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 **2019**
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 20, 2019**

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.**

Heavy rain resulted in both flash flooding and river flooding this month. Portions of eastern OK and northwest AR received more than 8" above their normal October rainfall this month. 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 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 October 2019 ranged from 2" to around 20" across eastern OK and northwest AR. Areas northwest of a line from Pawnee to Nowata received 2"-4", with 5"-15" for much of the area southeast of that line. The greatest rainfall totals of 10"-20" affected areas from east central OK into northwest AR. These rainfall totals correspond to 50%-100% of the normal October rainfall northwest of a Pawnee to Nowata line, and 150% to near 500% for much of the remainder of eastern OK and northwest Arkansas (Fig. 1b).

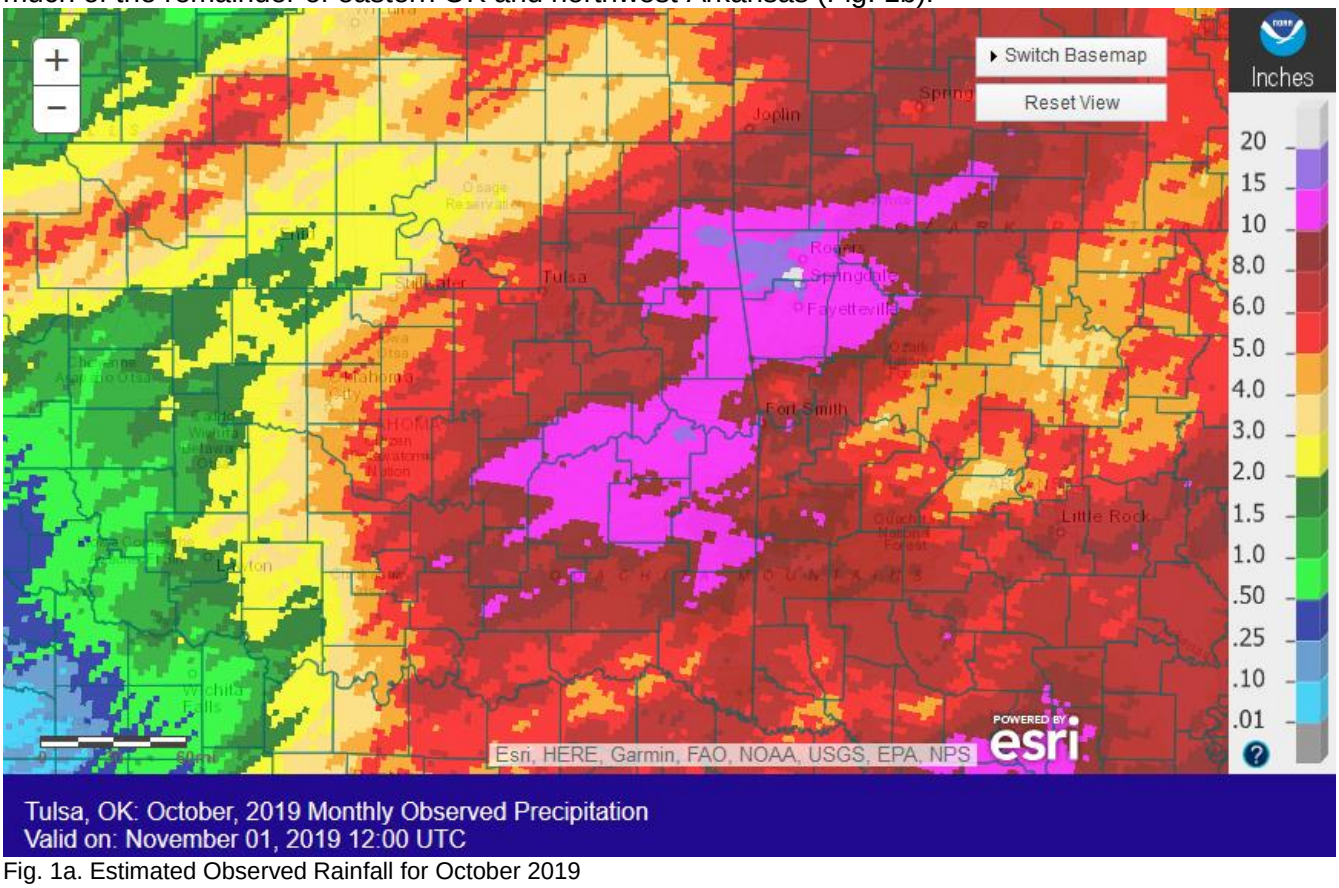


Fig. 1a. Estimated Observed Rainfall for October 2019

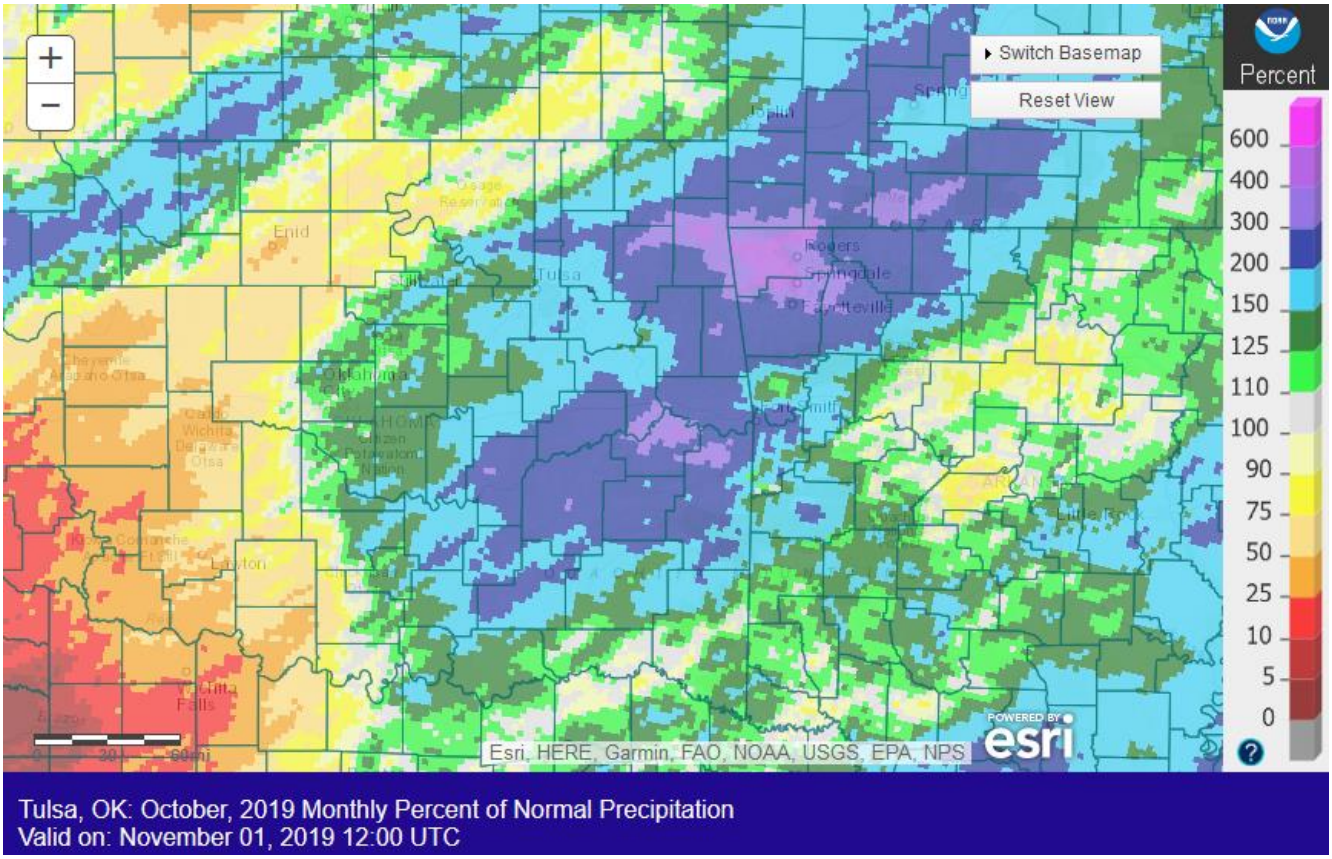


Fig. 1b. Estimated % of Normal Rainfall for October 2019

In Tulsa, OK, October 2019 ranked as the 6th coldest October (57.9°F; since records began in 1905) and the 24th wettest October (5.89"; since records began in 1888). A trace of snow fell, which ties as 2nd snowiest October on record with 1957, 1967, 1996, 2000 (since records began in 1900). Fort Smith, AR had the 45th coldest October (61.8°F; since records began in 1882) and the 5th wettest October (9.41"; since records began in 1882). No snow fell in Fort Smith this month. Fayetteville, AR had the 10th coldest (55.8°F, tied 1957), the Record wettest (12.07", previous record 10.69" in 2009), and 2nd snowiest (Trace, tied 1957, 1989, 1991, 1994, 1996) October since records began in 1949.

Some of the larger precipitation reports (in inches) for October 2019 included:

Decatur 2.6ESE, AR (coco)	19.19	Springdale 0.6E, AR (coco)	18.89	Pea Ridge 0.2WSW, AR (coco)	17.95
Gravette, AR (coop)	17.45*	Jay 3.3NNE, OK (coco)	16.64	Rogers 2.4SSW, AR (coco)	16.62
Upper Spavinaw Port, OK (coop)	15.97	Bella Vista 2.0E, AR (coco)	15.95	Jay, OK (meso)	15.80

*New record October rainfall for the Gravette COOP station. Previous record was 15.18" in 1941. Records began in 1898.

Some of the lowest precipitation reports (in inches) for October 2019 included:

Burbank, OK (meso)	2.26	Bartlesville, OK (ASOS)	3.11	Foraker, OK (meso)	3.62
Wynona, OK (meso)	3.87	Pawnee, OK (meso)	4.00	Copan, OK (meso)	4.04
Kingston 5NW, AR (coop)	4.48	Ochelata 5.6N, OK (coco)	4.50	Drumright 0.6SW, OK (coco)	4.69

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

Rank since 1921	October 2019	Autumn-to-Date (Sep 1 – Oct 31)	Last 90 Days (Aug 3 – Oct 31)	Last 120 Days (Jul 4 – Oct 31)	Last 180 Days (May 5 – Oct 31)	Year-to-Date (Jan 1 – Oct 31)	Last 365 Days (Nov 1, 2018 – Oct 31, 2019)
Northeast OK	**7th wettest**	14th wettest	**4th wettest**	**5th wettest**	**1st wettest**	**1st wettest**	**1st wettest**
East Central OK	**4th wettest**	**10th wettest**	**2nd wettest**	**4th wettest**	**2nd wettest**	**4th wettest**	**4th wettest**
Southeast OK	**6th wettest**	**7th wettest**	**7th wettest**	11th wettest	**4th wettest**	**9th wettest**	**6th wettest**
Statewide	16th wettest	25th wettest	**10th wettest**	19th wettest	**6th wettest**	**4th wettest**	**6th wettest**

According to the National Centers for Environmental Information (NCEI, Figs. 2a, b), the northeast Oklahoma climate division had an average of 57.95” of rain (20.78” above the 1981-2010 normal) for the 10-month period January through October, ranking as the wettest first 10 months of the year for that corner of the state (previous record was 52.64” in 2008). This 10-month total also broke the record annual rainfall, 57.82” from 1973, for northeast OK.

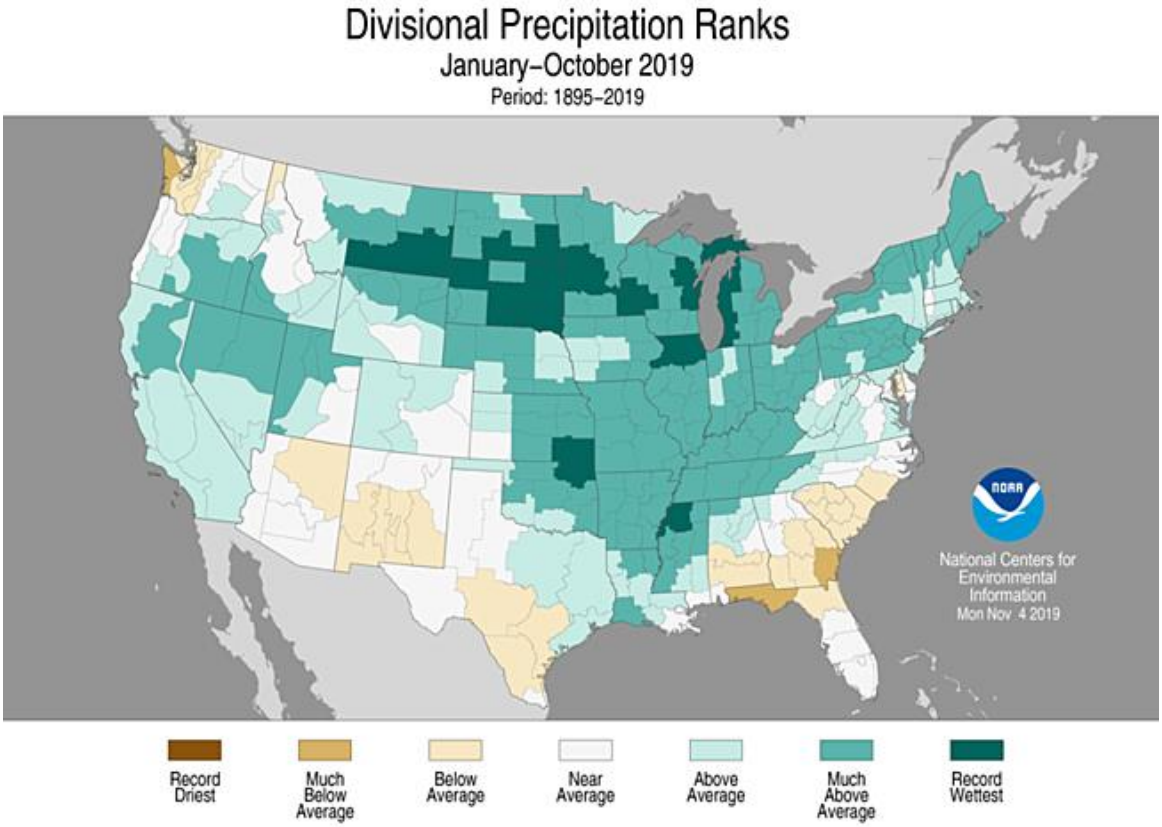


Fig. 2a. NCEI climate division precipitation rankings for the 10-month period January – October 2019.

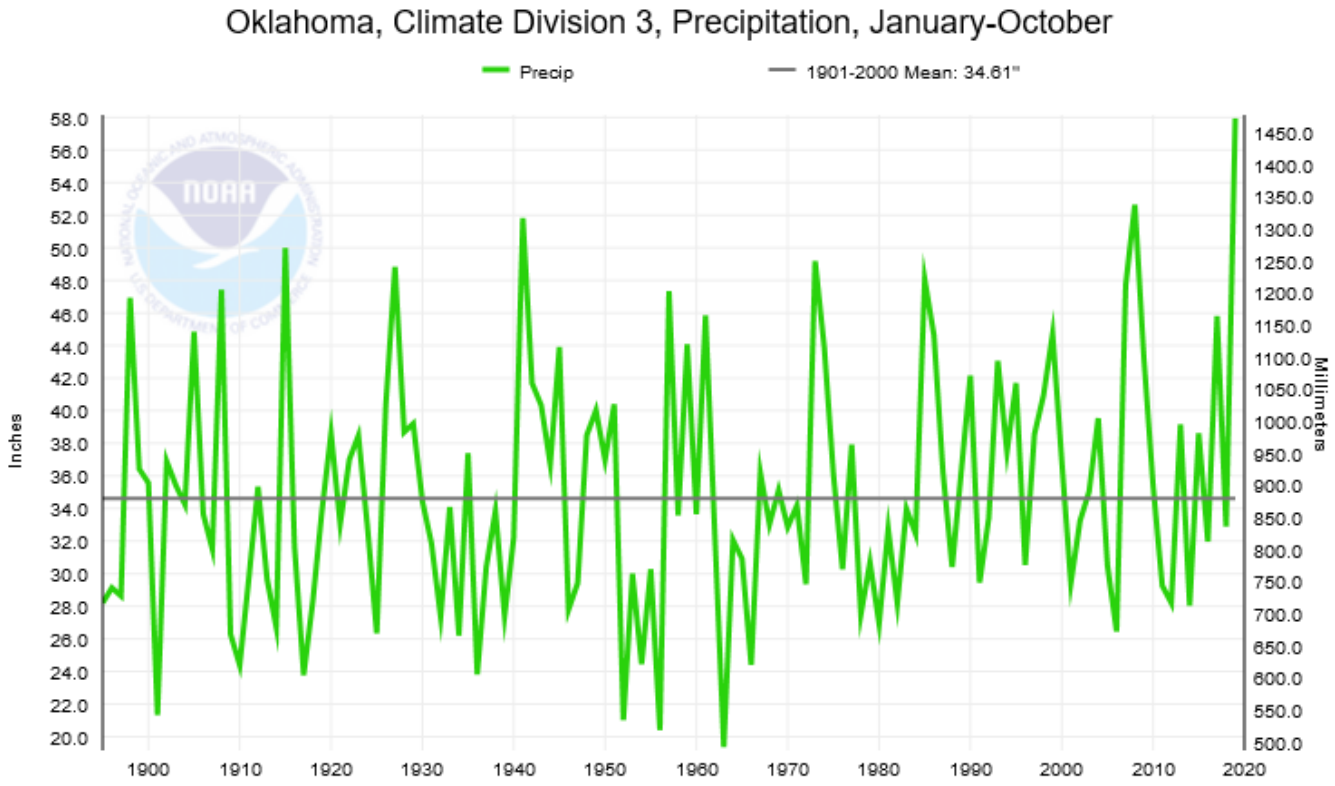
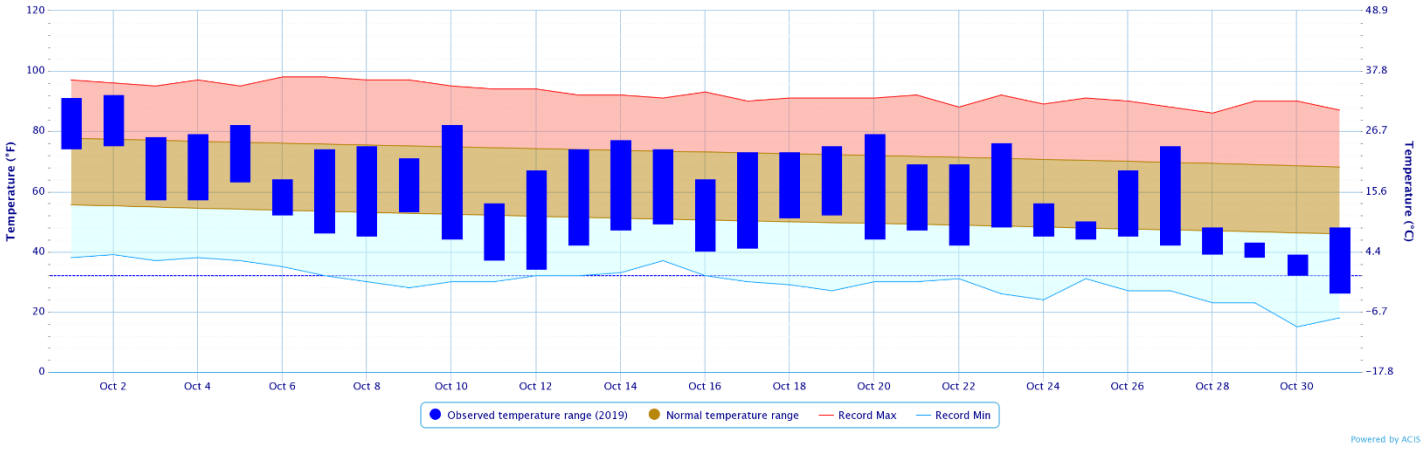


Fig. 2b. NCEI OK Climate Division 3 precipitation time series 1895-2019 for the 10-month period January – October.

Daily Temperature Data – Tulsa Area, OK (ThreadEx)

Period of Record – 1905-01-06 to 2019-11-05. Normals period: 1981-2010. Click and drag to zoom chart.



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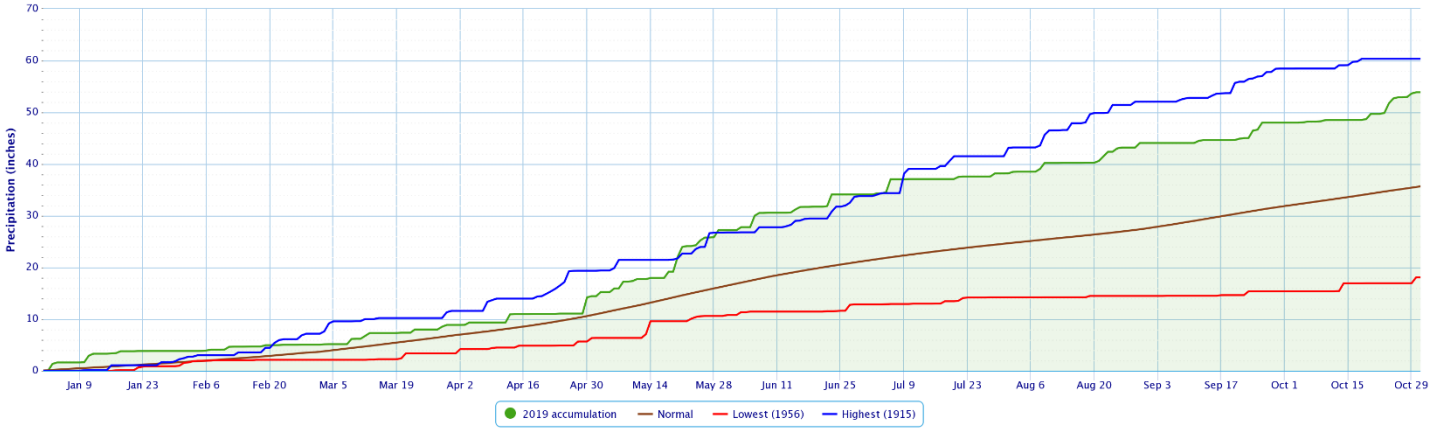
Accumulated Precipitation – Tulsa Area, OK (ThreadEx)

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



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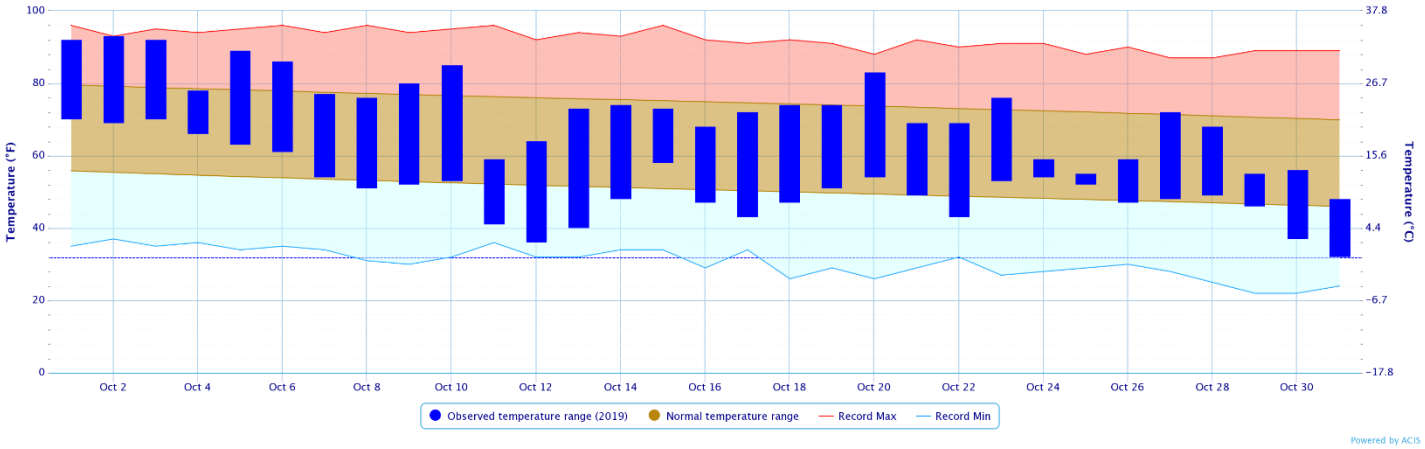
Daily Temperature Data – Fort Smith Area, AR (ThreadEx)

Period of Record – 1882-06-01 to 2019-11-05. Normals period: 1981-2010. Click and drag to zoom chart.



