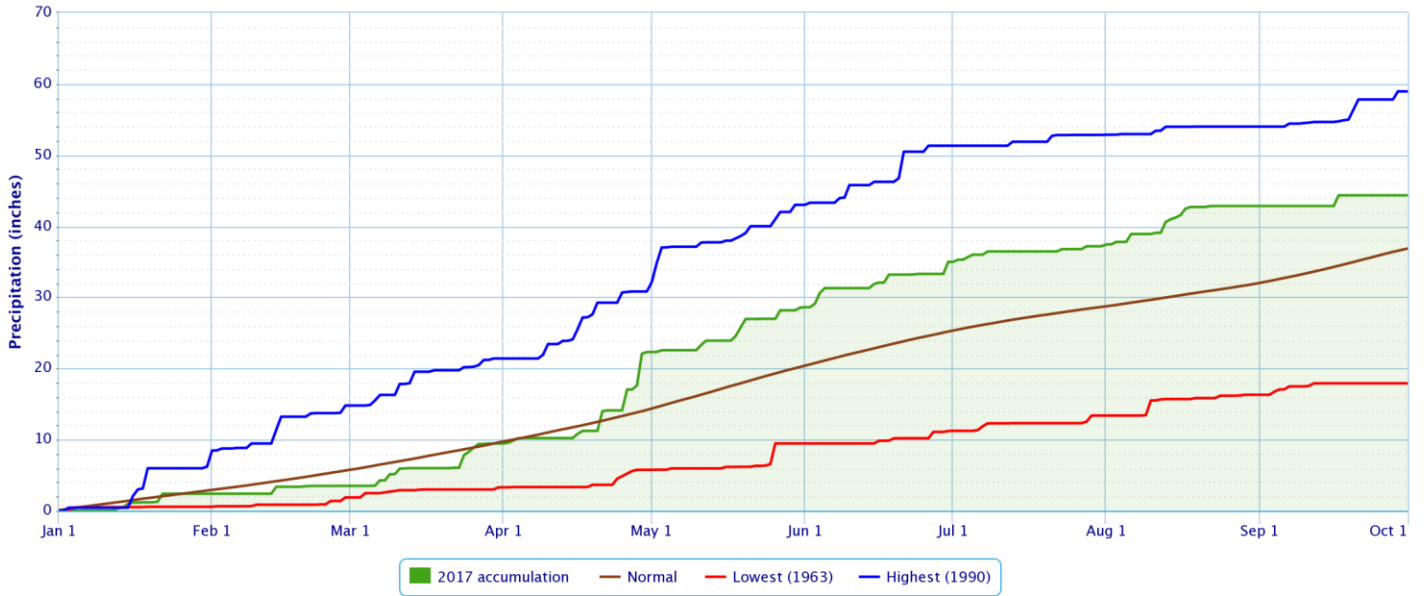
Period of Record – 1949-07-14 to 2017-10-01. Normals period: 1981-2010. Click and drag to zoom chart.



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Accumulated Precipitation – FAYETTEVILLE DRAKE FLD, AR