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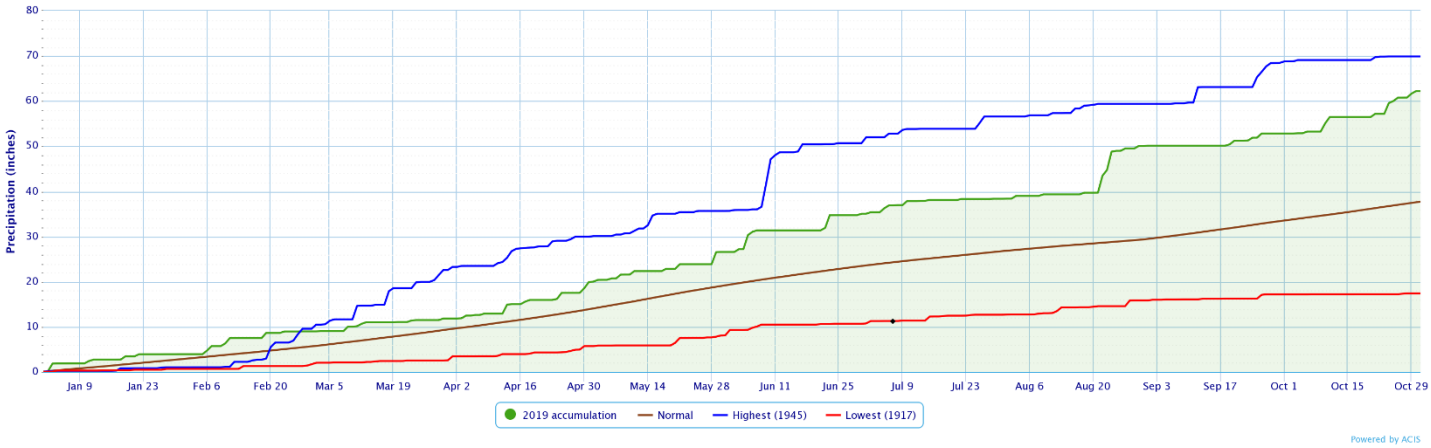
Accumulated Precipitation – Fort Smith Area, AR (ThreadEx)

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



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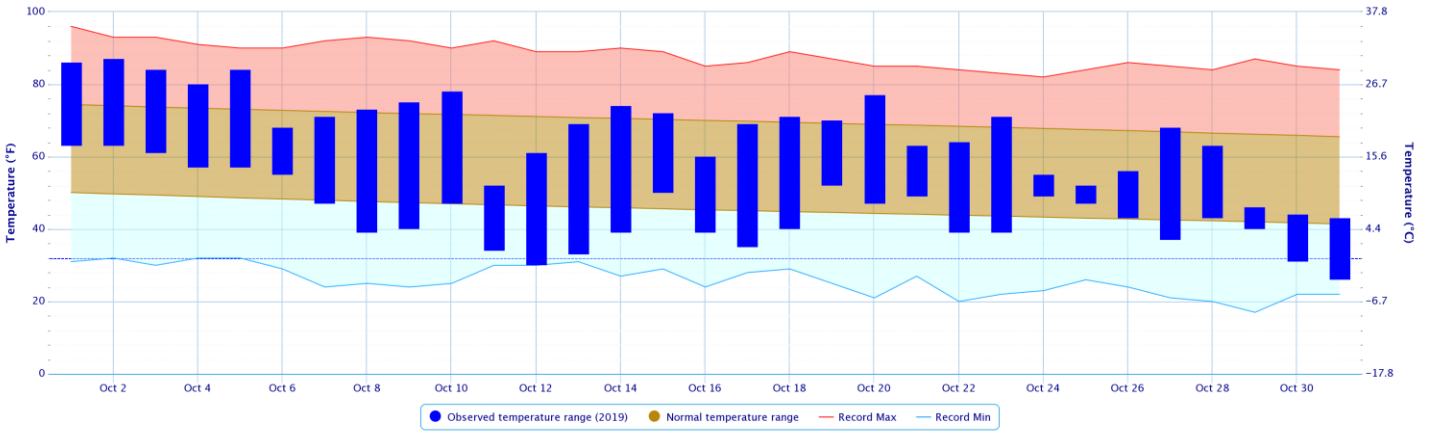
Daily Temperature Data – FAYETTEVILLE DRAKE FIELD, AR

Period of Record – 1949-07-14 to 2019-11-05. Normals period: 1981-2010. Click and drag to zoom chart.



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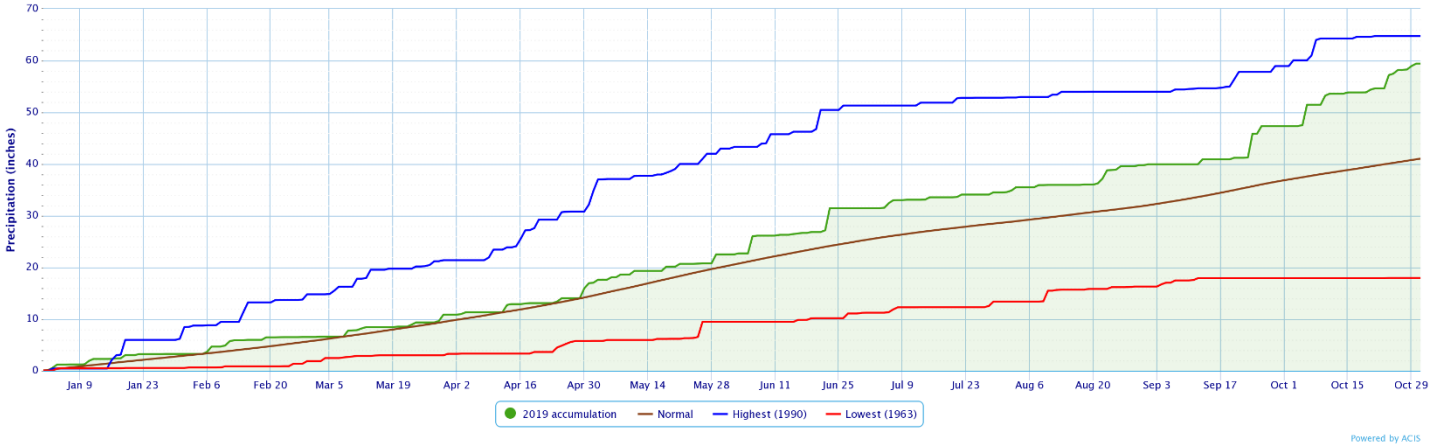
Accumulated Precipitation – FAYETTEVILLE DRAKE FIELD, AR

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



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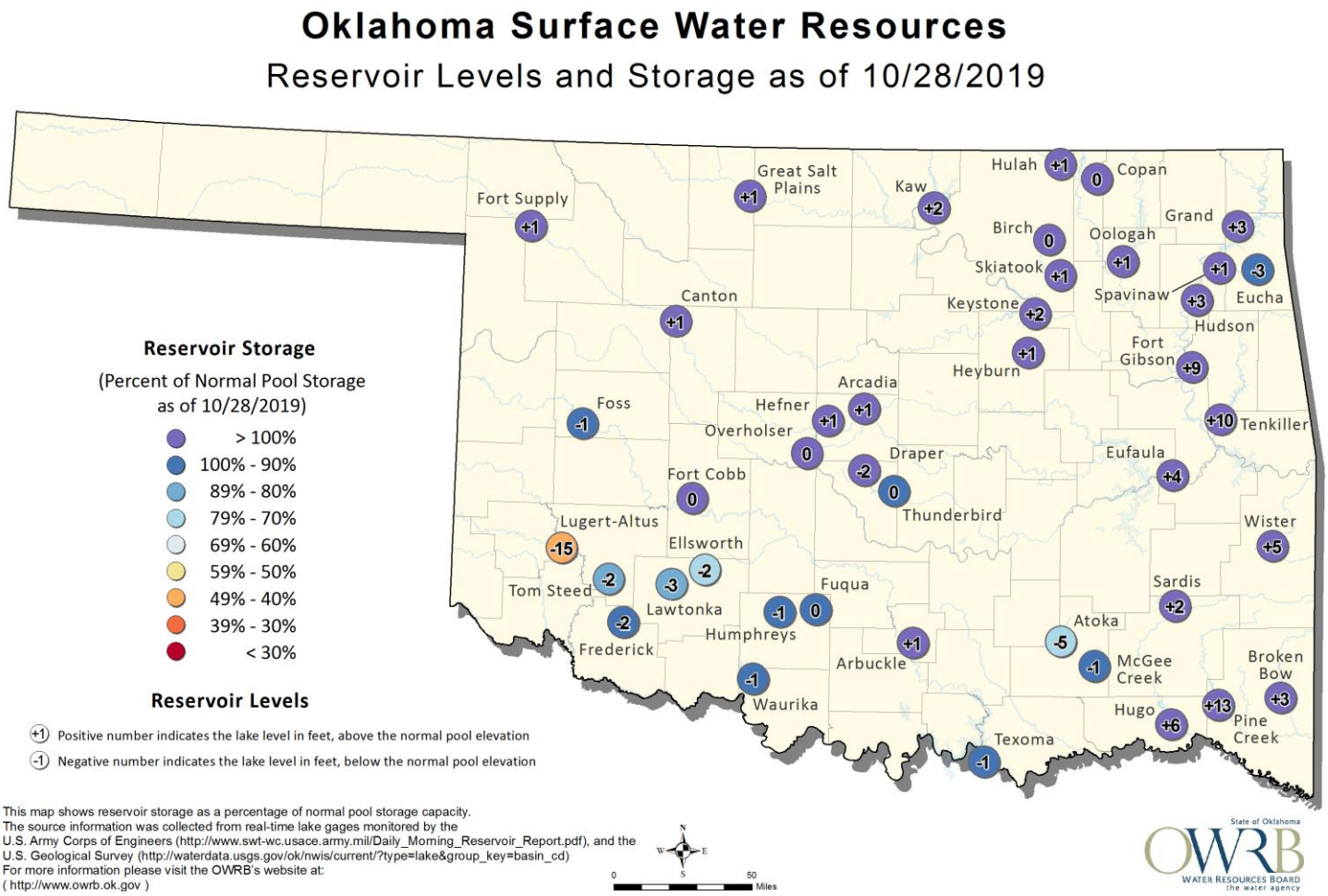
Reservoirs



According to the USACE, most of the lakes in the HSA were utilizing more than 3% of their flood control pools as of 10/31/2019: Beaver Lake 92%, Eufaula Lake 30%, Tenkiller Lake 26%, Sardis Lake 26%, Grand Lake 25%, Hudson Lake 23%, Ft. Gibson Lake 19%, Wister Lake 12%, Hugo Lake 11%, Skiatook Lake 9%, Oologah Lake 7%, and Keystone Lake 6%.

Drought

According to the U.S. Drought Monitor (USDM) from October 29, 2019 (Figs. 3a, b), Abnormally Dry, but not in drought, conditions (D0) were present in southern Choctaw County in eastern OK. The remainder of eastern OK and northwest AR was drought free.

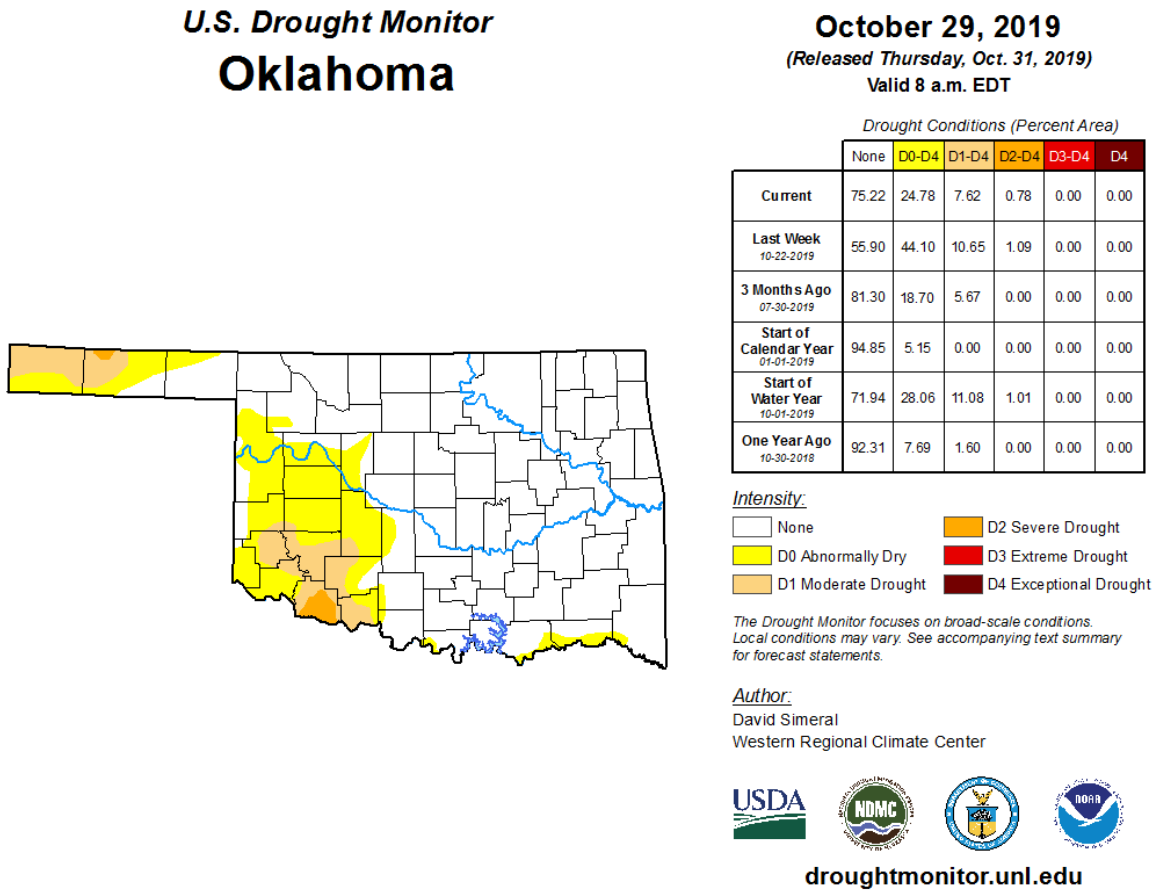


Fig. 3a. Drought Monitor for Oklahoma

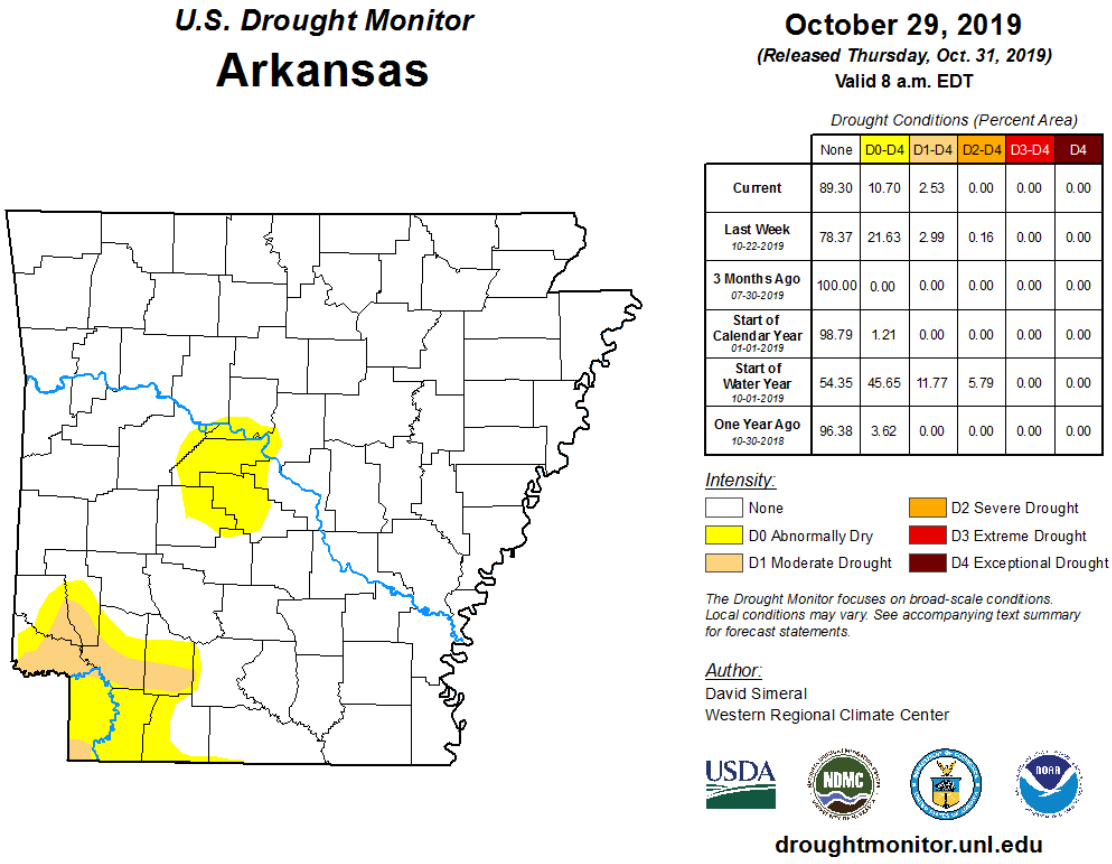


Fig. 3b. Drought Monitor for Arkansas

Outlooks

The Climate Prediction Center (CPC) outlook for November 2019 (issued October 31, 2019) indicates an enhanced chance for below normal temperatures and below median precipitation across all of eastern OK and northwest AR. This outlook takes into account dynamical model guidance and the weeks 3-4 outlook. The Great Plains are expected to have a cold first half of November, with a transition to warmer conditions for the second half of the month.

For the 3-month period November-December-January 2019, CPC is forecasting an enhanced chance for above normal temperatures and equal chances for above, near, or below median rainfall across all of eastern OK and northwest AR (outlook issued October 17, 2019). This outlook is based on both statistical and dynamical forecast tools, and decadal timescale climate trends. According to CPC, the combined effect of the ocean-atmosphere system is consistent with ENSO neutral currently. The consensus forecast is for ENSO neutral conditions to be the most likely through the winter and the upcoming spring. With ENSO-neutral favored to persist through the upcoming winter, the odds of other sub-seasonal factors, such as the Arctic Oscillation (AO), will play a larger role in the temperature pattern.

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

A leading band of pre-frontal showers and isolated thunderstorms moved across northeast OK during the morning and early afternoon hours of the 5th, and across northwest AR during the early evening. The cold front then moved into northeast OK, with new convection developing along it by mid-afternoon. These storms remained fairly isolated through mid-evening as the front slowed and stretched from southwest MO to southwest OK. As the low-level jet increased after sunset, scattered showers and thunderstorms increased over northeast OK and northwest AR, north of the front. The front eventually stalled over southeast OK and west central AR, with convection continuing north of it through the night. A band of heavy rain set up from near Claremore, OK to Jay, OK to Springdale, AR during the pre-dawn hours and continued through the late-morning hours of the 6th. Additional thunderstorms developed across east central and southeast OK and into northwest AR during the afternoon. This activity continued until it moved east of the area by late evening. A brief line of elevated showers and thunderstorms affected southeast OK and west central AR for a few hours after midnight on the 7th. A large area of far northeast OK and northwest AR received 5”-8” of rain during this event, with portions of Delaware, Benton, Washington AR, and Carroll Counties receiving 8”-13” of rain (Figs. 4-8). Widespread flash flooding occurred in Benton and Washington Counties in northwest AR, primarily due to the heavy rain on the morning of the 6th. Numerous roads were closed due to high water and several swift water rescues were needed. The NWS COOP observer in Gravette reported Spavinaw Creek was the highest it’s been in many years. The river gage on Osage Creek near Elm Springs stopped reporting after rising over 14’ in about 10 hours, and according to the USGS, the gage house went under water. The Elm Springs rain gage a few miles upstream from this location measured 9.16” in 18 hours, with a storm total of 9.28”. This heavy rain fell over the headwaters of the Illinois River, and resulted in Major flooding along the entire Illinois River upstream of Lake Tenkiller (see preliminary hydrographs at the end of this report; see E3 Report for details). This rain also fell in the Flint Creek basin, with Moderate flooding occurring along Flint Creek near Kansas.

48-hour totals ending 7am 10/07/19 (in inches):

Springdale, AR	12.60	Decatur 2.6 ESE, AR	9.70	Elm Springs, AR	9.28
Maysville 4SE, AR	8.61	Jay 3.3 NNE, OK	8.56	Gravette, OK	8.50
Gentry 7NW, AR	8.19	Jay 4N, OK	7.93	Rogers 2.4 SSW, AR	7.90
Cave Springs 1N, AR	7.66	Pea Ridge, AR	7.18	Lake Eucha, OK	6.97
NW AR Regional Airport	6.93	Sycamore 7SE, OK	6.67	Colcord 4N, OK	6.41
Pensacola Dam, OK	6.39	Siloam Springs Arpt, AR	6.29	Fayetteville 4E, AR	6.26

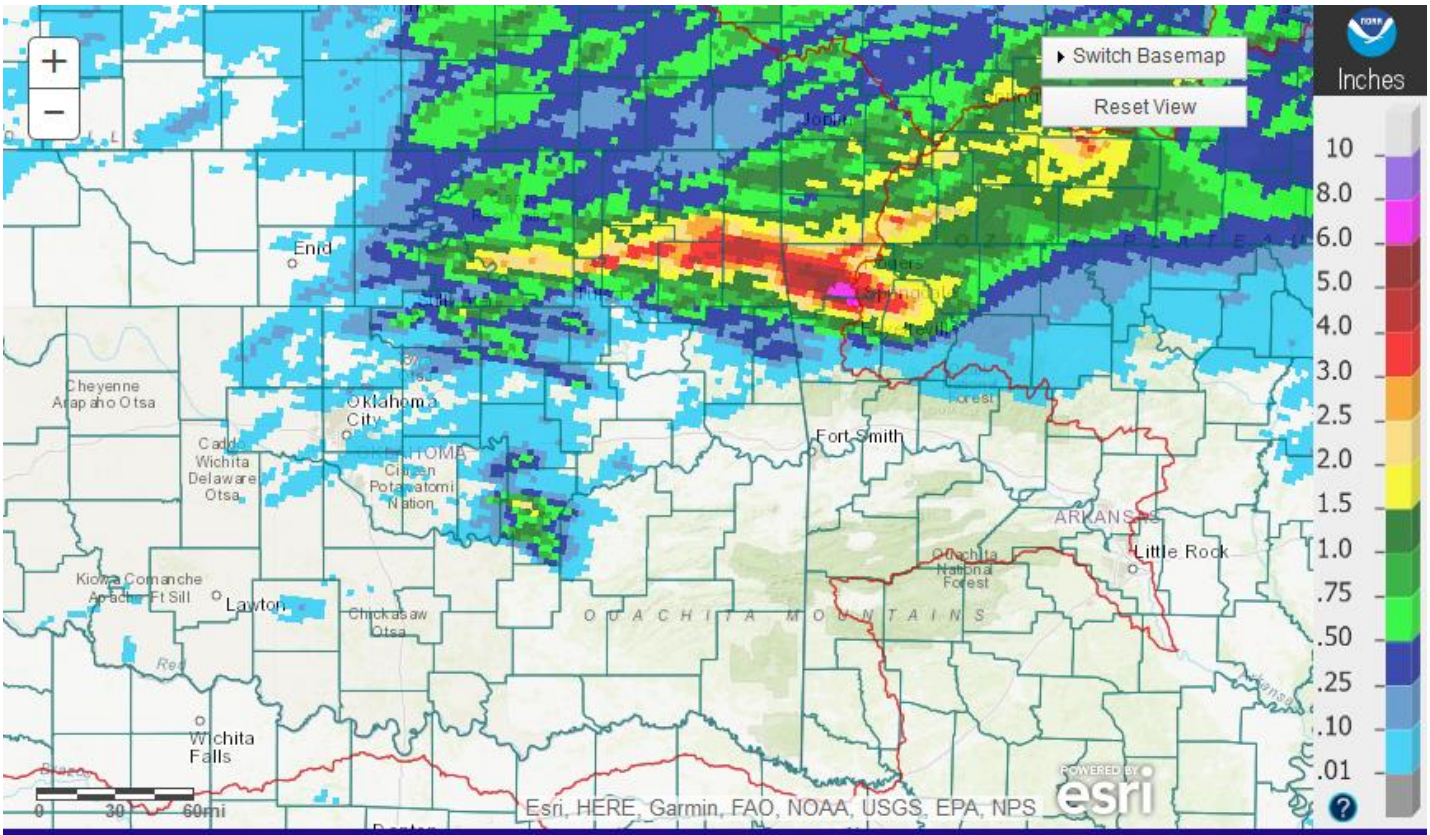


Fig. 4. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/06/2019.

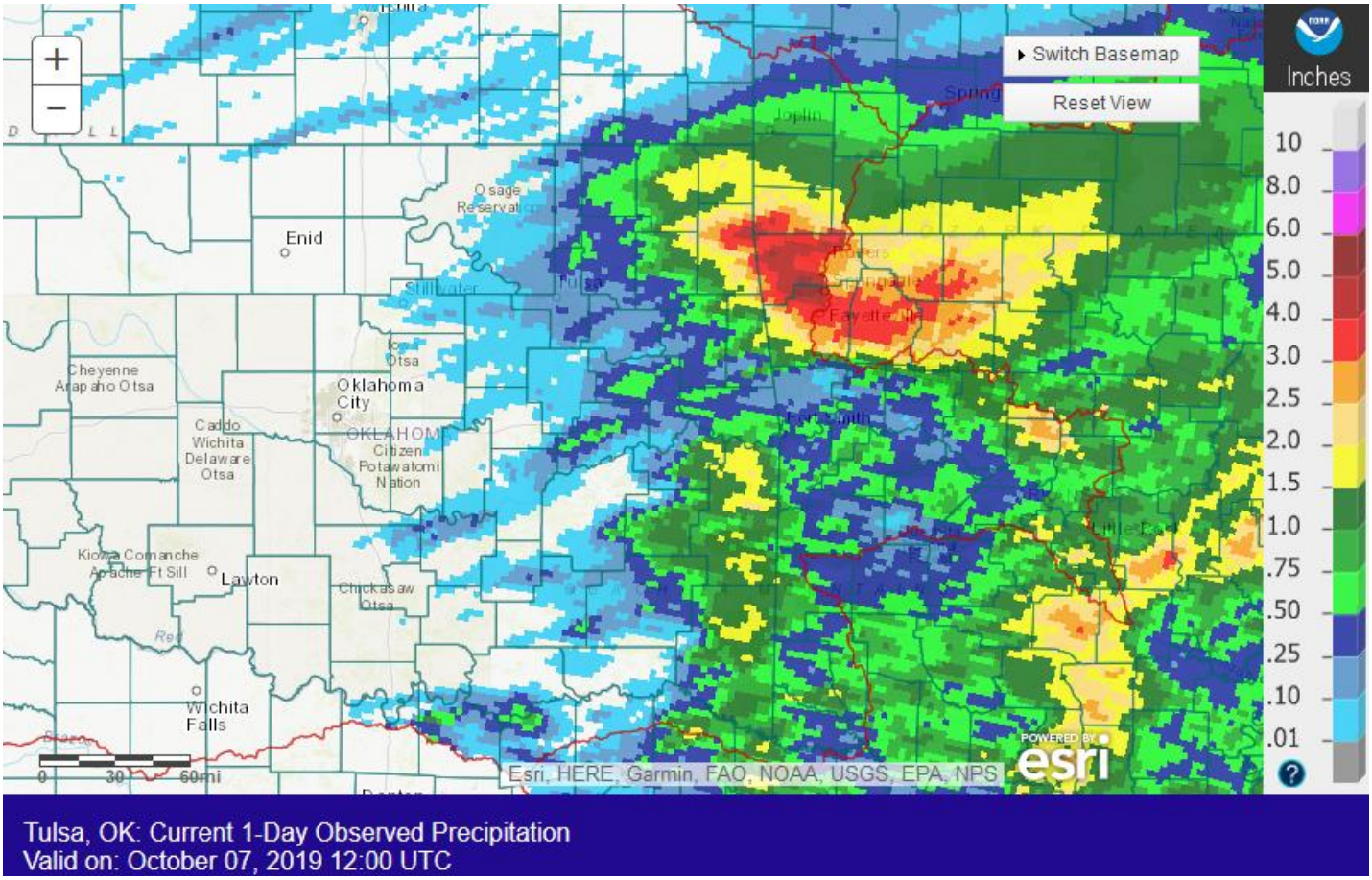


Fig. 5. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/07/2019.

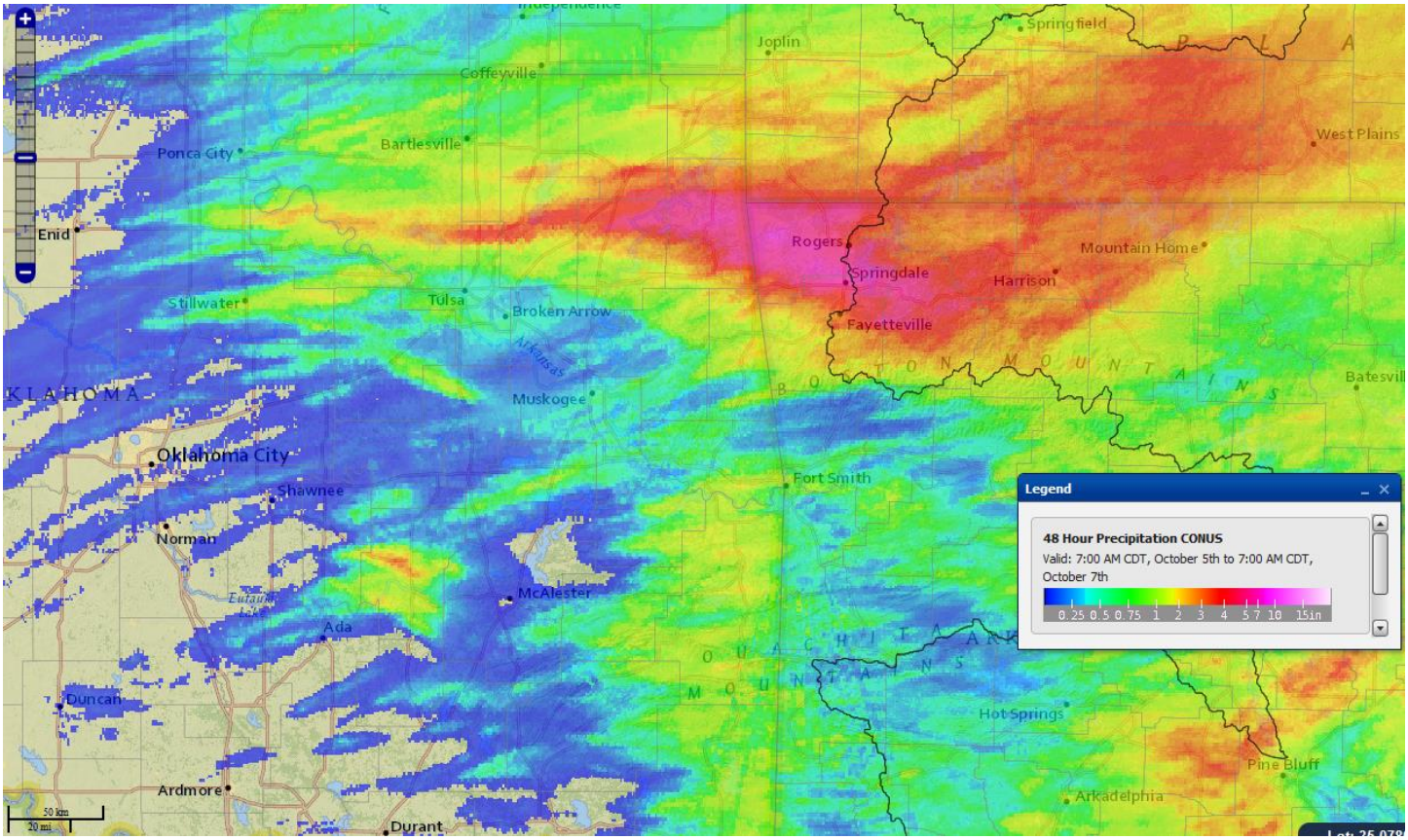


Fig. 6. 48-hour Estimated Observed Rainfall ending at 7am CDT 10/07/2019.

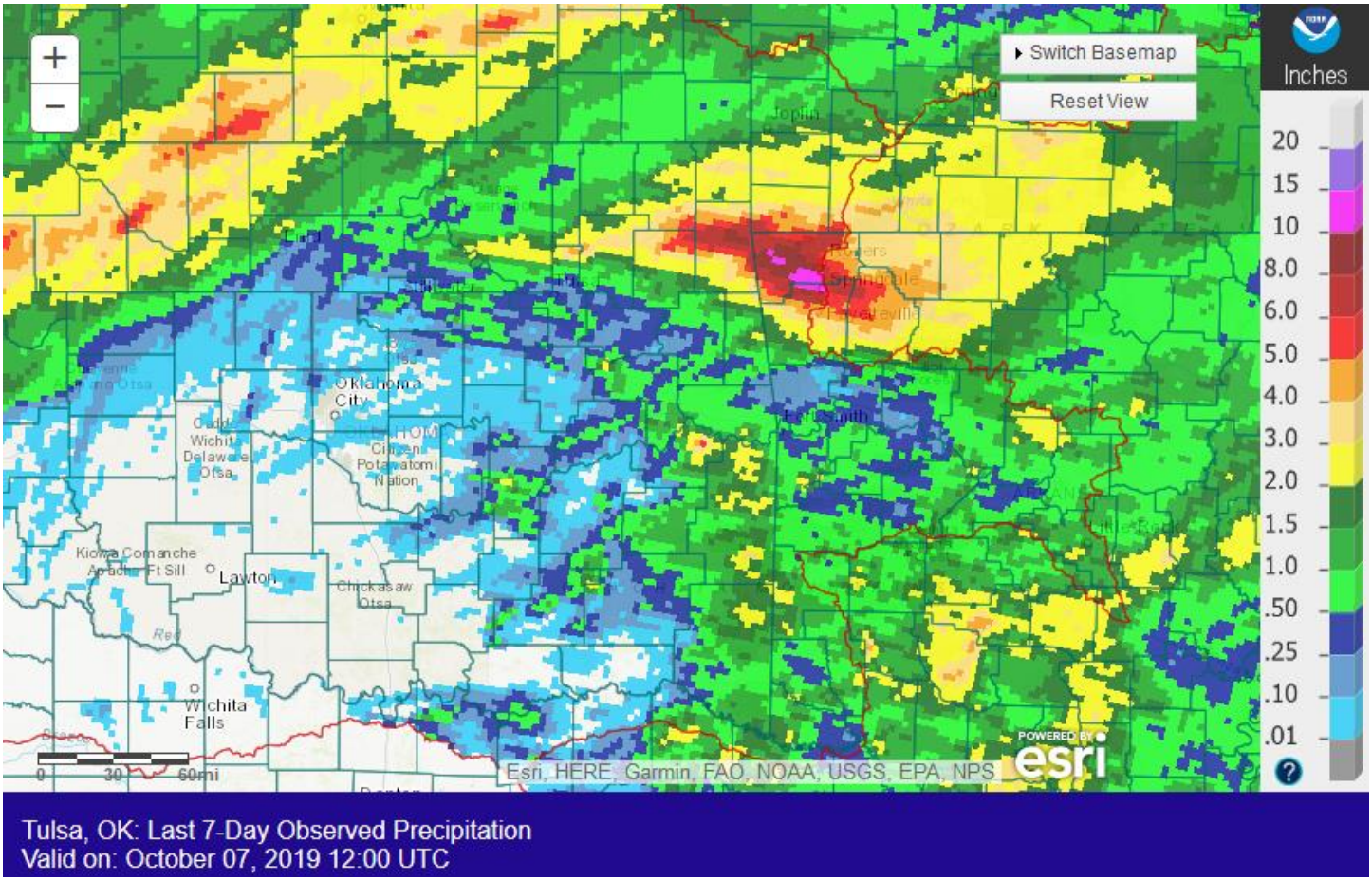


Fig. 7. 48-hour Estimated Observed Rainfall ending at 7am CDT 10/07/2019.

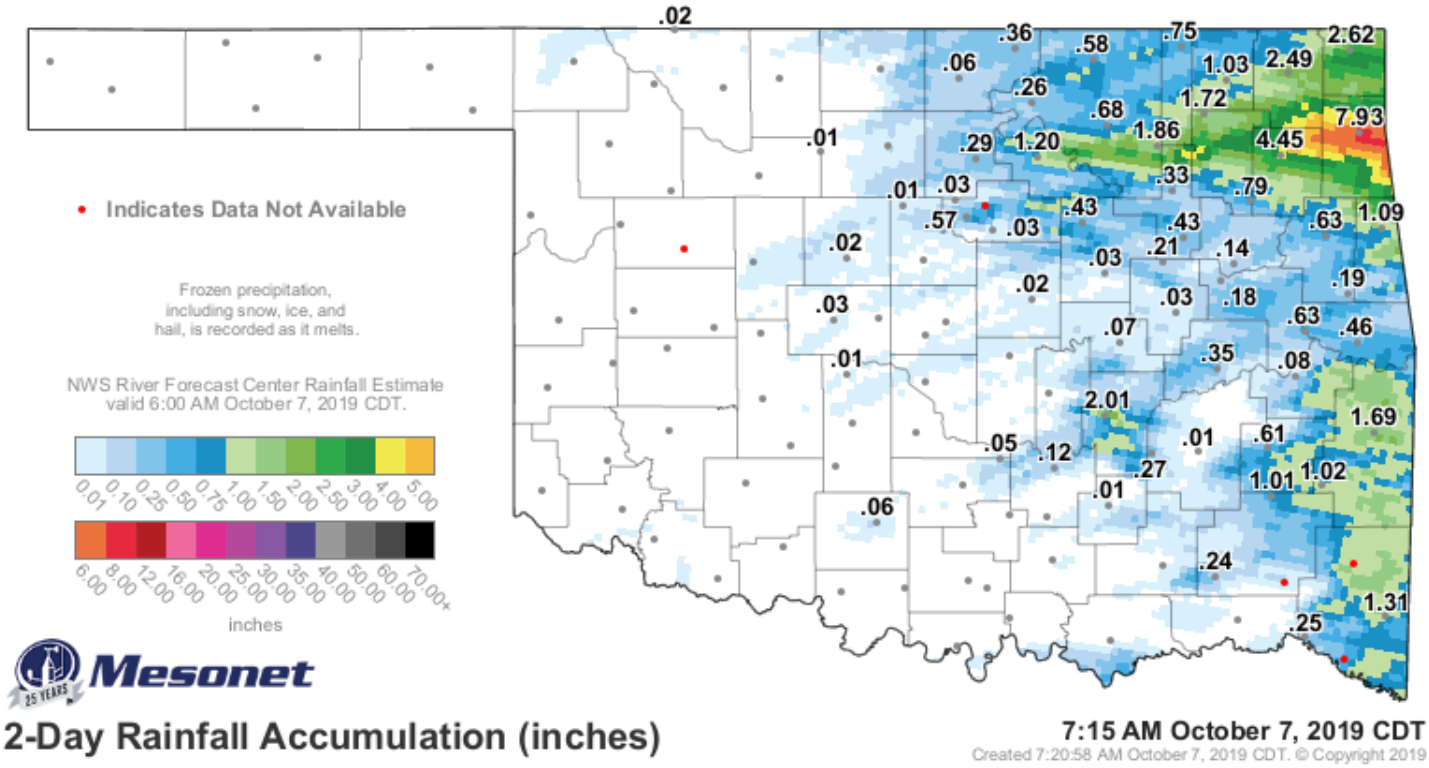


Fig. 8. OK Mesonet (values) and NWS RFC rainfall estimate (image) 48-hour rainfall ending at 7:15 am CDT 10/07/2019.

A strong cold front moved into the region on the 10th. During the morning, scattered showers and thunderstorms affected eastern OK and northwest AR within an area of strong warm air advection ahead of the frontal system. The front then moved into northeast OK by noon, with showers and thunderstorms developing along and ahead of it. Post-frontal storms continued during the evening and overnight hours due to isentropic lift, though the front itself had moved through all of the area by mid-evening. Most of this activity had shifted east of the area by sunrise on the 11th, though some showers lingered until mid-morning in southeast OK and west central AR. A large portion of eastern OK southeast of I-44 and western AR received 1.5”-3” of rain, with pockets of 4”-6” (Figs. 9, 10). This rain fell over the Illinois River basin, which had just had a major flood a few days prior, resulting in another flood of Minor to Moderate severity (see preliminary hydrographs at the end of this report; see E3 Report for details).

24-hour totals ending 7am 10/11/19 (in inches):

Pea Ridge, AR	5.09	Decatur 2.6 ESE, AR	4.33	Stigler 4WNW, OK	4.30
Bella Vista 2E, AR	4.08	Talihina 4SE, OK	3.94	Vian 5.3ENE, OK	3.62

Thunderstorms rapidly developed near a cold front on the evening of the 20th as a potent upper-level trough moved out of the central Rockies and into the Plains. A very moist atmosphere was in place ahead of the front, with precipitable water (PWAT) values of 1.5”-2.0”, along with strong low-level wind shear. Discrete cells were initially able to develop ahead of the front as well, within an area of large-scale ascent from warm advection, before transitioning into a line of thunderstorms by late evening. These thunderstorms were severe, with reports of 70-80 mph winds across northeast OK and northwest AR, and reports of hail of 1.75” (golf ball-sized) to 2.5”(tennis ball-sized) in Creek and Tulsa Counties. Five tornadoes (EF0-EF2) developed on the leading edge of a line of thunderstorms that moved through eastern OK and northwest AR during the late evening hours of the 20th and the early hours of the 21st (see Fig. 11 and https://arcg.is/1X8eW1 for more information on the tornadoes). These tornadoes brought the Oklahoma tornado total to 146 for 2019, setting a new record for most tornadoes in one year for the state. The storms moved quickly east overnight, exiting the area in the pre-dawn hours of the 21st. Rainfall totals were 0.50” - 1.5” for much of eastern OK and northwest AR, though pockets of 1.5” to around 2.5” fell in eastern OK (Fig. 12). Some areas received less than 0.50”.