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

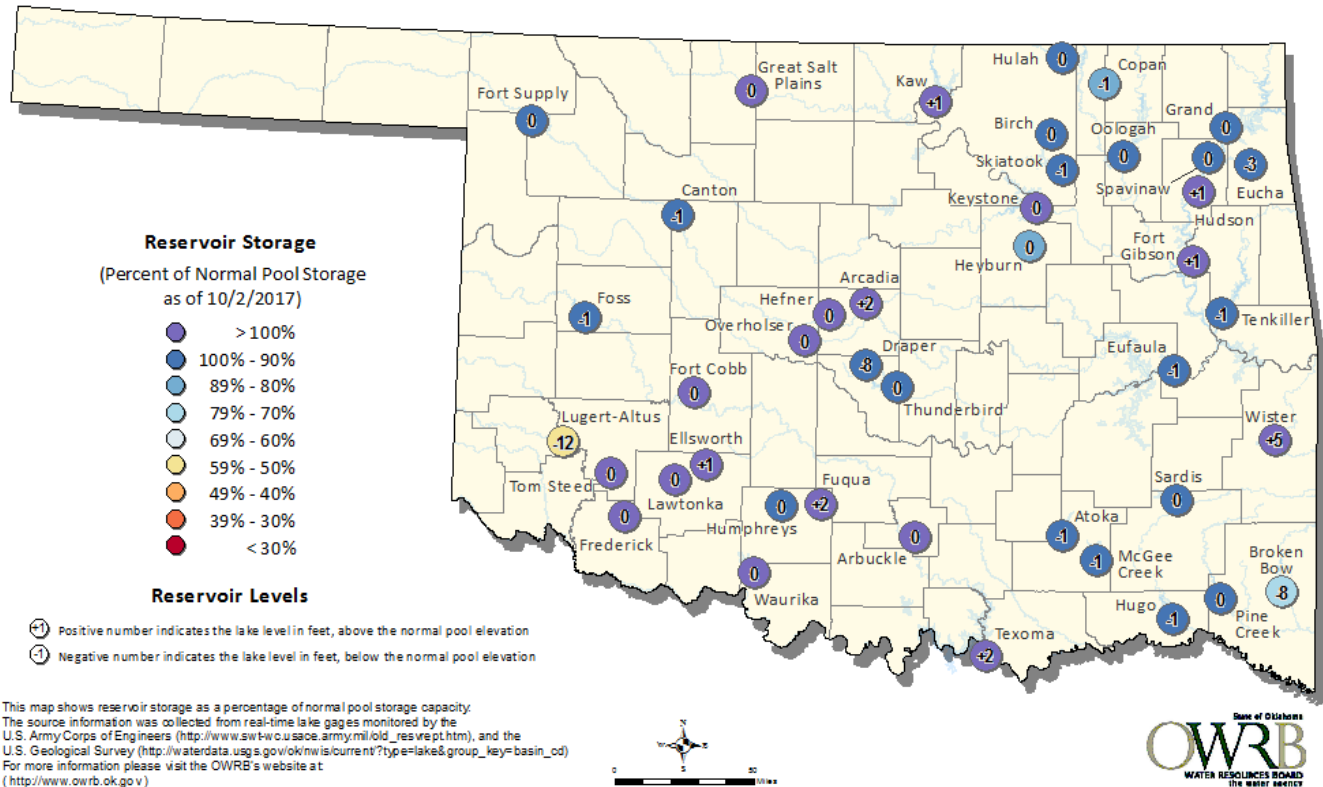


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Reservoirs

Oklahoma Surface Water Resources

Reservoir Levels and Storage as of 10/2/2017



According to the USACE, the most of the lakes in the HSA were at near normal levels as of 10/02/2017. Beaver Lake was operating at 106% of its conservation pool and Wister Lake was operating at 111% of its conservation pool. A few reservoirs were operating at more than 3% below the top of their conservation pools: Copan Lake 89%, Heyburn Lake 89%, Hugo Lake 90%, Hulah Lake 93%, and Eufaula Lake 96%.

Drought

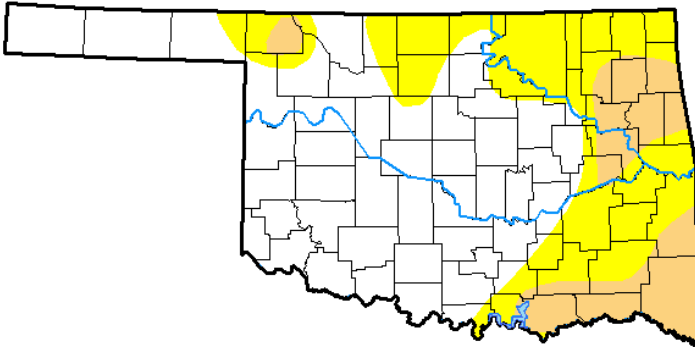
According to the [U.S. Drought Monitor](#) (USDM) from October 3, 2017 (Figs. 2, 3), D1 (Moderate) drought conditions were present across portions of Rogers, Mayes, Delaware, Wagoner, Cherokee, Adair, Muskogee, McIntosh, Le Flore, Pushmataha, and Choctaw Counties in eastern OK and Benton, Carroll, Washington, Madison, and Sebastian Counties in northwest AR. D0 (Abnormally Dry but not in drought) conditions were occurring over portions of all counties in eastern OK and northwest AR except Creek, Okfuskee, and Okmulgee Counties.