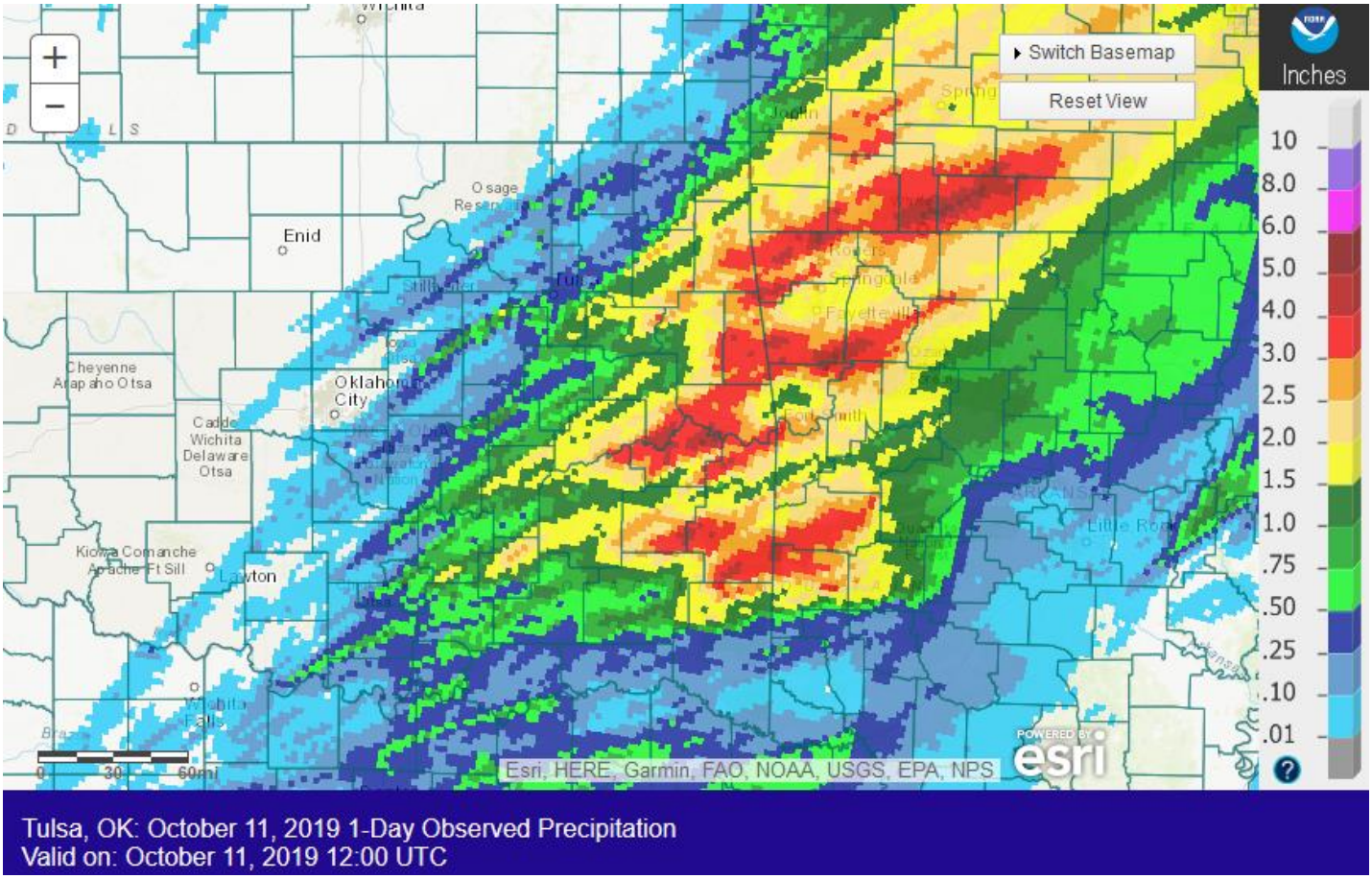


Fig. 9. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/11/2019.

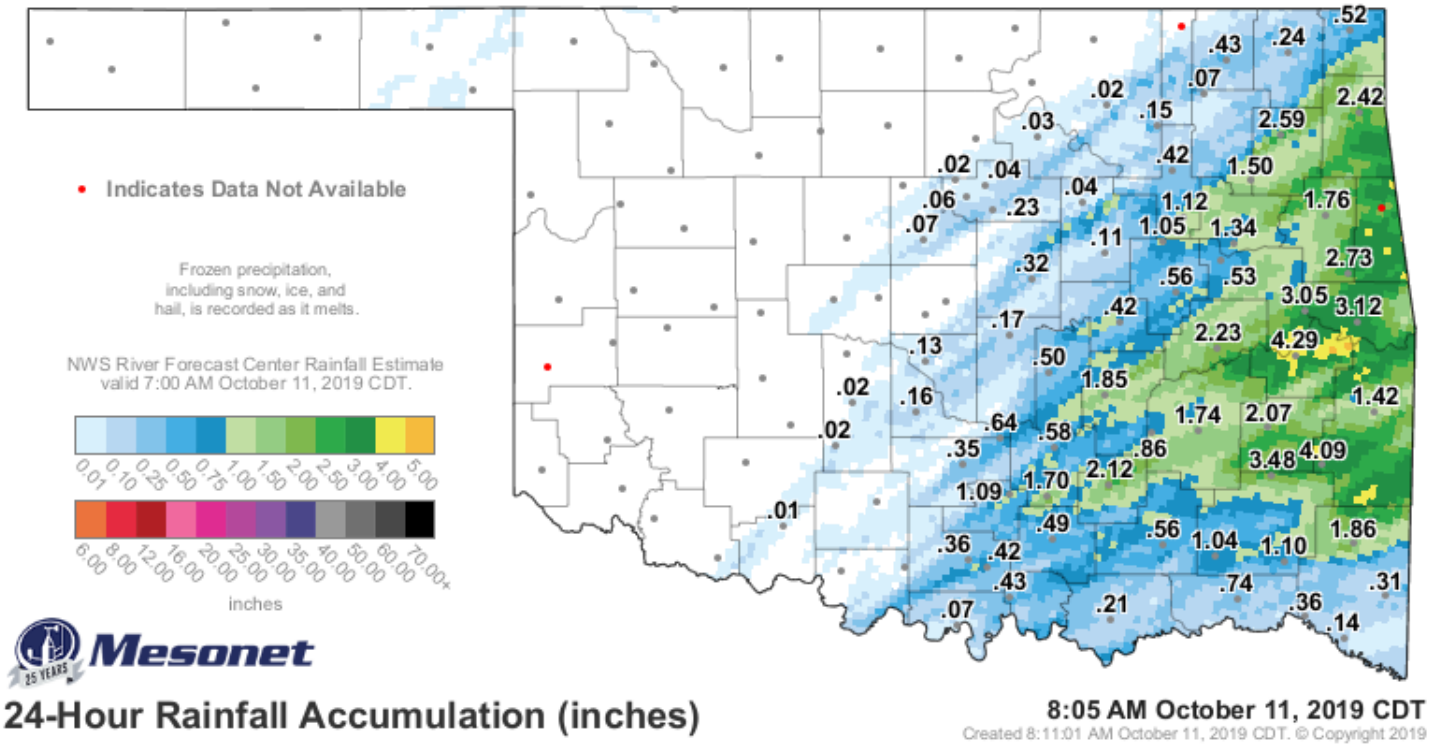


Fig. 10. OK Mesonet (values) and NWS RFC rainfall estimate (image) 24-hour rainfall ending at 8:05 am CDT 10/11/2019.

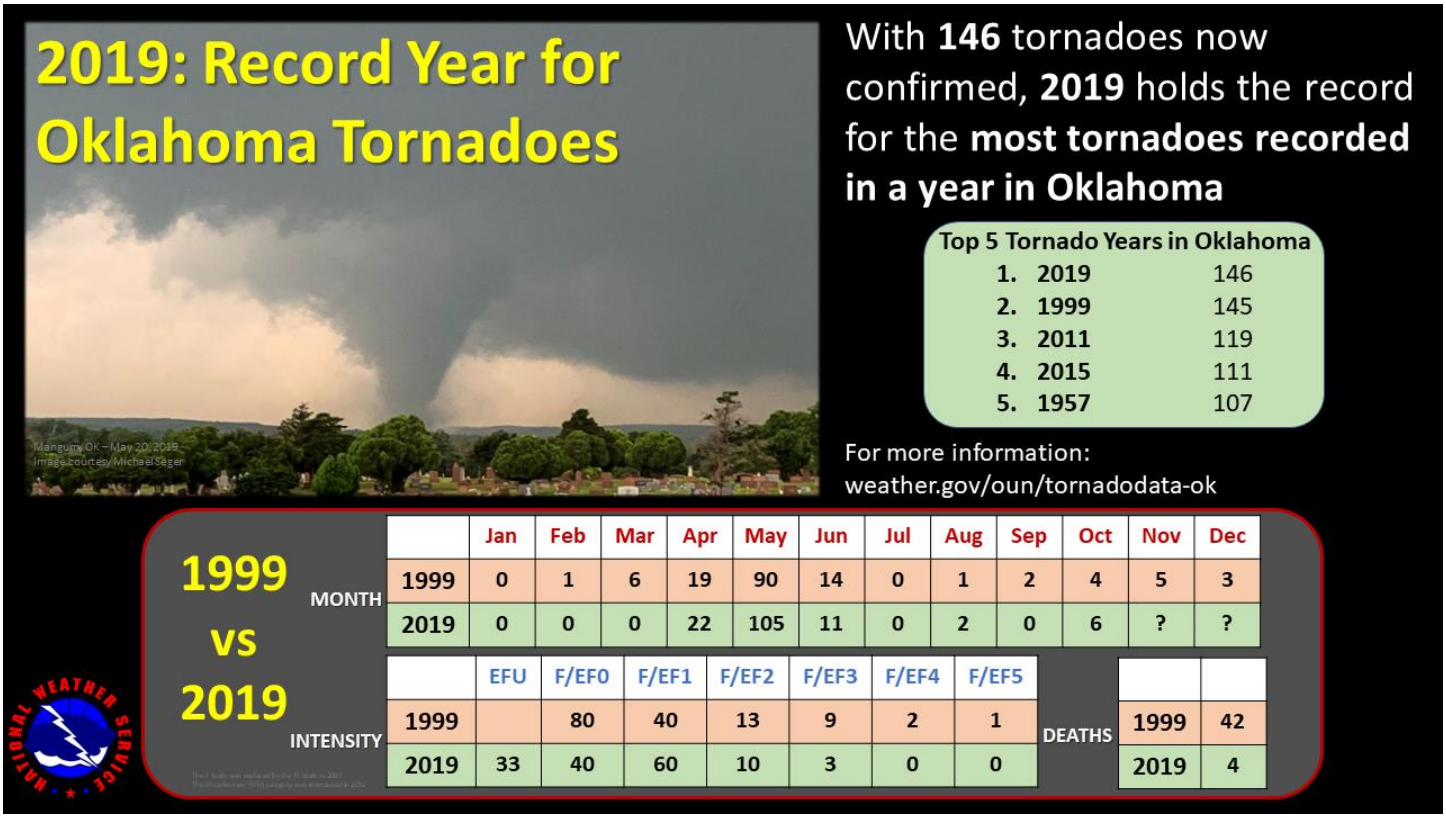


Fig. 11. New tornado record for the State of Oklahoma. Image courtesy of NWS Norman.

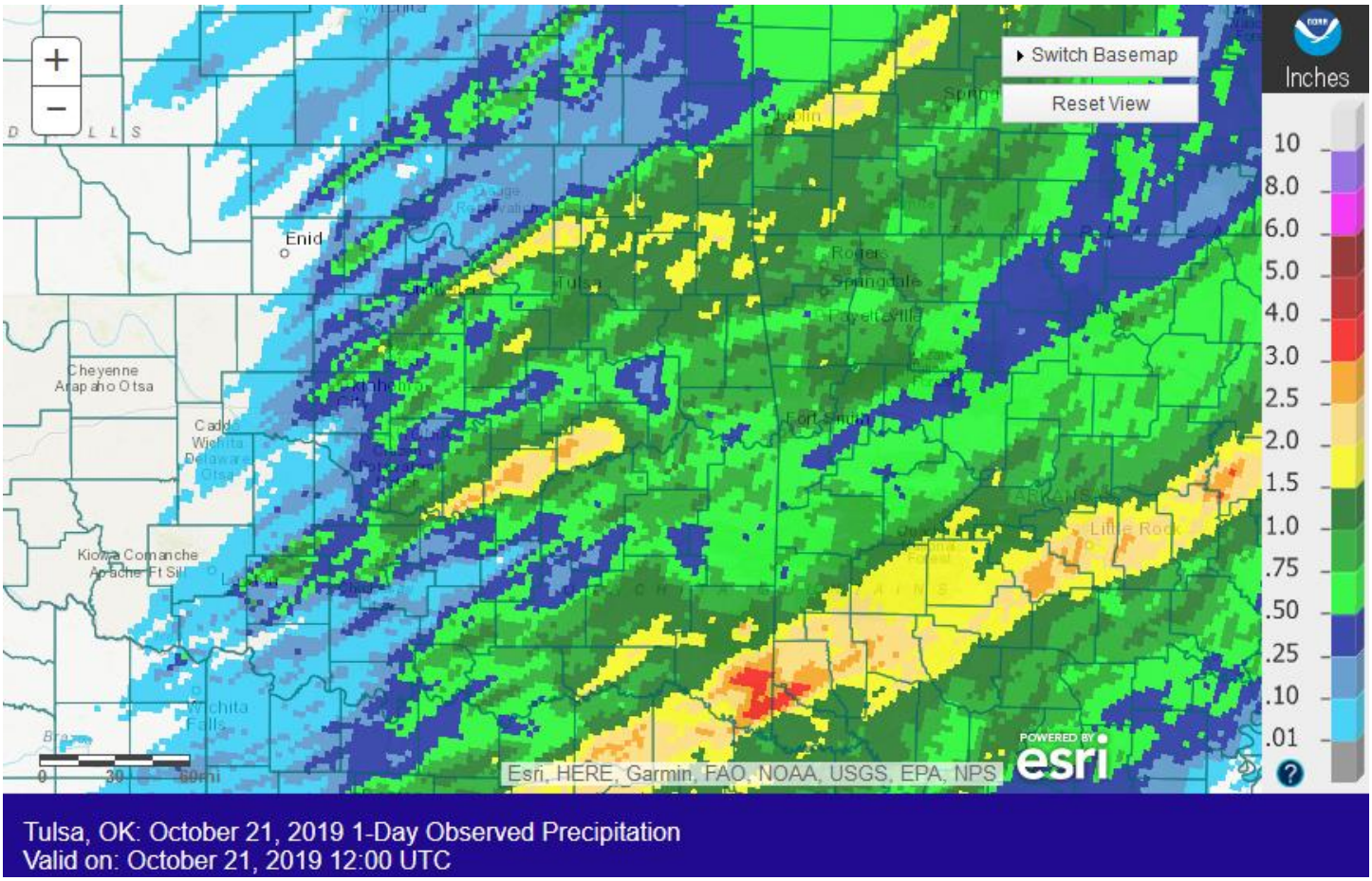


Fig. 12. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/21/2019.

Showers and thunderstorms developed along the I-44 corridor during the evening of the 23rd, increasing in coverage through the overnight hours, as a cold front moved through the region. Most of the rain was post-frontal, in an area of enhanced isentropic lift. By 7 am on the 24th, the cold front stretched from southeast OK into west central AR, and most of northeast OK south of I-44, east central OK, and northwest AR had received 0.75" to 3" of rain (Fig 13). The front brought much colder temperatures, with a 24-hour temperature change of 20°-25°F at mid-morning on the 24th (Fig. 14). Widespread showers with embedded thunderstorms then continued for much of the day on the 24th as the zone of isentropic lift and high PWAT persisted across the region. Though some locations received breaks in the rain, overall, the rain continued across eastern OK and western AR through the night and into the morning of the 25th. By 7 am on the 25th, 0.75"-4" of rain had fallen, with the highest totals of 2.5"-4" occurring along a band from McAlester to Ozark (Fig. 15). The calendar day total rainfall for McAlester, OK was 6.25" on the 24th, setting a new daily record (and this is the 3rd highest daily rainfall on record in October). A closed low then tracked along the Red River on the 25th, with wrap-around precipitation falling over eastern OK and northwest AR through the day. While much of the rain decreased from morning through the afternoon, coverage began to increase again during the evening hours as the upper-level storm system approached. Periods of heavy rain occurred during the overnight and early morning hours, primarily over east central OK. This rain brought another widespread 0.50"-2.5" of rain to eastern OK south of I-44 and far west central AR by 7 am on the 26th (Fig. 16). The rain finally moved east of the area by early afternoon on the 26th as the upper-level system departed the area. East central OK and northwest AR received another 0.50" to around 1.5" before the rain ended (Fig. 17). The heavy rain from the 23rd through 26th resulted in Minor flooding along the Illinois River, with several crests along the lower portion of the river near Tahlequah (see preliminary hydrographs at the end of this report; see E3 Report for details). Rises also occurred along the lower Arkansas River and the lower Poteau River, but the rivers did not reach flood stage.

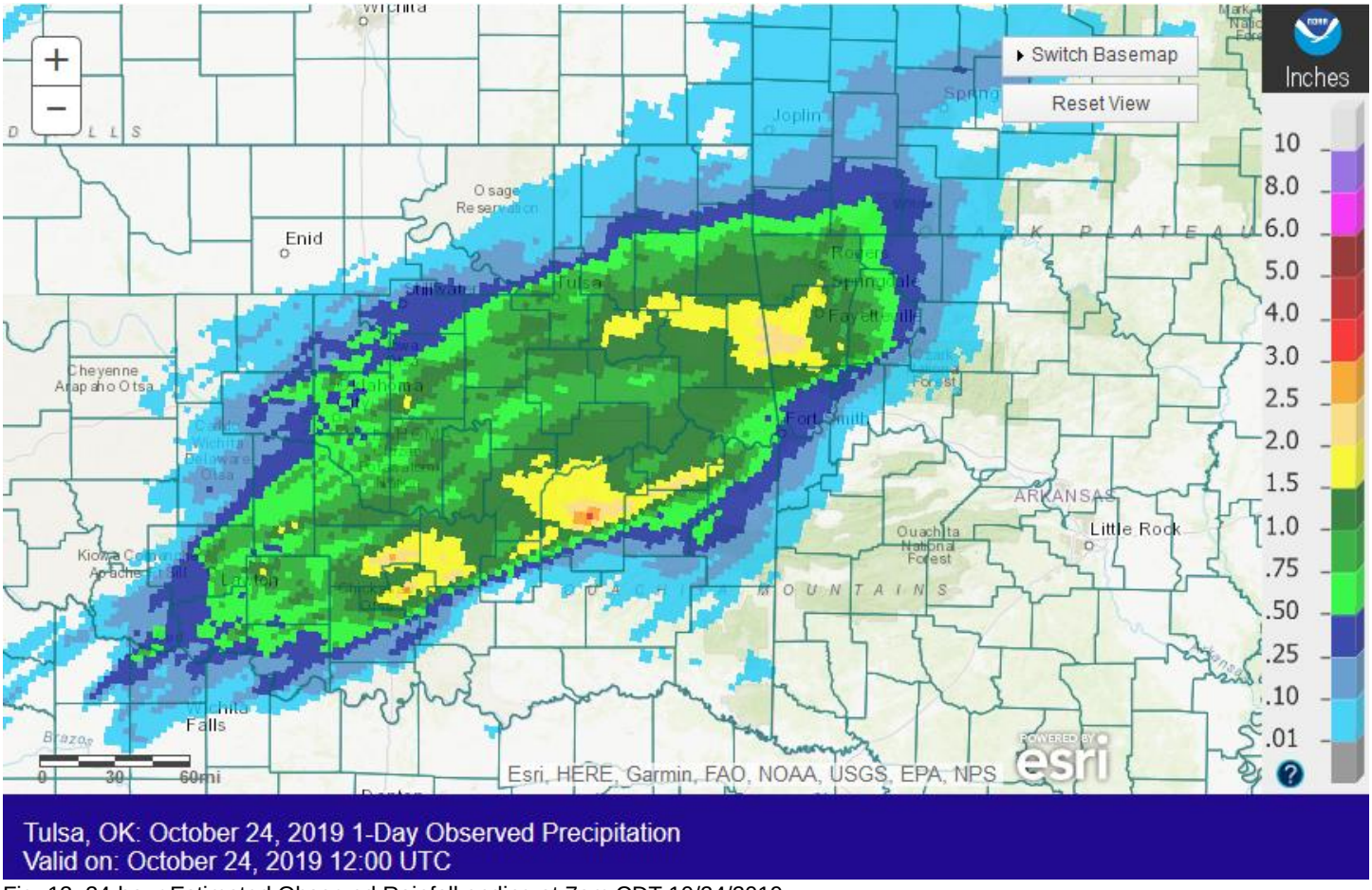


Fig. 13. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/24/2019.

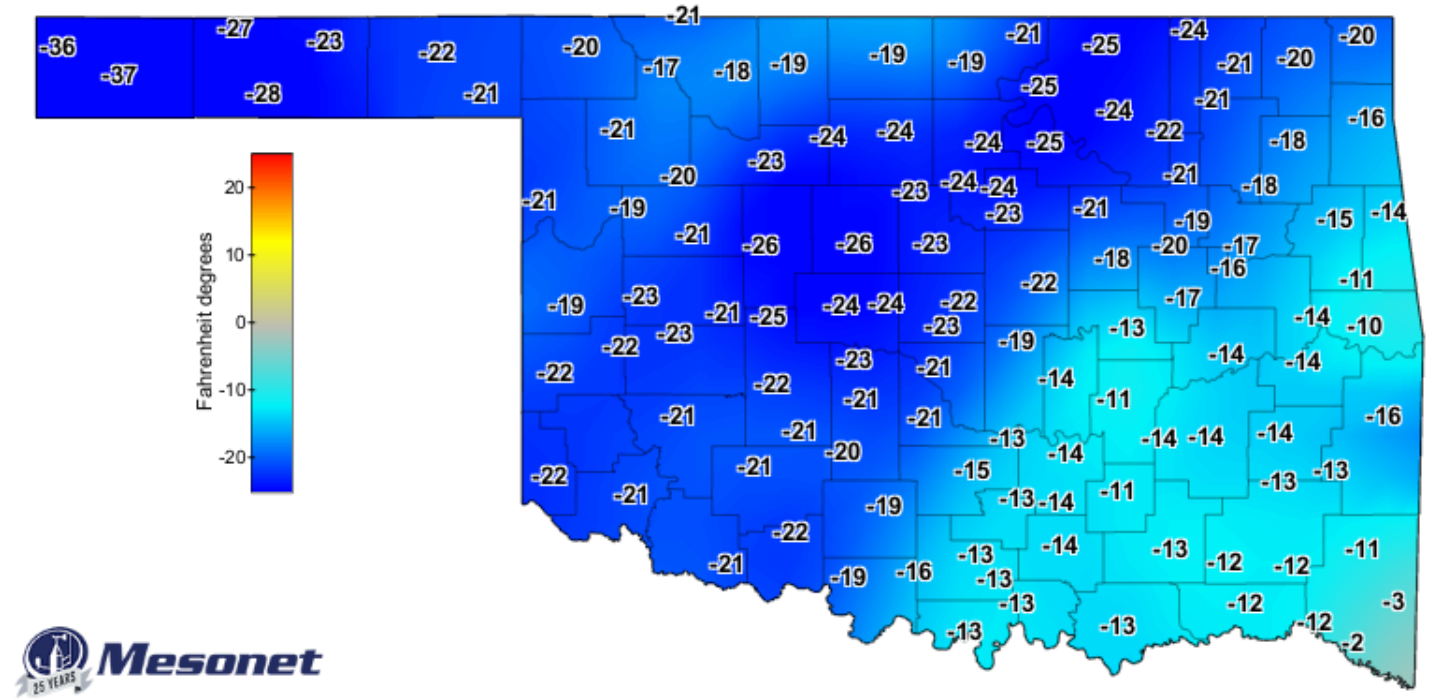


Fig. 14. OK Mesonet 24-hour temperature change at 11:10 am CDT 10/24/2019.