U.S. Drought Monitor Oklahoma

October 3, 2017
(Released Thursday, Oct. 5, 2017)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	57.90	42.10	14.10	0.00	0.00	0.00
Last Week 09-26-2017	64.46	35.54	0.77	0.00	0.00	0.00
3 Months Ago 07-04-2017	56.58	43.42	10.57	0.01	0.00	0.00
Start of Calendar Year 01-03-2017	5.61	94.39	83.21	55.75	5.55	0.00
Start of Water Year 09-26-2017	64.46	35.54	0.77	0.00	0.00	0.00
One Year Ago 10-04-2016	46.14	53.86	20.15	5.15	0.00	0.00



Intensity:

- 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. See accompanying text summary for forecast statements.

Author:

Anthony Artusa
NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

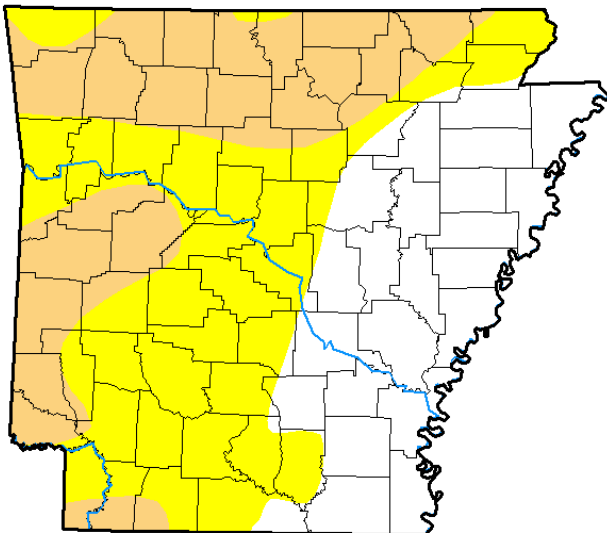
Fig. 2. Drought Monitor for Oklahoma

U.S. Drought Monitor Arkansas

October 3, 2017
(Released Thursday, Oct. 5, 2017)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	32.06	67.94	29.13	0.00	0.00	0.00
Last Week 09-26-2017	39.57	60.43	0.46	0.00	0.00	0.00
3 Months Ago 07-04-2017	98.95	1.05	0.00	0.00	0.00	0.00
Start of Calendar Year 01-03-2017	27.05	72.95	39.03	7.99	2.02	0.00
Start of Water Year 09-26-2017	39.57	60.43	0.46	0.00	0.00	0.00
One Year Ago 10-04-2016	56.89	43.11	0.00	0.00	0.00	0.00



Intensity:

- 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. See accompanying text summary for forecast statements.

Author:

Anthony Artusa
NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

Fig. 3. Drought Monitor for Arkansas

Water Year 2017 (October 1, 2016-September 30, 2017) Summary

Using the radar-derived estimated observed precipitation from the RFCs (Fig. 4a), rainfall totals for Water Year 2017 ranged from around 35" to around 60". The majority of the area received 40"-50". This corresponds to 75% to 150% across the counties that border KS and a few areas elsewhere, while the majority of eastern OK and northwest AR was 50% to 100% of the normal water year rainfall (Fig. 4b).

Some of the larger precipitation reports (in inches) for Water Year 2017 included (excluding Mesonet sites):

Springdale 6.4WSW, AR (coco)	60.80	Holiday Island 1.3SSW, AR (coco)	59.22	Hindsville 10NNE, AR (coop)	59.04
Farmington 0.6WSW, AR (coco)	58.08	Hindsville 7.1NW, AR (coco)	58.03	Eureka Springs 4.0NNW, AR (coco)	57.34
Jay 3.3NNE, OK (coco)	57.28	Winslow 7NE, AR (coop)	56.80	Rogers 2.1SE, AR (coco)	56.76

Some of the smaller precipitation reports (in inches) for Water Year 2017 included (excluding Mesonet sites; includes site with ≤ 3 missing days):

Antlers 5NW, OK (coop)	39.79	Jenks Riverside Arpt, OK (ASOS)	40.83	Tulsa 3.4ENE, OK (coco)	41.00
Tulsa, OK (ASOS)	41.98	McAlester, OK (ASOS)	42.96	Spavinaw, OK (coop)	43.12
Broken Arrow 1.5WSW, OK (coco)	44.09	Fort Smith, AR (ASOS)	44.87	Broken Arrow 2.2SW, OK (coco)	46.24