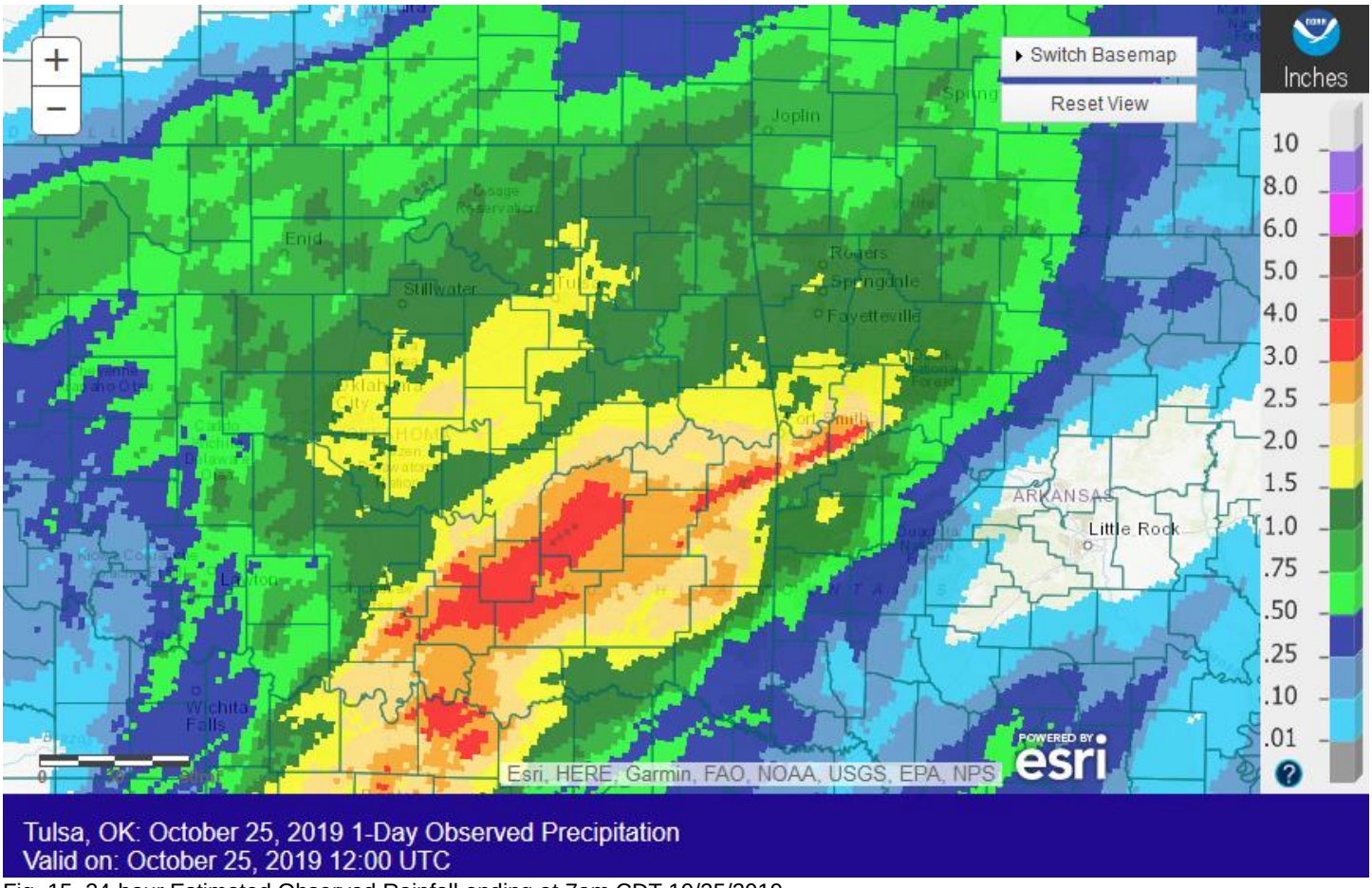


Fig. 15. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/25/2019.

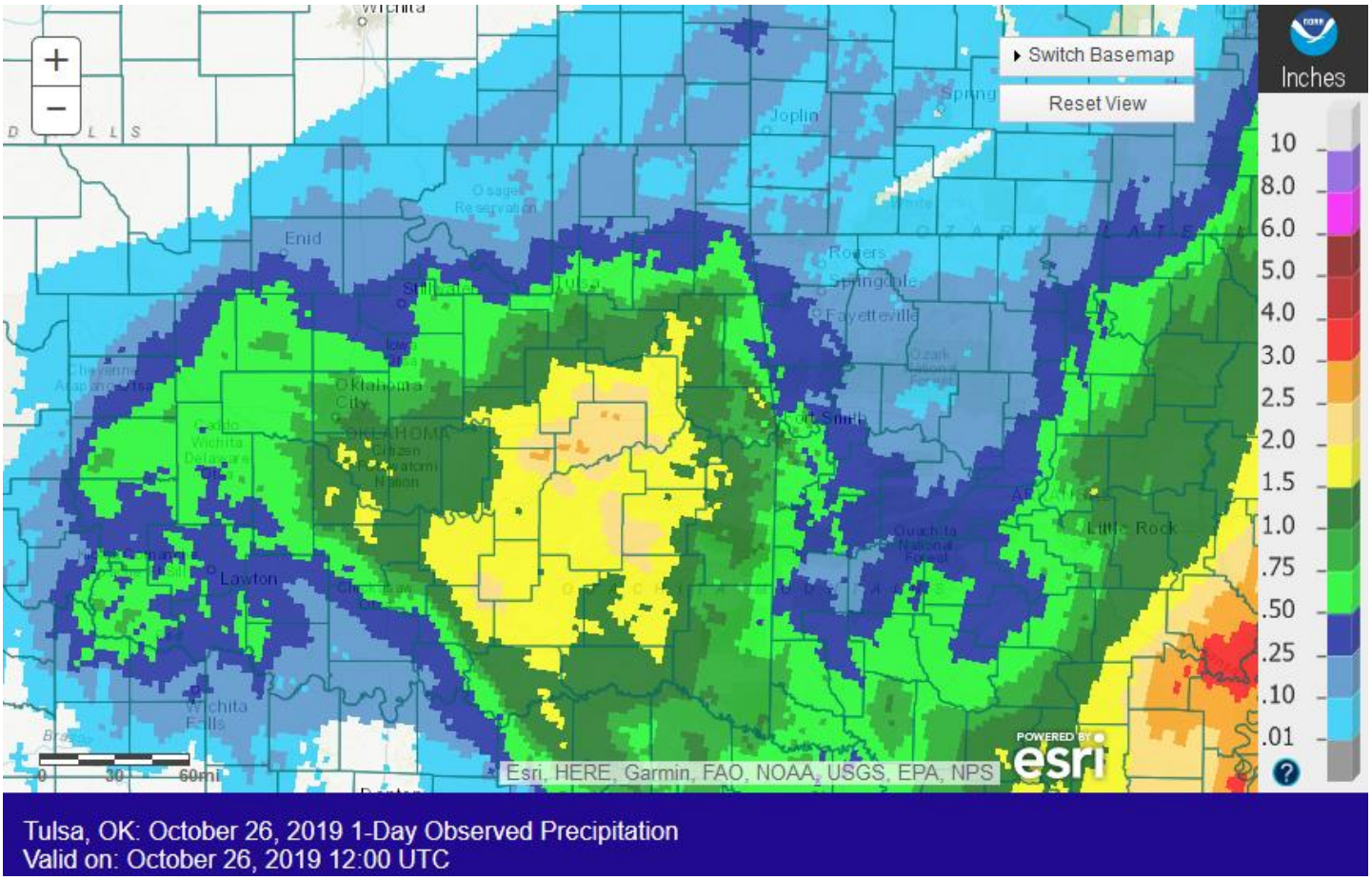


Fig. 16. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/26/2019.

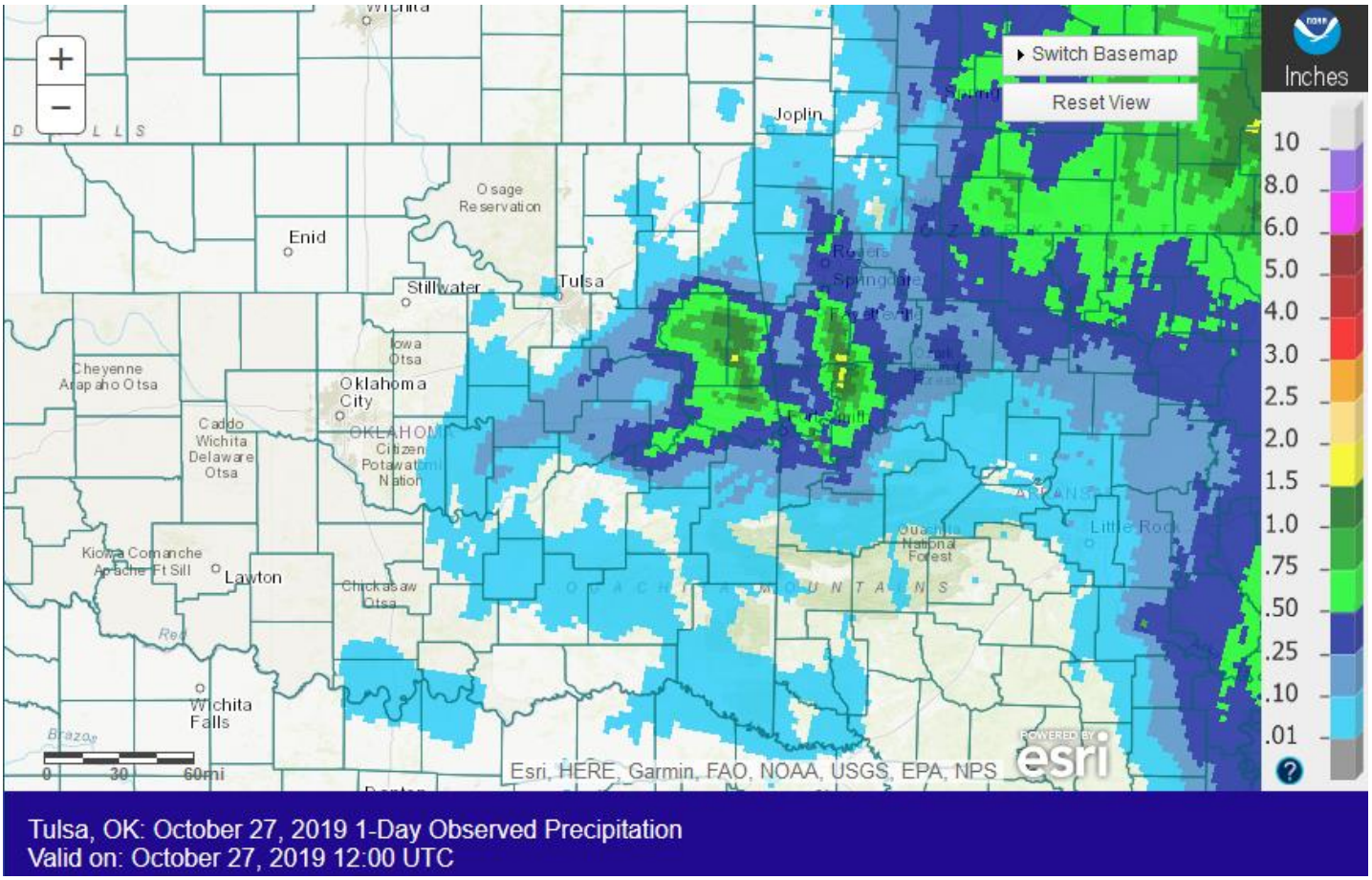


Fig. 17. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/27/2019.

A front lifted slightly north into southeast OK and northwest AR on the 29th. Moisture overriding the boundary combined with a strong upper-level trough, resulting in increasing coverage of showers and isolated thunderstorms across eastern OK and western AR from late morning through afternoon. Widespread precipitation then continued for much of the overnight hours. Most of the rain had ended by mid-morning on the 30th, though scattered showers and thunderstorms remained over southeast OK and west central AR through noon. Rainfall totals were 0.50" to around 1.5" for nearly all of eastern OK and western AR (Fig. 18). This rain once again caused a rise along the Illinois River, but the river remained in its banks (see preliminary hydrographs at the end of this report). Drizzle lingered behind the departing storm system, and as colder air moved in from the north, there were snow flurries across northeast OK and northwest AR. Little to no accumulation occurred, but even so, snow is rare in October. Measurable snow has only been recorded once in October in Tulsa and in Fayetteville, and a trace of snow has been recorded only four other times in Tulsa and five other times in Fayetteville.

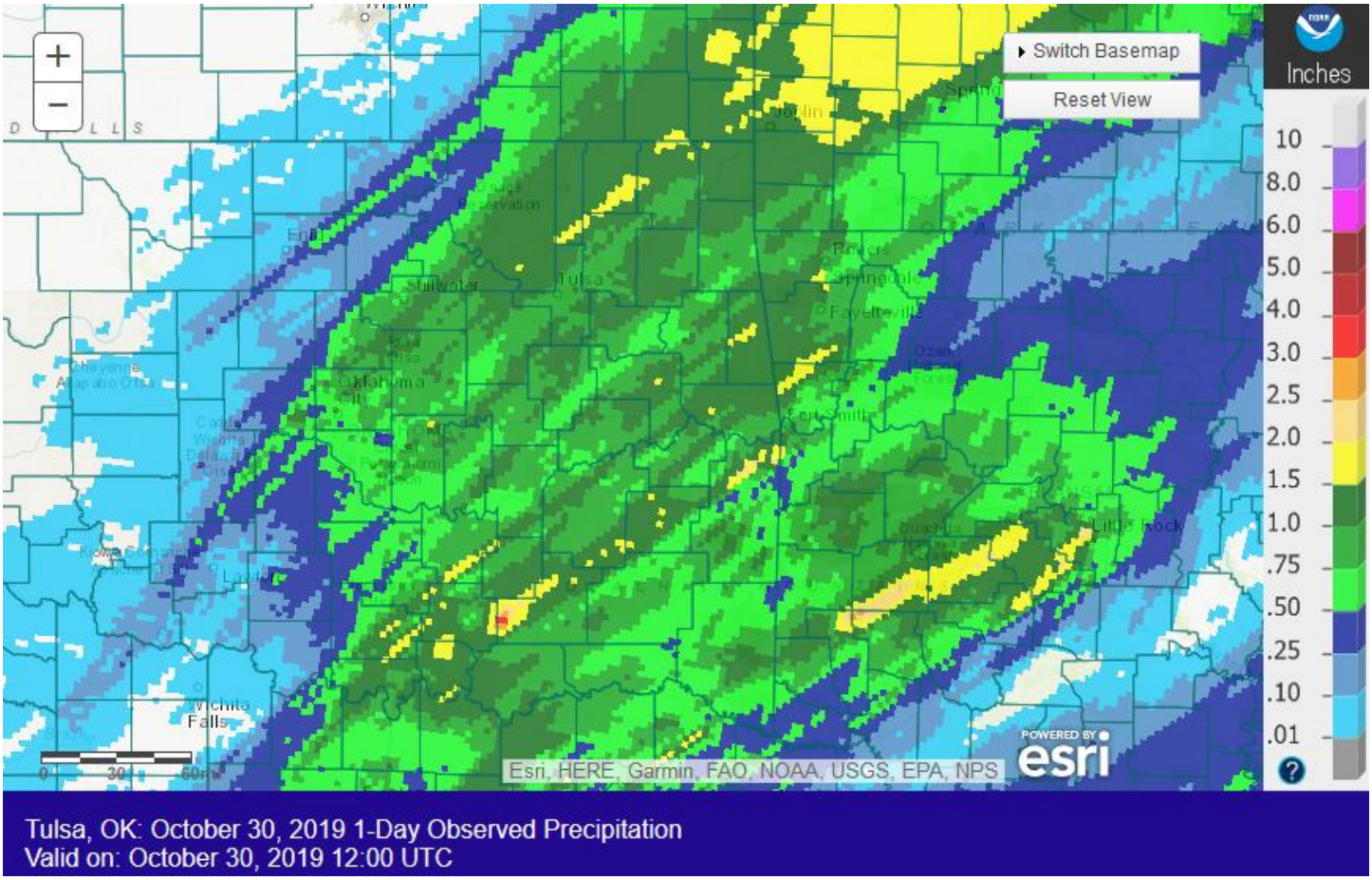


Fig. 18. 24-hour Estimated Observed Rainfall ending at 7am CDT 10/30/2019.

Written by:

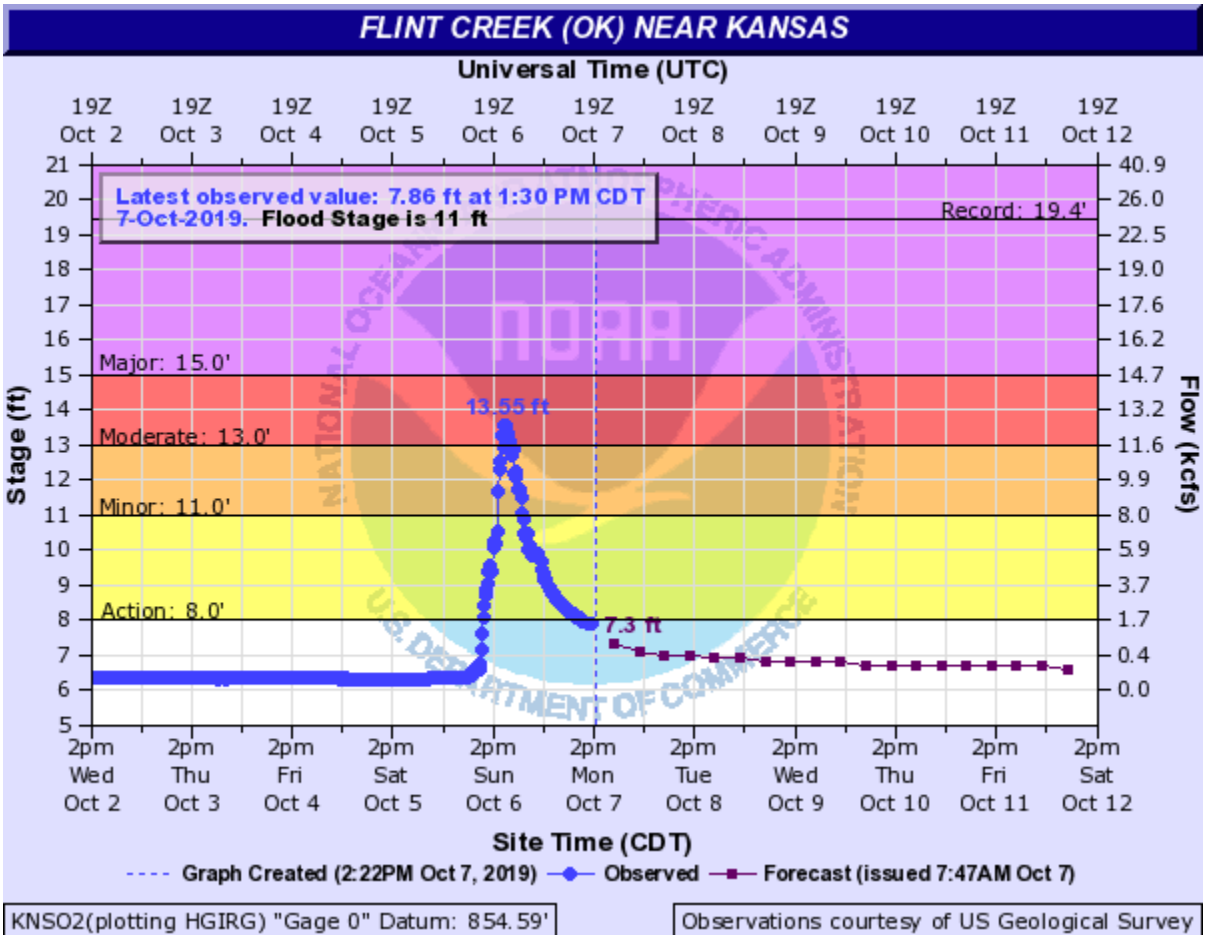
Nicole McGavock
Service Hydrologist
WFO Tulsa

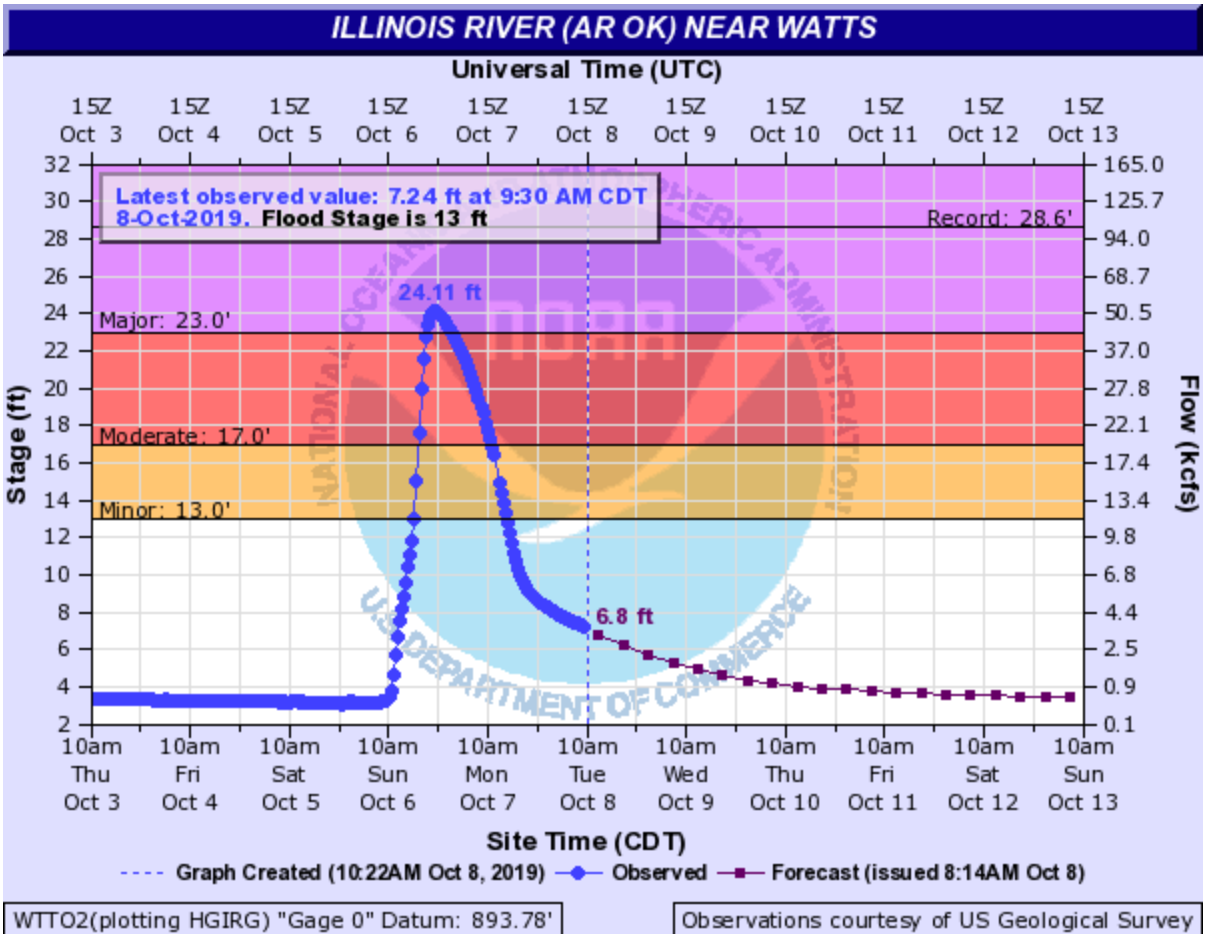
Products issued in October 2019:

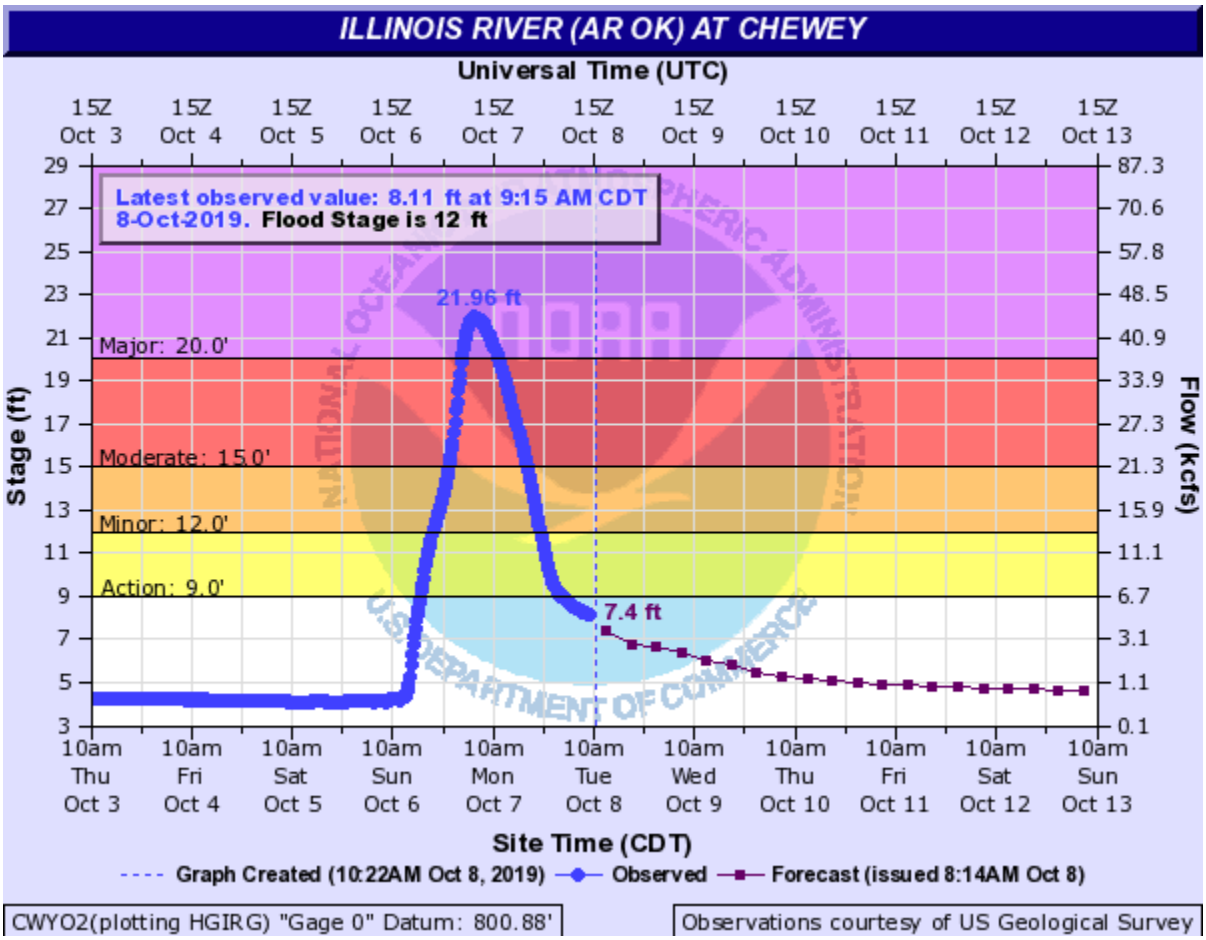
*CWYO2 became a daily river forecast point September 7, 2016
*MLBA4 and OZGA4 transferred to NWS Tulsa HSA February 5, 2014
*Mixed case River Flood products began July 31, 2013

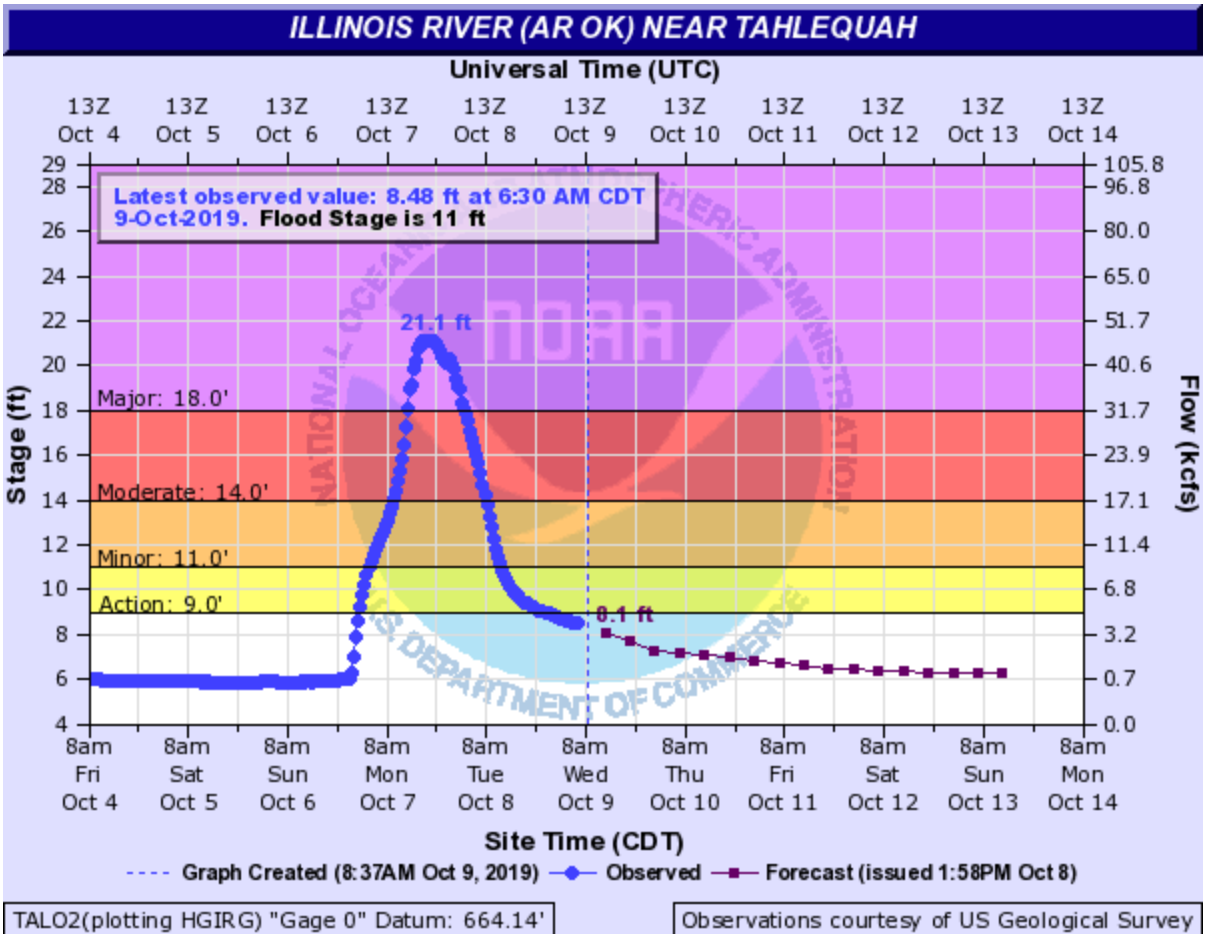
7 Flash Flood Warnings (FFW)
7 Flash Flood Statements (FFS)
2 Flash/Areal Flood Watches (FFA) (3 Watch FFA CON/EXT/EXA/EXB/CAN)
10 Urban and Small Stream Advisories (FLS)
7 Areal Flood Warnings (FLW)
1 Areal Flood Statements (FLS)
16 River Flood Warnings (FLW) (includes category increases)
72 River Flood Statements (FLS)
10 River Flood Advisories (FLS) (38 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)

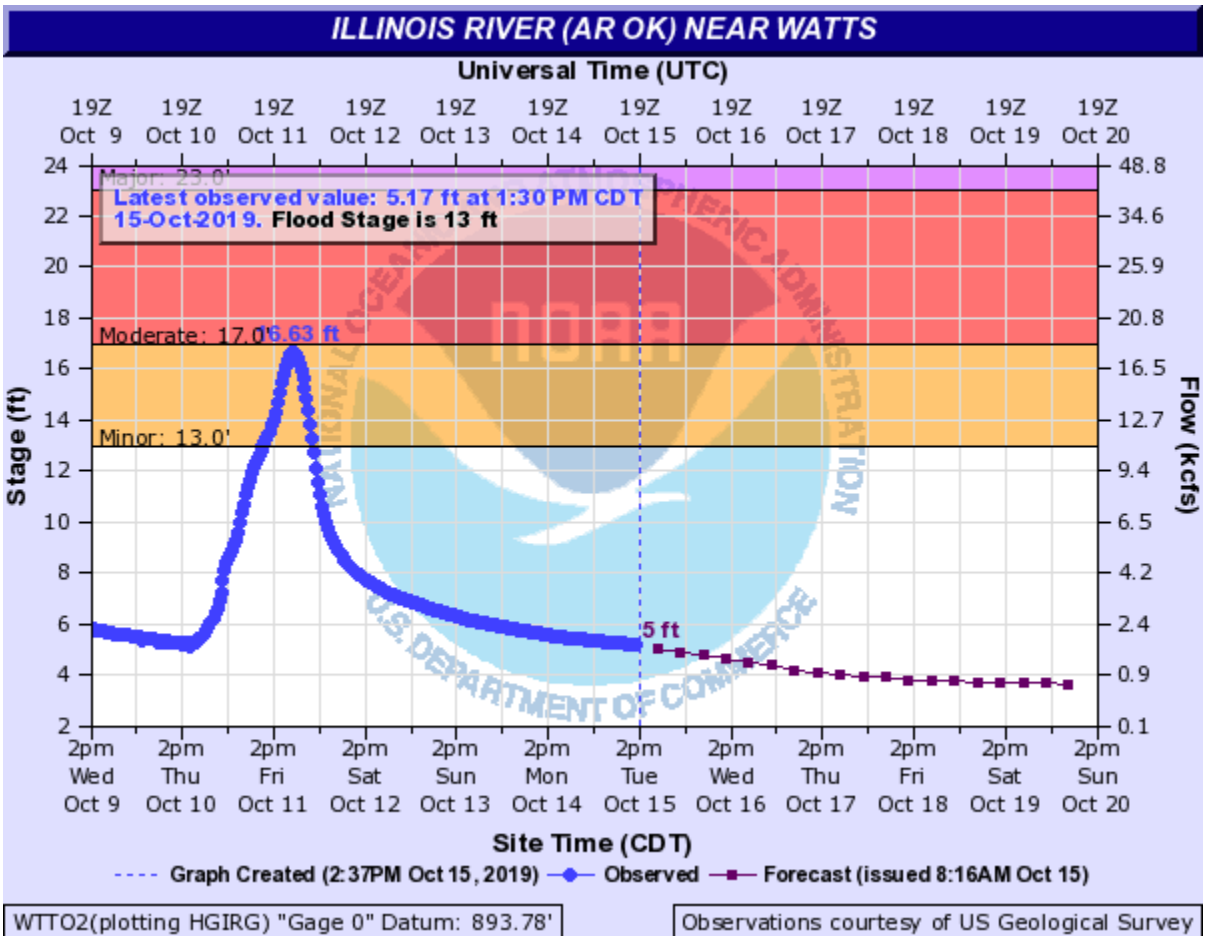
Preliminary Hydrographs:

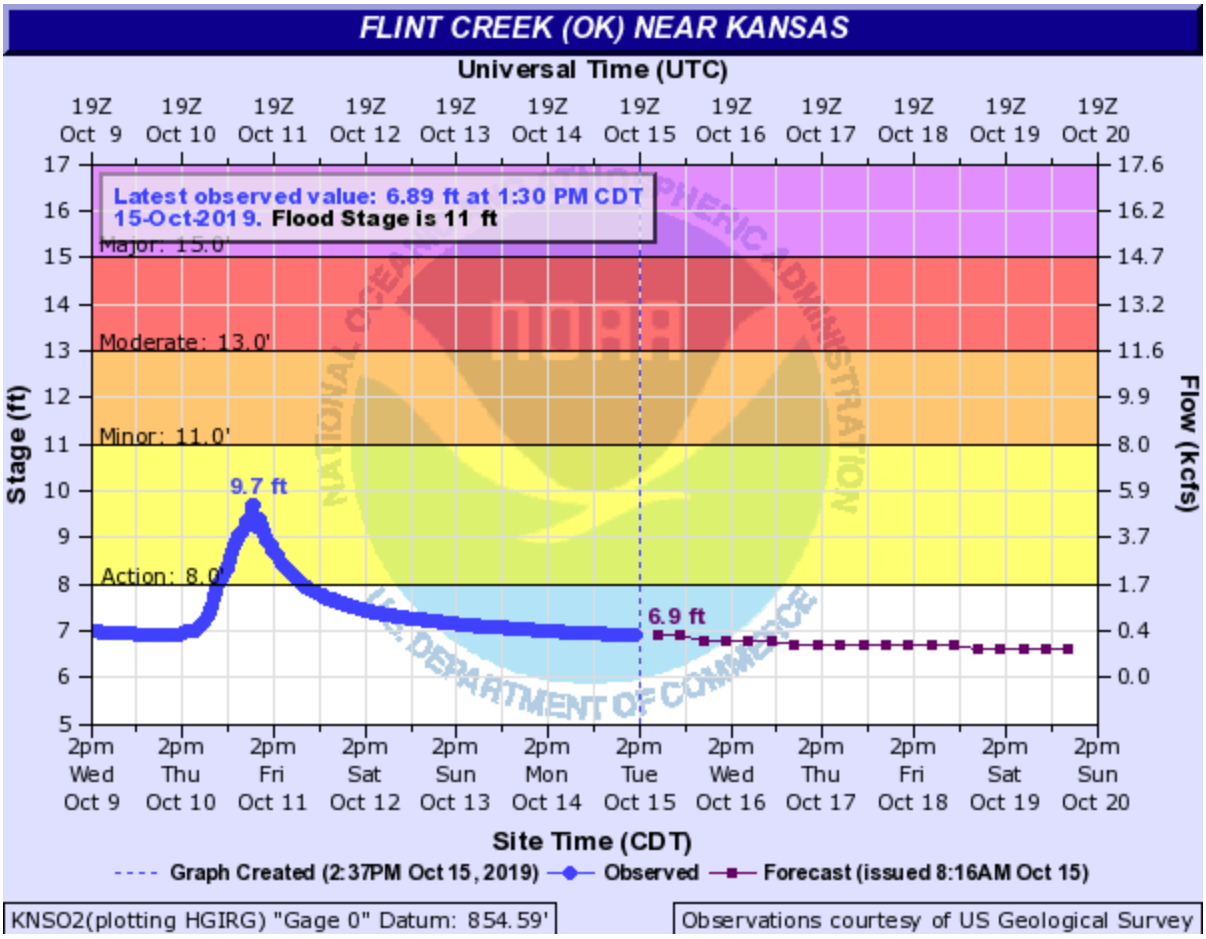


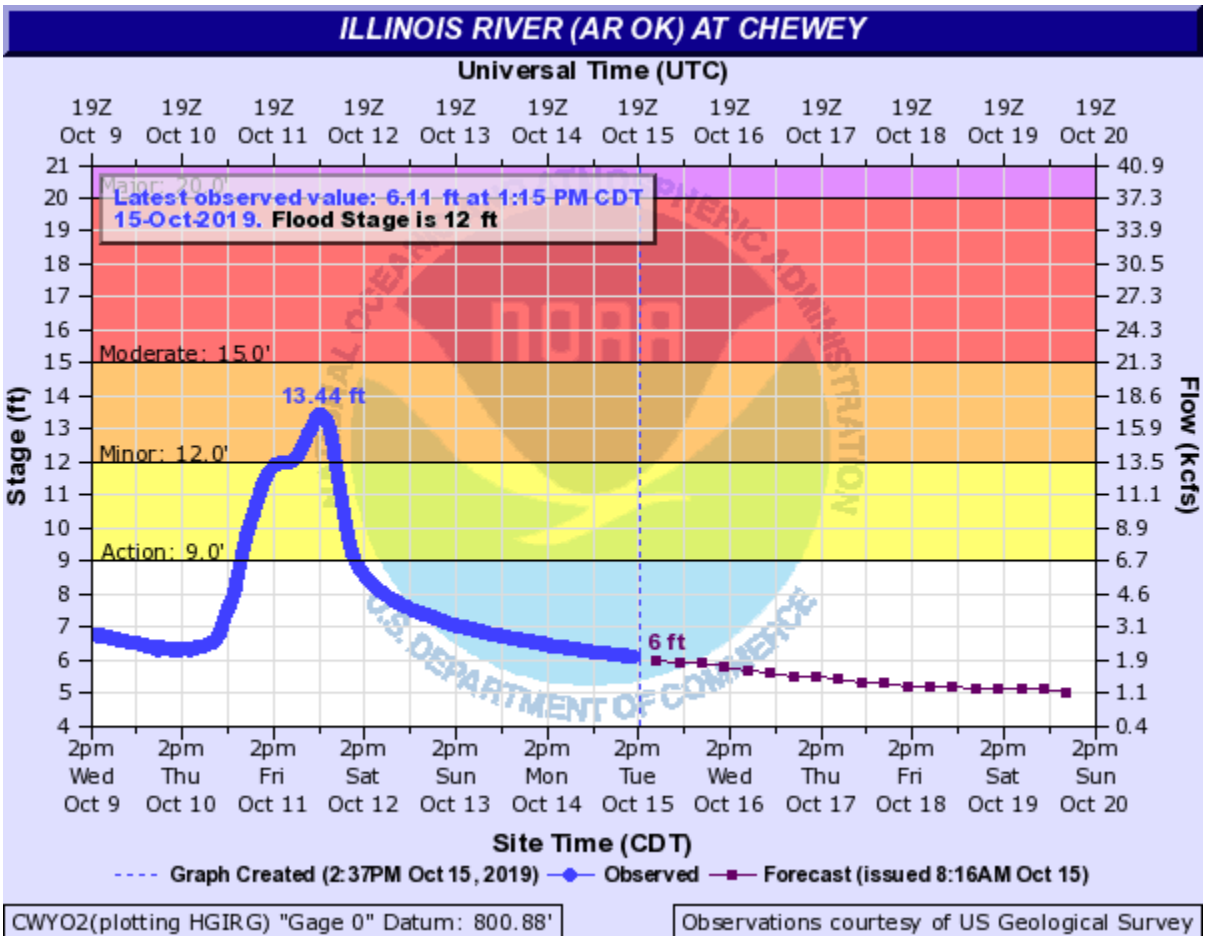

ILLINOIS RIVER (AR OK) NEAR WATTS
Universal Time (UTC)
15Z Oct 3
15Z Oct 4
15Z Oct 5
15Z Oct 6
15Z Oct 7
15Z Oct 8
15Z Oct 9
15Z Oct 10
15Z Oct 11
15Z Oct 12
15Z Oct 13
Latest observed value: 7.24 ft at 9:30 AM CDT 8-Oct-2019. Flood Stage is 13 ft
Record: 28.6'
24.11 ft
Major: 23.0'
Moderate: 17.0'
Minor: 13.0'
6.8 ft
Stage (ft)
Flow (kcfs)
32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2
165.0 125.7 94.0 68.7 50.5 37.0 27.8 22.1 17.4 13.4 9.8 6.8 4.4 2.5 0.9 0.1
10am Thu Oct 3
10am Fri Oct 4
10am Sat Oct 5
10am Sun Oct 6
10am Mon Oct 7
10am Tue Oct 8
10am Wed Oct 9
10am Thu Oct 10
10am Fri Oct 11
10am Sat Oct 12
10am Sun Oct 13
Site Time (CDT)
Graph Created (10:22AM Oct 8, 2019)
Observed
Forecast (issued 8:14AM Oct 8)
WTTO2(plotting HGIRG) "Gage 0" Datum: 893.78'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) AT CHEWEY
Universal Time (UTC)
15Z Oct 3
15Z Oct 4
15Z Oct 5
15Z Oct 6
15Z Oct 7
15Z Oct 8
15Z Oct 9
15Z Oct 10
15Z Oct 11
15Z Oct 12
15Z Oct 13
Latest observed value: 8.11 ft at 9:15 AM CDT 8-Oct-2019. Flood Stage is 12 ft
21.96 ft
Major: 20.0'
Moderate: 15.0'
Minor: 12.0'
Action: 9.0'
7.4 ft
Stage (ft)
Flow (kcfs)
29 27 25 23 21 19 17 15 13 11 9 7 5 3
87.3 70.6 57.8 48.5 40.9 33.9 27.3 21.3 15.9 11.1 6.7 3.1 1.1 0.1
10am Thu Oct 3
10am Fri Oct 4
10am Sat Oct 5
10am Sun Oct 6
10am Mon Oct 7
10am Tue Oct 8
10am Wed Oct 9
10am Thu Oct 10
10am Fri Oct 11
10am Sat Oct 12
10am Sun Oct 13
Site Time (CDT)
Graph Created (10:22AM Oct 8, 2019)
Observed
Forecast (issued 8:14AM Oct 8)
CWYO2(plotting HGIRG) "Gage 0" Datum: 800.88'
Observations courtesy of US Geological Survey