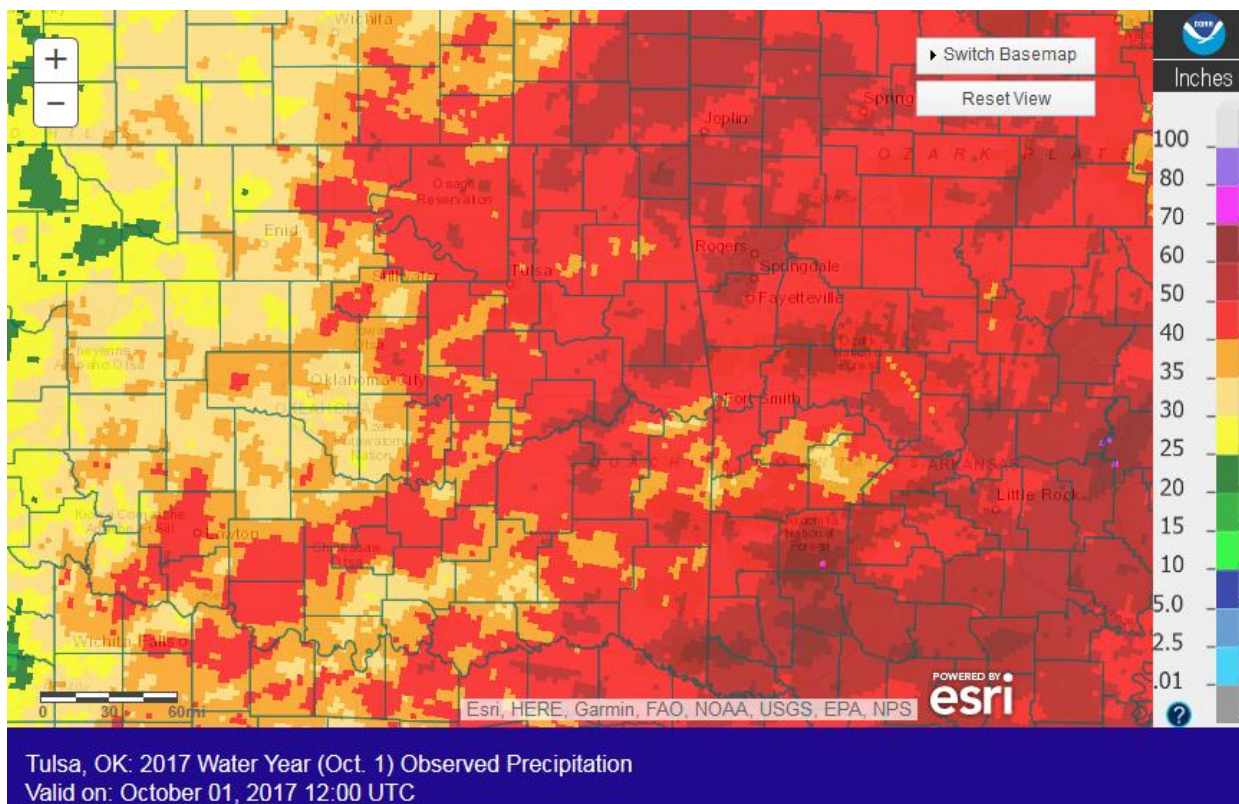


Fig. 4a. Estimated Observed Rainfall for Water Year 2017