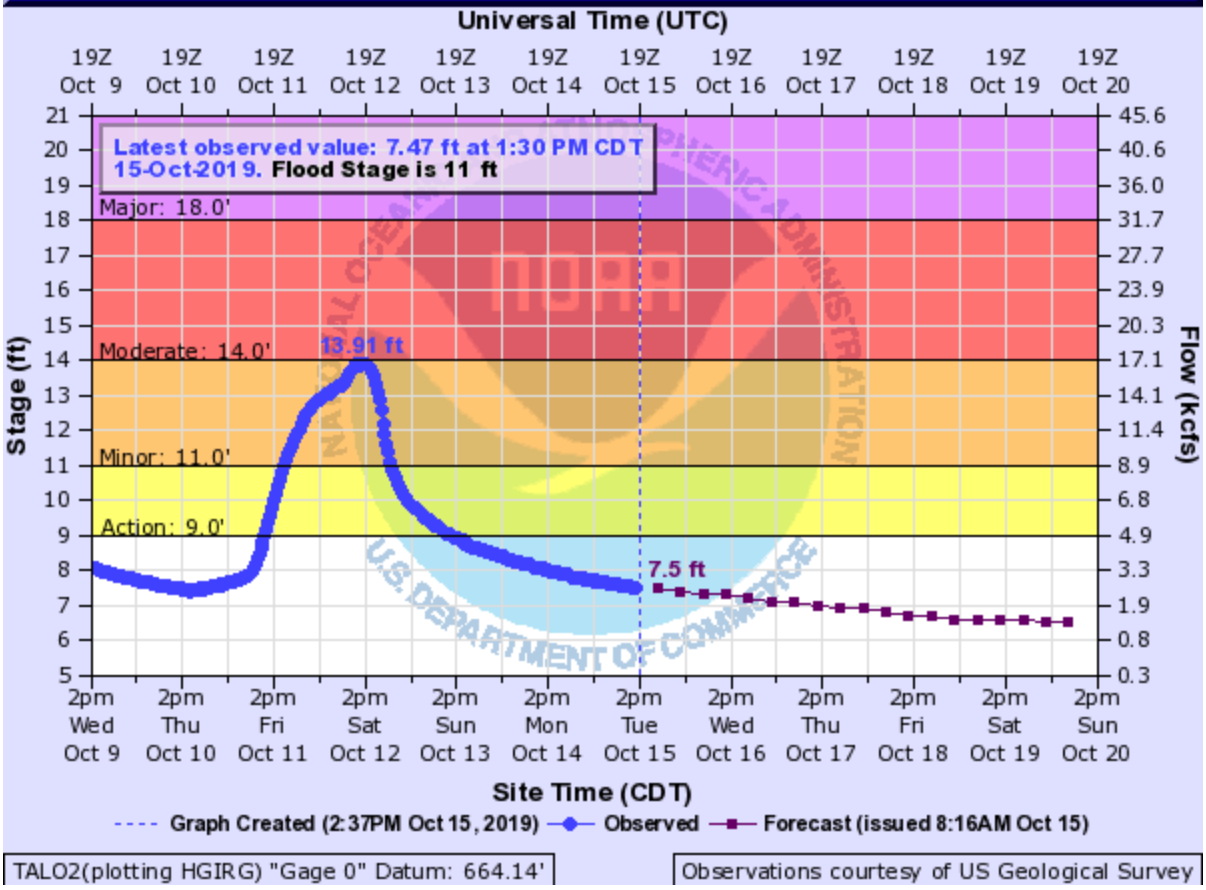

ILLINOIS RIVER (AR OK) NEAR TAHLEQUAH
Universal Time (UTC)
13Z Oct 4
13Z Oct 5
13Z Oct 6
13Z Oct 7
13Z Oct 8
13Z Oct 9
13Z Oct 10
13Z Oct 11
13Z Oct 12
13Z Oct 13
13Z Oct 14
Latest observed value: 8.48 ft at 6:30 AM CDT 9-Oct-2019. Flood Stage is 11 ft
21.1 ft
8.1 ft
Major: 18.0'
Moderate: 14.0'
Minor: 11.0'
Action: 9.0'
Stage (ft)
Flow (kcfs)
29
28
26
24
22
20
18
16
14
12
10
8
6
4
105.8
96.8
80.0
65.0
51.7
40.6
31.7
23.9
17.1
11.4
6.8
3.2
0.7
0.0
8am Fri Oct 4
8am Sat Oct 5
8am Sun Oct 6
8am Mon Oct 7
8am Tue Oct 8
8am Wed Oct 9
8am Thu Oct 10
8am Fri Oct 11
8am Sat Oct 12
8am Sun Oct 13
8am Mon Oct 14
Site Time (CDT)
Graph Created (8:37AM Oct 9, 2019)
Observed
Forecast (issued 1:58PM Oct 8)
TALO2(plotting HGIRG) "Gage 0" Datum: 664.14'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) NEAR WATTS
Universal Time (UTC)
19Z Oct 9
19Z Oct 10
19Z Oct 11
19Z Oct 12
19Z Oct 13
19Z Oct 14
19Z Oct 15
19Z Oct 16
19Z Oct 17
19Z Oct 18
19Z Oct 19
19Z Oct 20
Latest observed value: 5.17 ft at 1:30 PM CDT 15-Oct-2019. Flood Stage is 13 ft
16.63 ft
5 ft
Major: 23.0'
Moderate: 17.0'
Minor: 13.0'
Stage (ft)
Flow (kcfs)
24
22
20
18
16
14
12
10
8
6
4
2
48.8
34.6
25.9
20.8
16.5
12.7
9.4
6.5
4.2
2.4
0.9
0.1
2pm Wed Oct 9
2pm Thu Oct 10
2pm Fri Oct 11
2pm Sat Oct 12
2pm Sun Oct 13
2pm Mon Oct 14
2pm Tue Oct 15
2pm Wed Oct 16
2pm Thu Oct 17
2pm Fri Oct 18
2pm Sat Oct 19
2pm Sun Oct 20
Site Time (CDT)
Graph Created (2:37PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
WTTO2(plotting HGIRG) "Gage 0" Datum: 893.78'
Observations courtesy of US Geological Survey


FLINT CREEK (OK) NEAR KANSAS
Universal Time (UTC)
19Z Oct 9
19Z Oct 10
19Z Oct 11
19Z Oct 12
19Z Oct 13
19Z Oct 14
19Z Oct 15
19Z Oct 16
19Z Oct 17
19Z Oct 18
19Z Oct 19
19Z Oct 20
Latest observed value: 6.89 ft at 1:30 PM CDT 15-Oct-2019. Flood Stage is 11 ft
Major: 15.0'
Moderate: 13.0'
Minor: 11.0'
Action: 8.0'
9.7 ft
6.9 ft
Stage (ft)
Flow (kcfs)
17
16
15
14
13
12
11
10
9
8
7
6
5
17.6
16.2
14.7
13.2
11.6
9.9
8.0
5.9
3.7
1.7
0.4
0.0
2pm Wed Oct 9
2pm Thu Oct 10
2pm Fri Oct 11
2pm Sat Oct 12
2pm Sun Oct 13
2pm Mon Oct 14
2pm Tue Oct 15
2pm Wed Oct 16
2pm Thu Oct 17
2pm Fri Oct 18
2pm Sat Oct 19
2pm Sun Oct 20
Site Time (CDT)
Graph Created (2:37PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
KNSO2(plotting HGIRG) "Gage 0" Datum: 854.59'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) AT CHEWEY
Universal Time (UTC)
19Z Oct 9
19Z Oct 10
19Z Oct 11
19Z Oct 12
19Z Oct 13
19Z Oct 14
19Z Oct 15
19Z Oct 16
19Z Oct 17
19Z Oct 18
19Z Oct 19
19Z Oct 20
Latest observed value: 6.11 ft at 1:15 PM CDT 15-Oct-2019. Flood Stage is 12 ft
Major: 20.0'
Moderate: 15.0'
Minor: 12.0'
Action: 9.0'
13.44 ft
6 ft
Stage (ft)
Flow (kcfs)
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
40.9
37.3
33.9
30.5
27.3
24.3
21.3
18.6
15.9
13.5
11.1
8.9
6.7
4.6
3.1
1.9
1.1
0.4
2pm Wed Oct 9
2pm Thu Oct 10
2pm Fri Oct 11
2pm Sat Oct 12
2pm Sun Oct 13
2pm Mon Oct 14
2pm Tue Oct 15
2pm Wed Oct 16
2pm Thu Oct 17
2pm Fri Oct 18
2pm Sat Oct 19
2pm Sun Oct 20
Site Time (CDT)
Graph Created (2:37PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
CWYO2(plotting HGIRG) "Gage 0" Datum: 800.88'
Observations courtesy of US Geological Survey

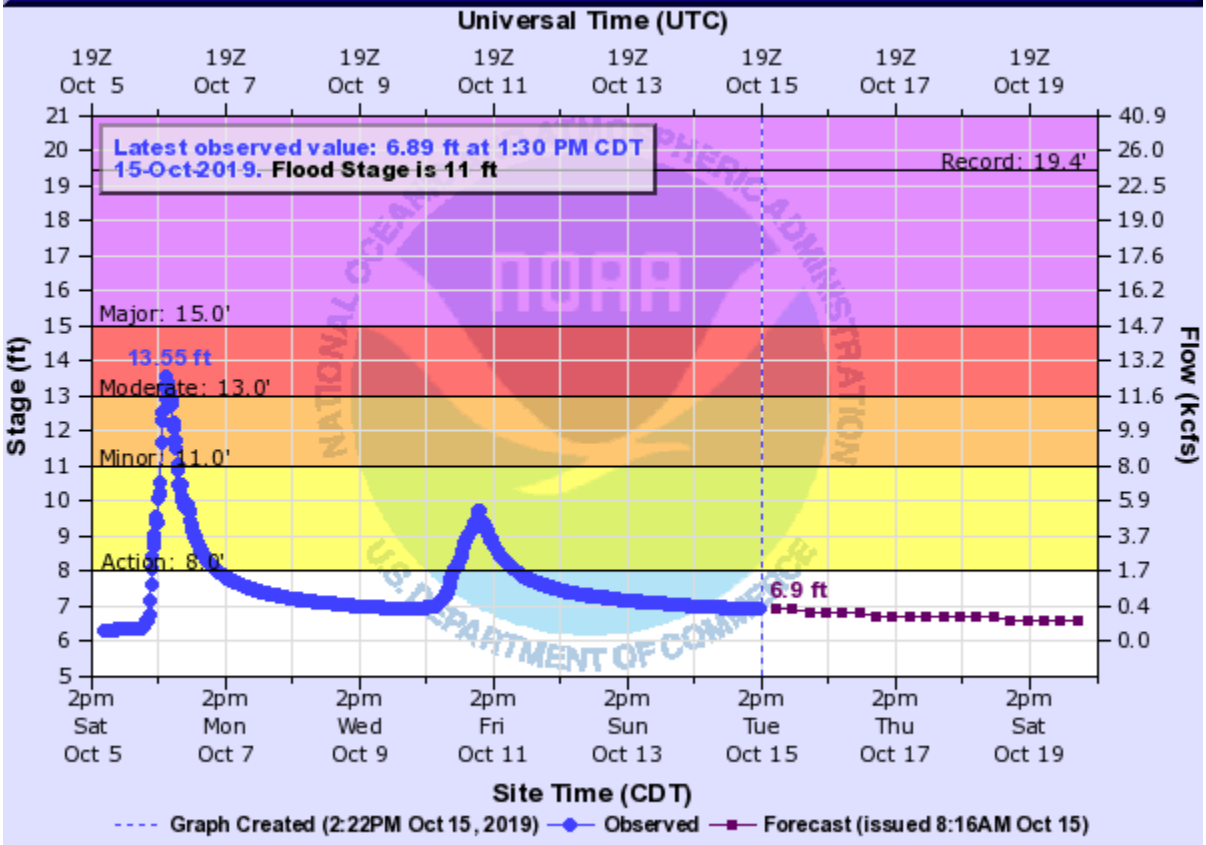
ILLINOIS RIVER (AR OK) NEAR TAHLEQUAH



TALO2(plotting HGIRG) "Gage 0" Datum: 664.14'

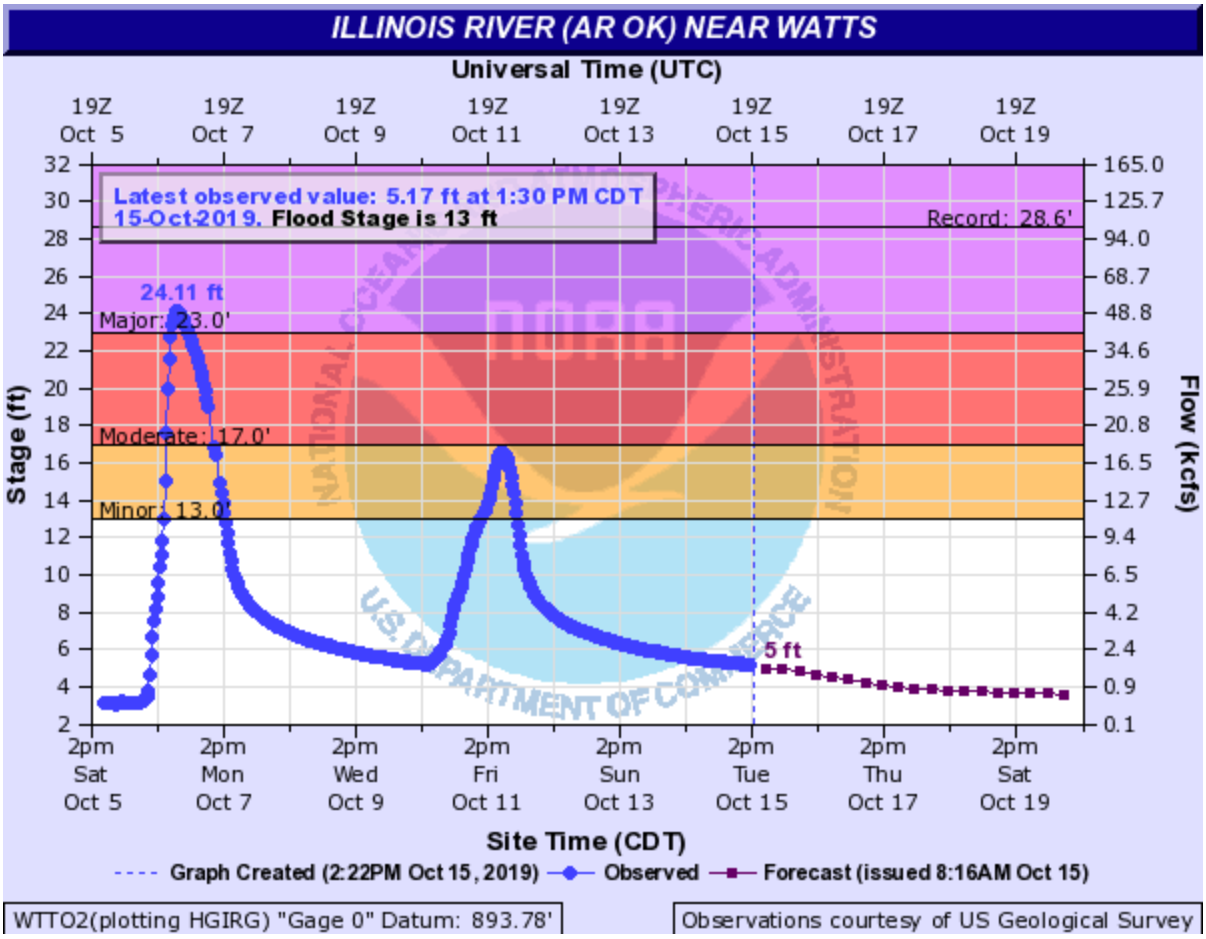
Observations courtesy of US Geological Survey