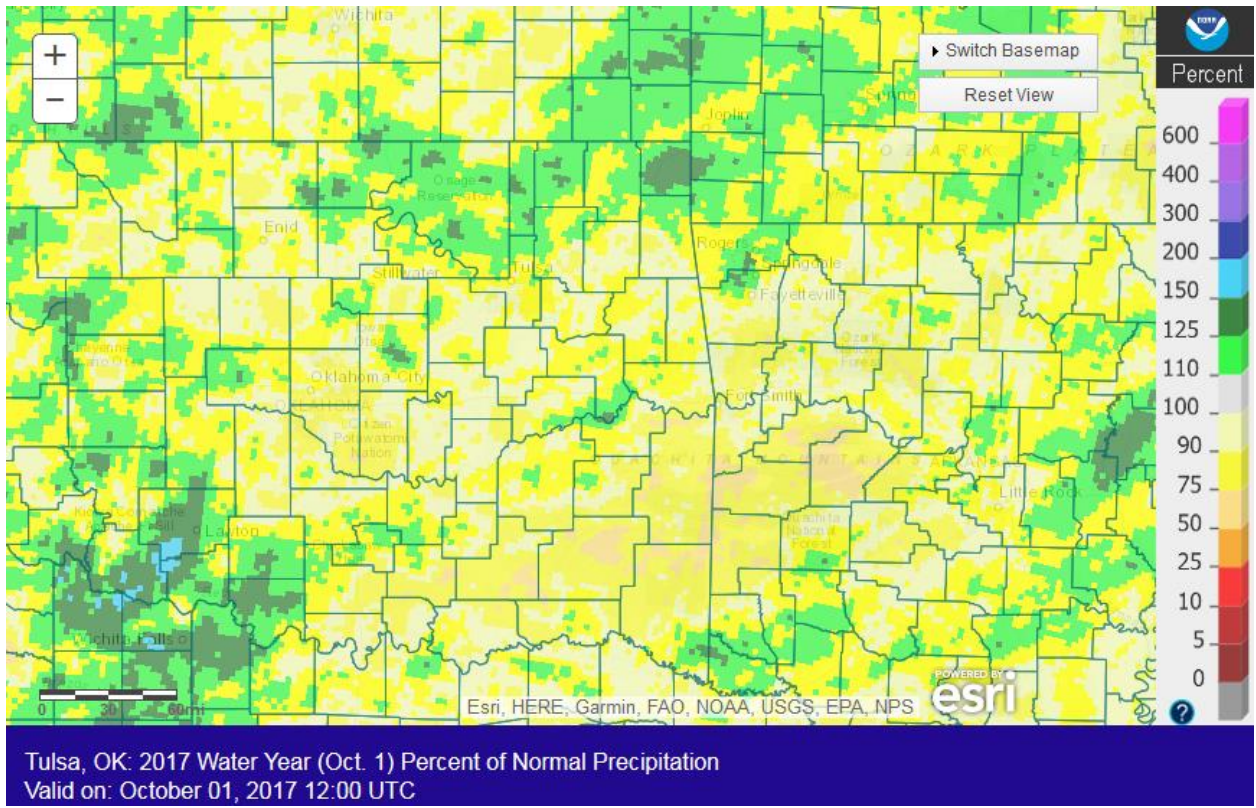
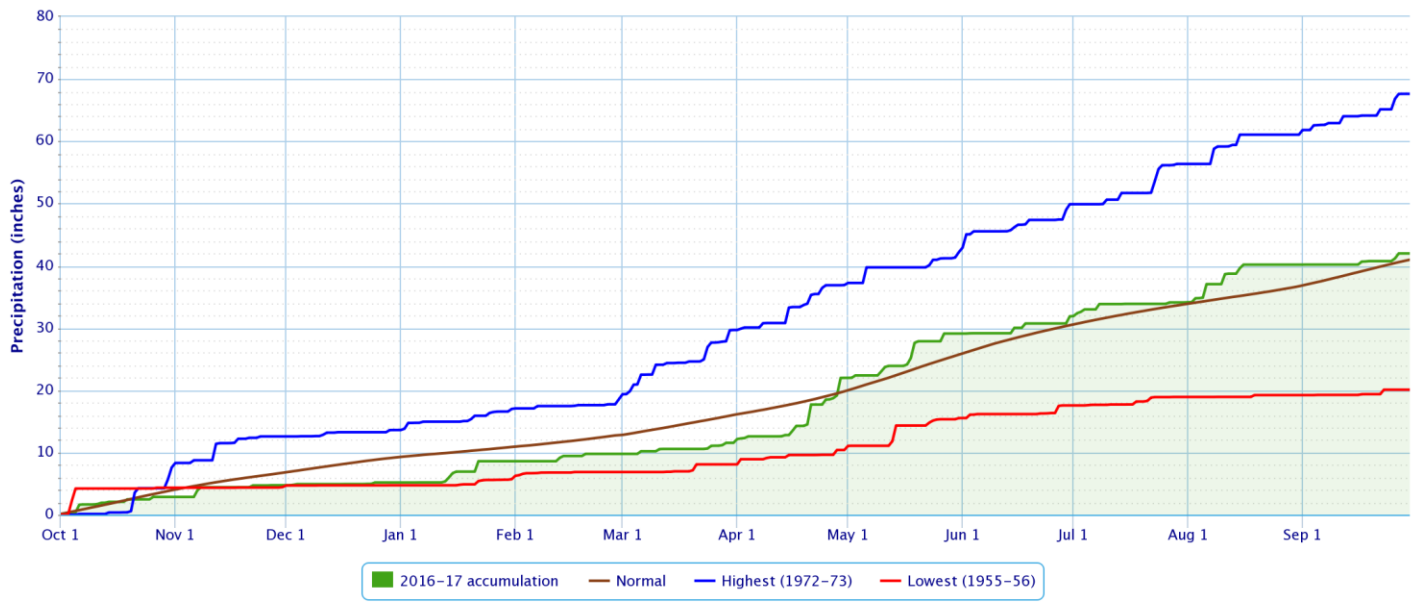


Fig. 4b. Estimated % of Normal Rainfall for Water Year 2017

Accumulated Precipitation – Tulsa Area, OK (ThreadEx)

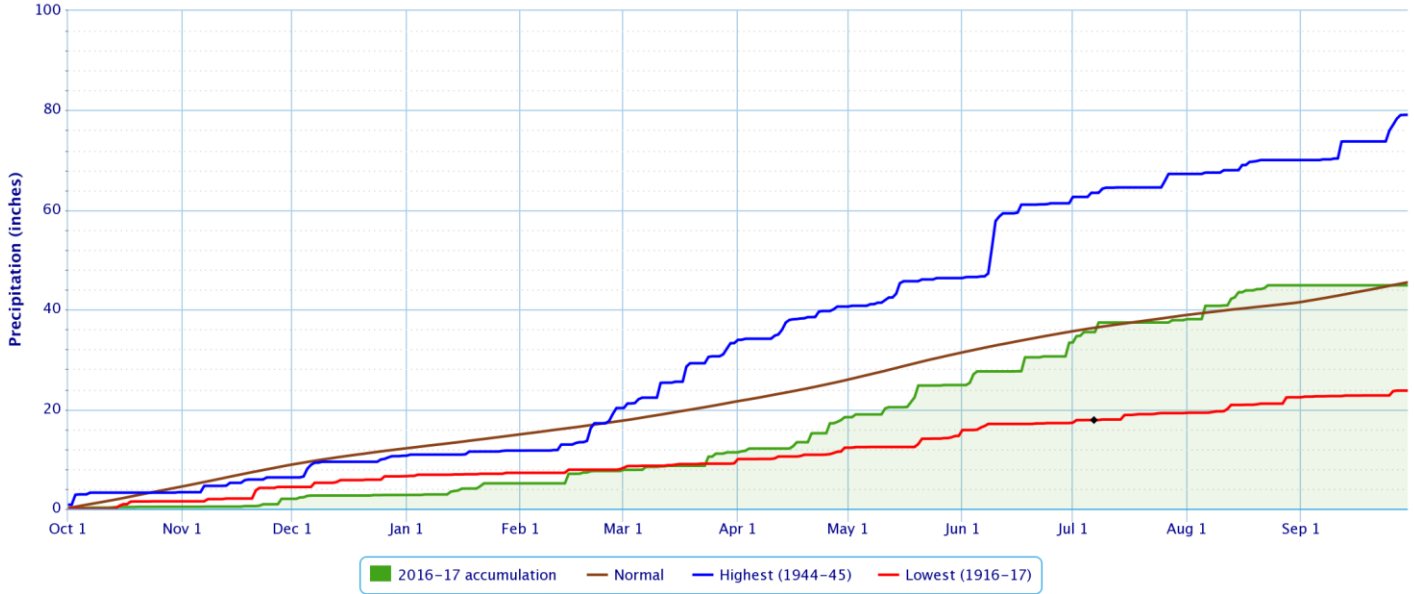
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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Accumulated Precipitation – Fort Smith Area, AR (ThreadEx)

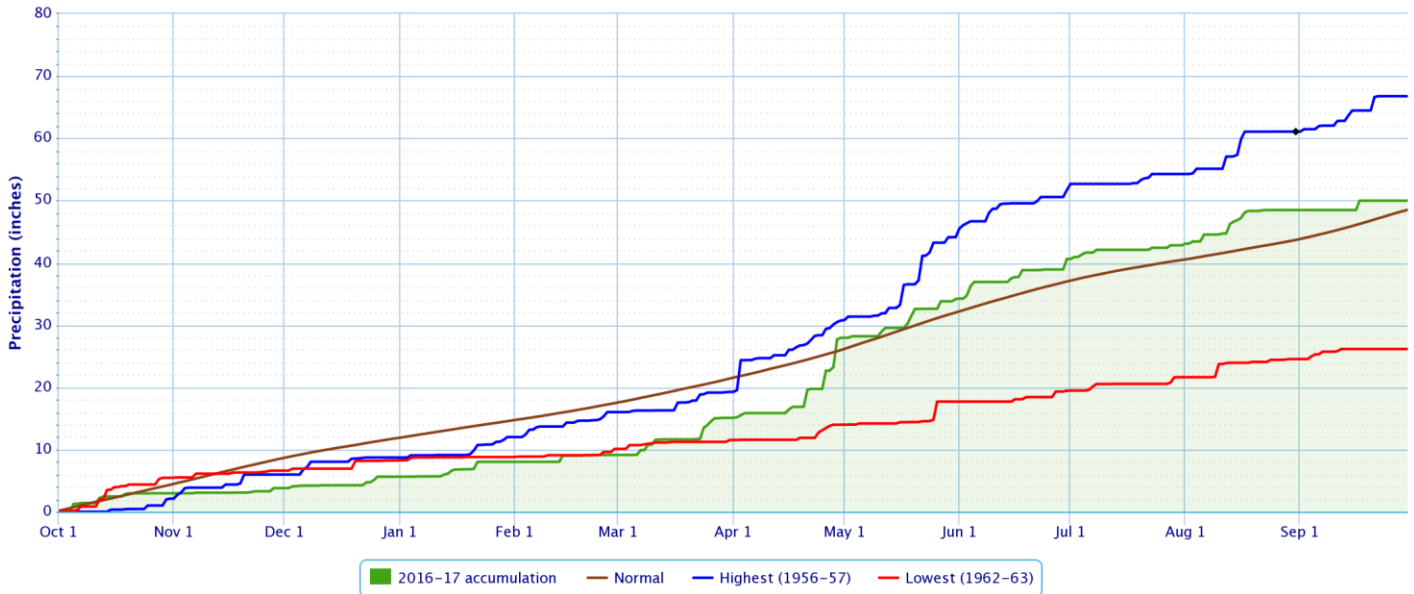
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



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Accumulated Precipitation – FAYETTEVILLE DRAKE FLD, AR

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



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Outlooks

The [Climate Prediction Center](#) (CPC) outlook for October 2017 (issued September 30, 2017) indicates an enhanced chance for above normal temperatures and below median precipitation across all of eastern OK and northwest AR. This outlook takes into account weather conditions forecast over the next 1-2 weeks and subseasonal climate signals in the weeks 3-4 time frame. It is based on bias-corrected and calibrated dynamical model guidance spanning multiple time scales and to a lesser extent, considerations from long term trends.

For the 3-month period October-November-December 2017, CPC is forecasting an enhanced chance for above normal temperatures and a slightly enhanced chance for below median rainfall across all of eastern OK and northwest AR (outlook issued September 21, 2017). This outlook is based on both statistical and dynamical forecast tools and decadal timescale climate trends, as well as a slight tilt toward La Niña influence. According to CPC, Pacific sea surface temperatures along the equator continue to indicate ENSO-neutral conditions. ENSO-neutral is expected to persist through autumn, with increasing chances for a transition to La Niña later in the autumn and winter 2017-18. CPC has issued a 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

Overall, rainfall activity was not significant this month across eastern OK and northwest AR, with most rain events producing less than 3" of rain. However, showers and thunderstorms developed along a stalled cold front near the OK/KS border and brought 2"-4" of rain to far northeast OK on the 17th (Fig. 5).

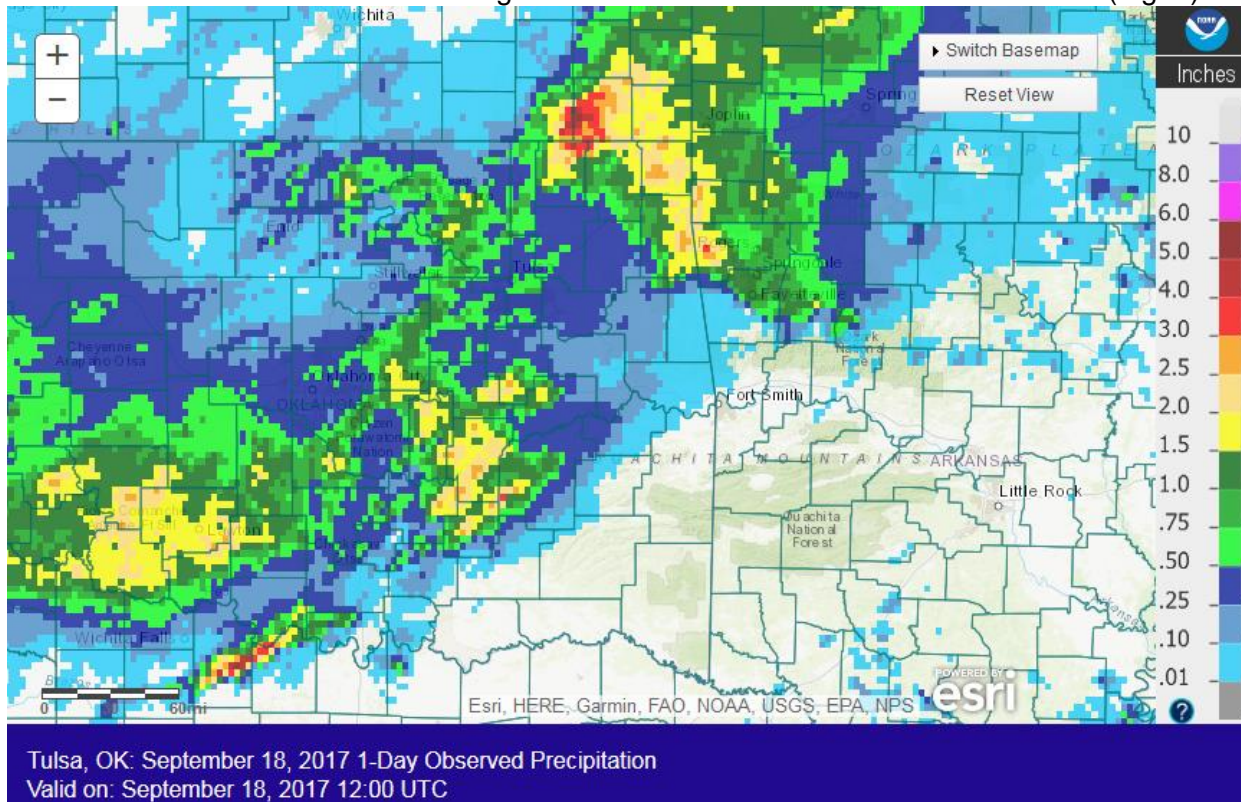


Fig. 5. 24-hour Estimated Observed Rainfall ending at 7am CDT 9/18/2017.

Written by:

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Service Hydrologist
WFO Tulsa

Products issued in September 2017:

- *CWYO2 became a daily river forecast point September 7, 2016
- *MLBA4 and OZGA4 transferred to NWS Tulsa HSA February 5, 2014
- *Mixed case River Flood products began July 31, 2013
 - 0 Flash Flood Warnings (FFW)
 - 0 Flash Flood Statements (FFS)
 - 0 Flash/Areal Flood Watches (FFA) (0 Watch FFA CON/EXT/EXA/EXB/CAN)
 - 2 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) (8 Advisory FLS CON/EXT/CAN)
 - 0 River Flood Watches (FFA) (0 Watch FFA CON/EXT/CAN)
 - 0 River Statements (RVS)
 - 0 Hydrologic Outlooks (ESF)
 - 0 Drought Information Statements (DGT)

Preliminary Hydrographs:

None