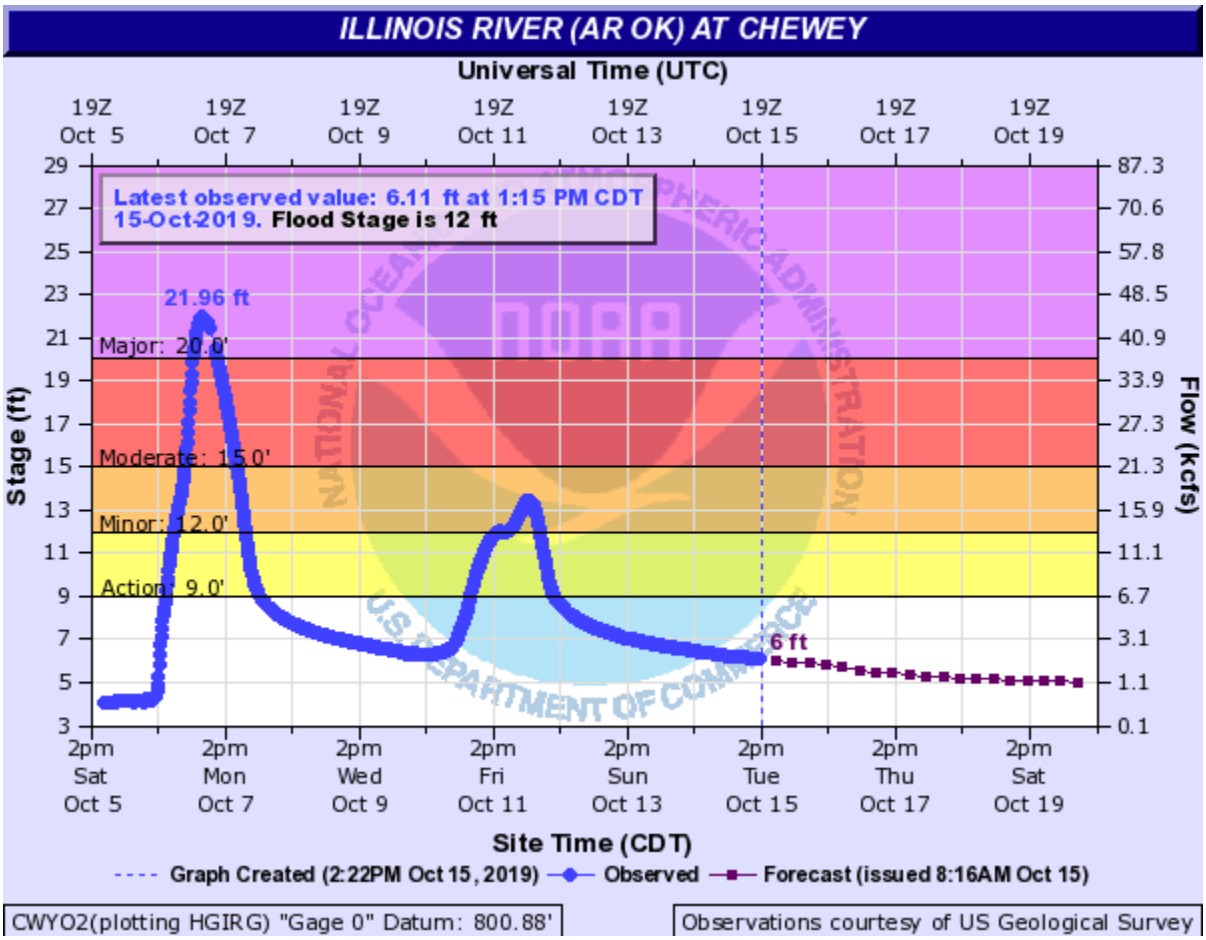
FLINT CREEK (OK) NEAR KANSAS

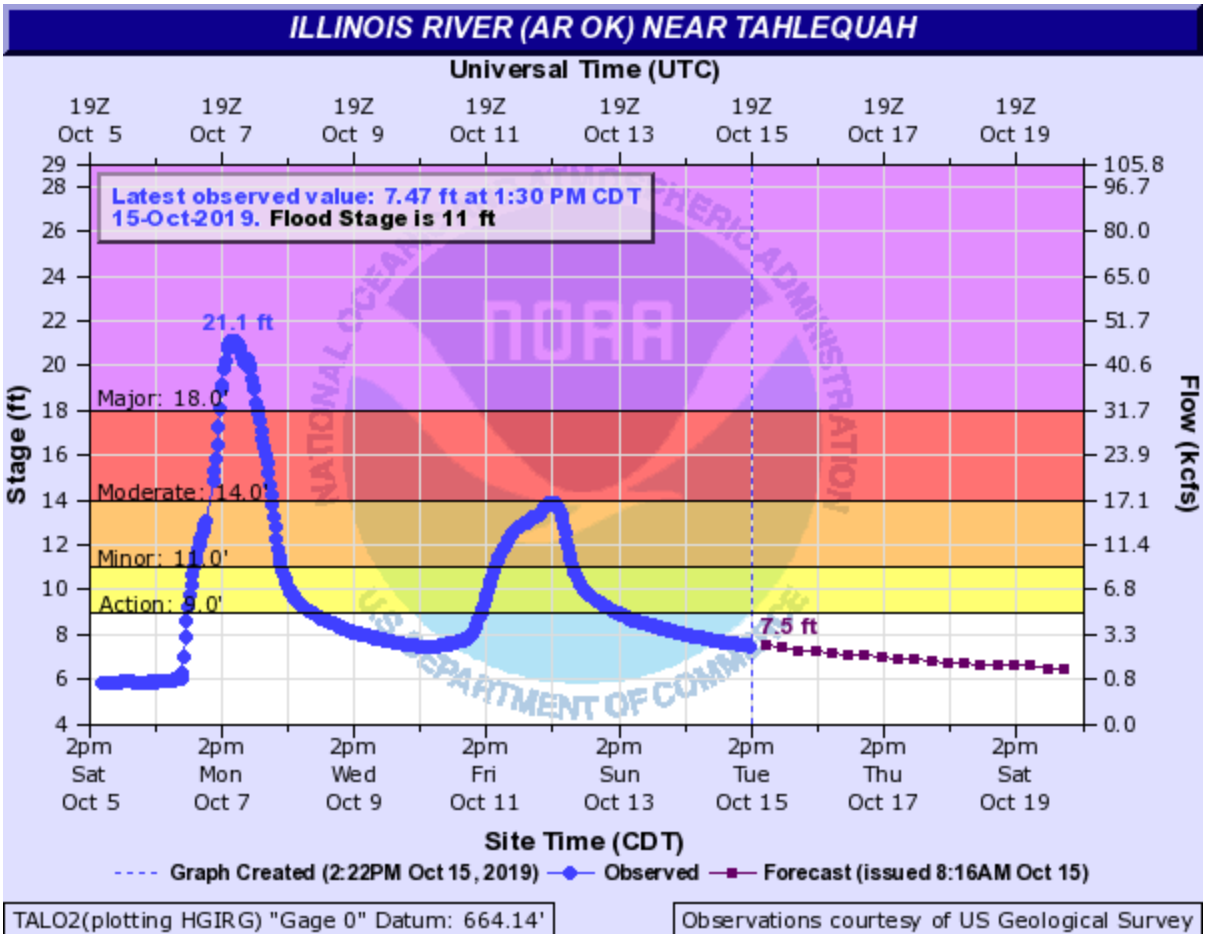


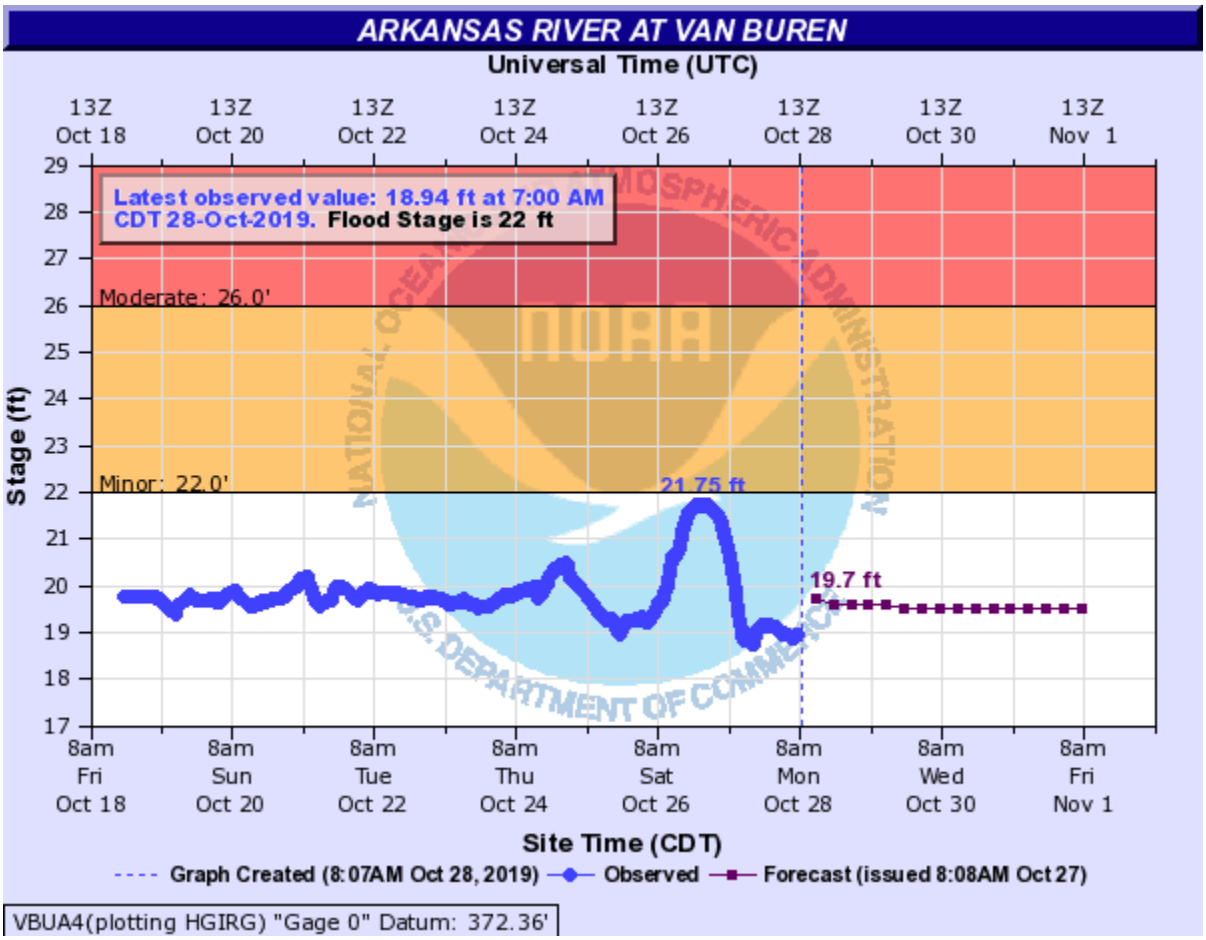
KNSO2(plotting HGIRG) "Gage 0" Datum: 854.59'

Observations courtesy of US Geological Survey

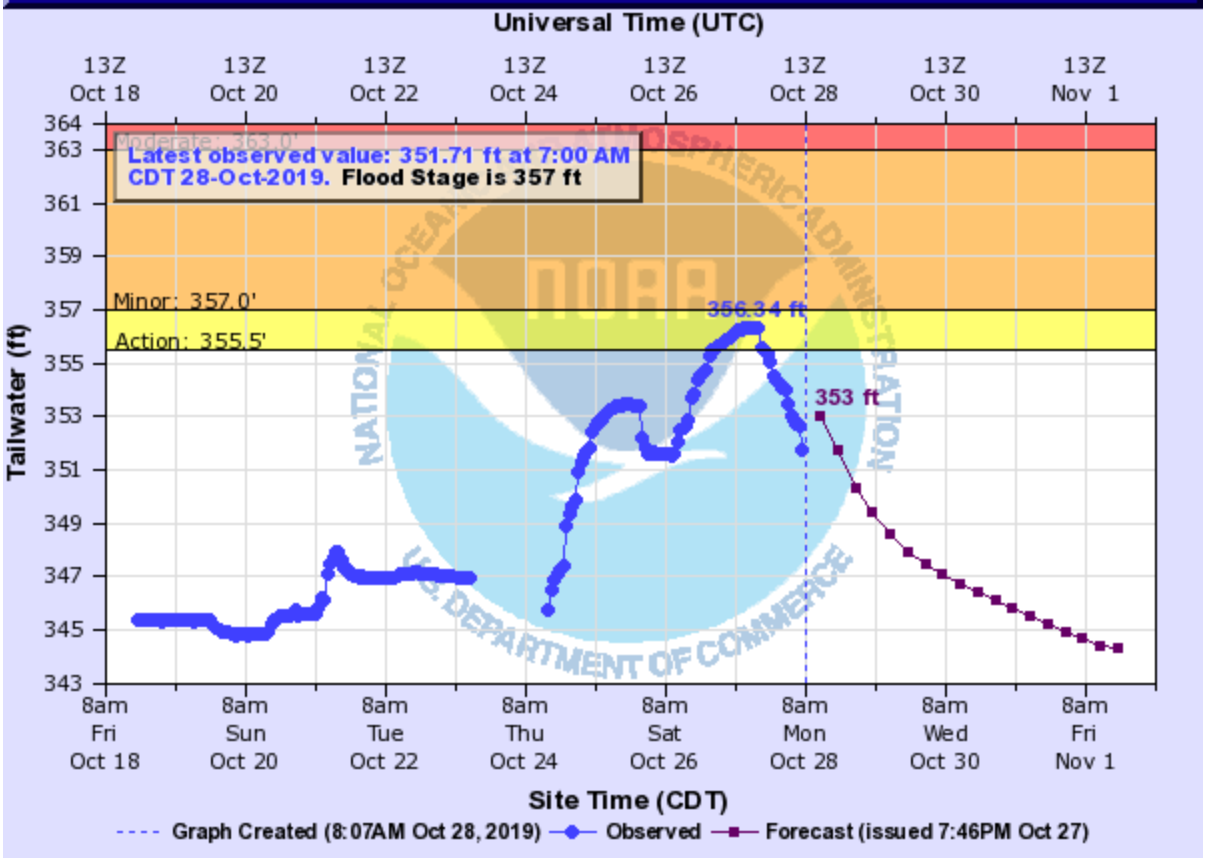

ILLINOIS RIVER (AR OK) NEAR WATTS
Universal Time (UTC)
19Z Oct 5
19Z Oct 7
19Z Oct 9
19Z Oct 11
19Z Oct 13
19Z Oct 15
19Z Oct 17
19Z Oct 19
Latest observed value: 5.17 ft at 1:30 PM CDT 15-Oct-2019. Flood Stage is 13 ft
Record: 28.6'
24.11 ft
Major: 23.0'
Moderate: 17.0'
Minor: 13.0'
5 ft
Stage (ft)
Flow (kcfs)
2pm Sat Oct 5
2pm Mon Oct 7
2pm Wed Oct 9
2pm Fri Oct 11
2pm Sun Oct 13
2pm Tue Oct 15
2pm Thu Oct 17
2pm Sat Oct 19
Site Time (CDT)
Graph Created (2:22PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
WTTO2(plotting HGIRG) "Gage 0" Datum: 893.78'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) AT CHEWEY
Universal Time (UTC)
19Z Oct 5
19Z Oct 7
19Z Oct 9
19Z Oct 11
19Z Oct 13
19Z Oct 15
19Z Oct 17
19Z Oct 19
Latest observed value: 6.11 ft at 1:15 PM CDT 15-Oct-2019. Flood Stage is 12 ft
21.96 ft
Major: 20.0'
Moderate: 15.0'
Minor: 12.0'
Action: 9.0'
6 ft
Stage (ft)
Flow (kcfs)
2pm Sat Oct 5
2pm Mon Oct 7
2pm Wed Oct 9
2pm Fri Oct 11
2pm Sun Oct 13
2pm Tue Oct 15
2pm Thu Oct 17
2pm Sat Oct 19
Site Time (CDT)
Graph Created (2:22PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
CWYO2(plotting HGIRG) "Gage 0" Datum: 800.88'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) NEAR TAHLEQUAH
Universal Time (UTC)
19Z Oct 5
19Z Oct 7
19Z Oct 9
19Z Oct 11
19Z Oct 13
19Z Oct 15
19Z Oct 17
19Z Oct 19
Latest observed value: 7.47 ft at 1:30 PM CDT 15-Oct-2019. Flood Stage is 11 ft
21.1 ft
Major: 18.0'
Moderate: 14.0'
Minor: 11.0'
Action: 9.0'
7.5 ft
Stage (ft)
Flow (kcfs)
29
28
26
24
22
20
18
16
14
12
10
8
6
4
105.8
96.7
80.0
65.0
51.7
40.6
31.7
23.9
17.1
11.4
6.8
3.3
0.8
0.0
2pm Sat Oct 5
2pm Mon Oct 7
2pm Wed Oct 9
2pm Fri Oct 11
2pm Sun Oct 13
2pm Tue Oct 15
2pm Thu Oct 17
2pm Sat Oct 19
Site Time (CDT)
Graph Created (2:22PM Oct 15, 2019)
Observed
Forecast (issued 8:16AM Oct 15)
TALO2(plotting HGIRG) "Gage 0" Datum: 664.14'
Observations courtesy of US Geological Survey


ARKANSAS RIVER AT VAN BUREN
Universal Time (UTC)
13Z Oct 18
13Z Oct 20
13Z Oct 22
13Z Oct 24
13Z Oct 26
13Z Oct 28
13Z Oct 30
13Z Nov 1
Latest observed value: 18.94 ft at 7:00 AM CDT 28-Oct-2019. Flood Stage is 22 ft
Moderate: 26.0'
Minor: 22.0'
21.75 ft
19.7 ft
Stage (ft)
29
28
27
26
25
24
23
22
21
20
19
18
17
8am Fri Oct 18
8am Sun Oct 20
8am Tue Oct 22
8am Thu Oct 24
8am Sat Oct 26
8am Mon Oct 28
8am Wed Oct 30
8am Fri Nov 1
Site Time (CDT)
Graph Created (8:07AM Oct 28, 2019)
Observed
Forecast (issued 8:08AM Oct 27)
VBUA4(plotting HGIRG) "Gage 0" Datum: 372.36'

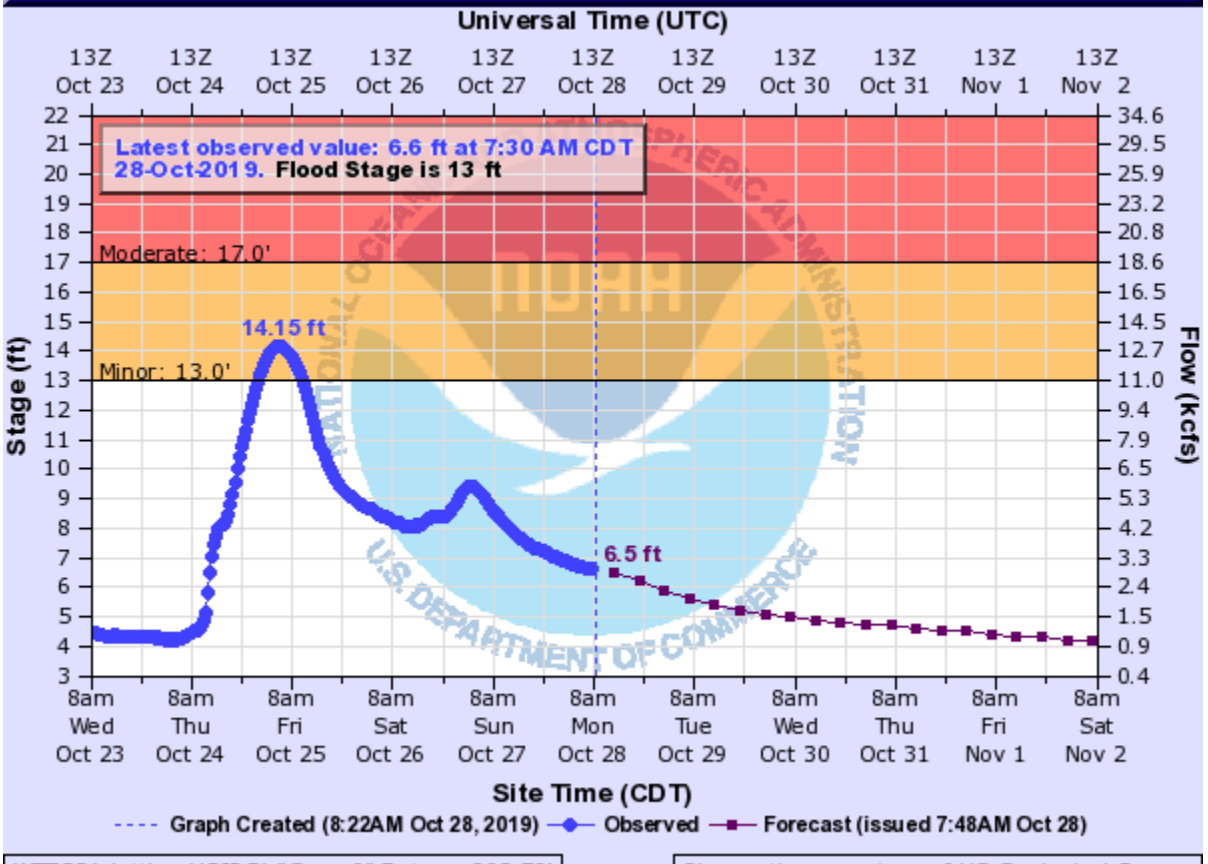
ARKANSAS RIVER AT OZARK L/D TAILWATER



OZGA4(plotting HTIRG) "Gage 0" Datum: 0'

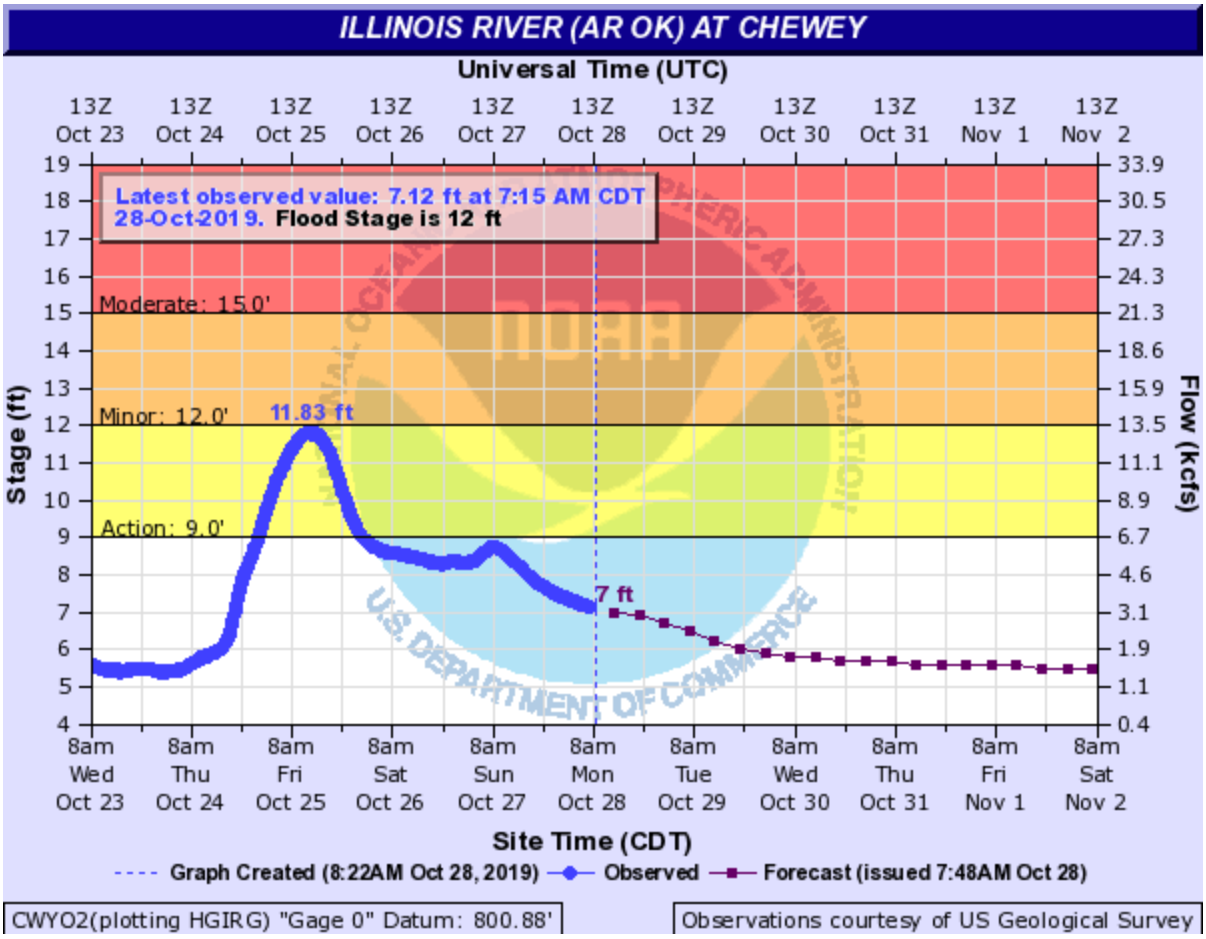
Observations courtesy of US Army Corps of Engineers - LRD

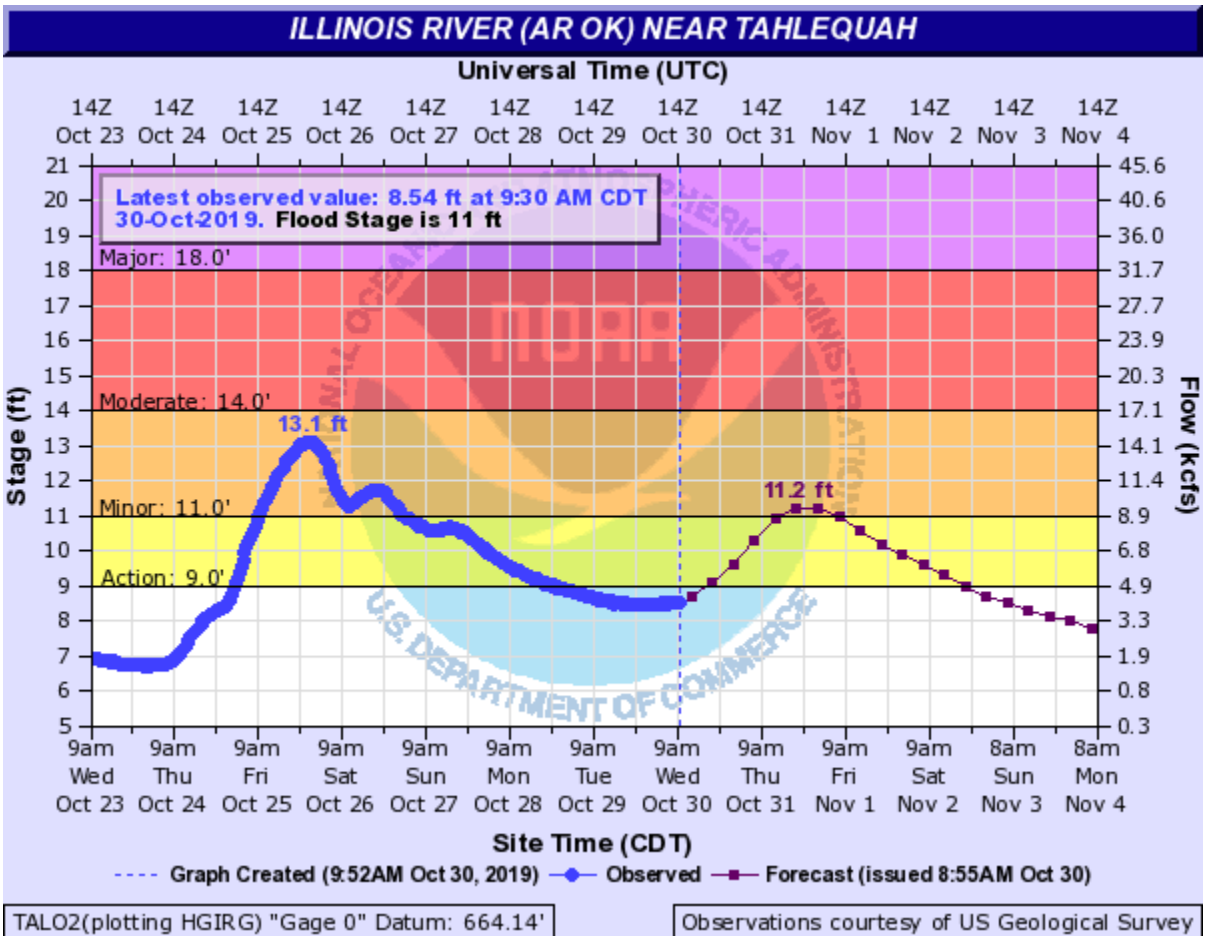
ILLINOIS RIVER (AR OK) NEAR WATTS

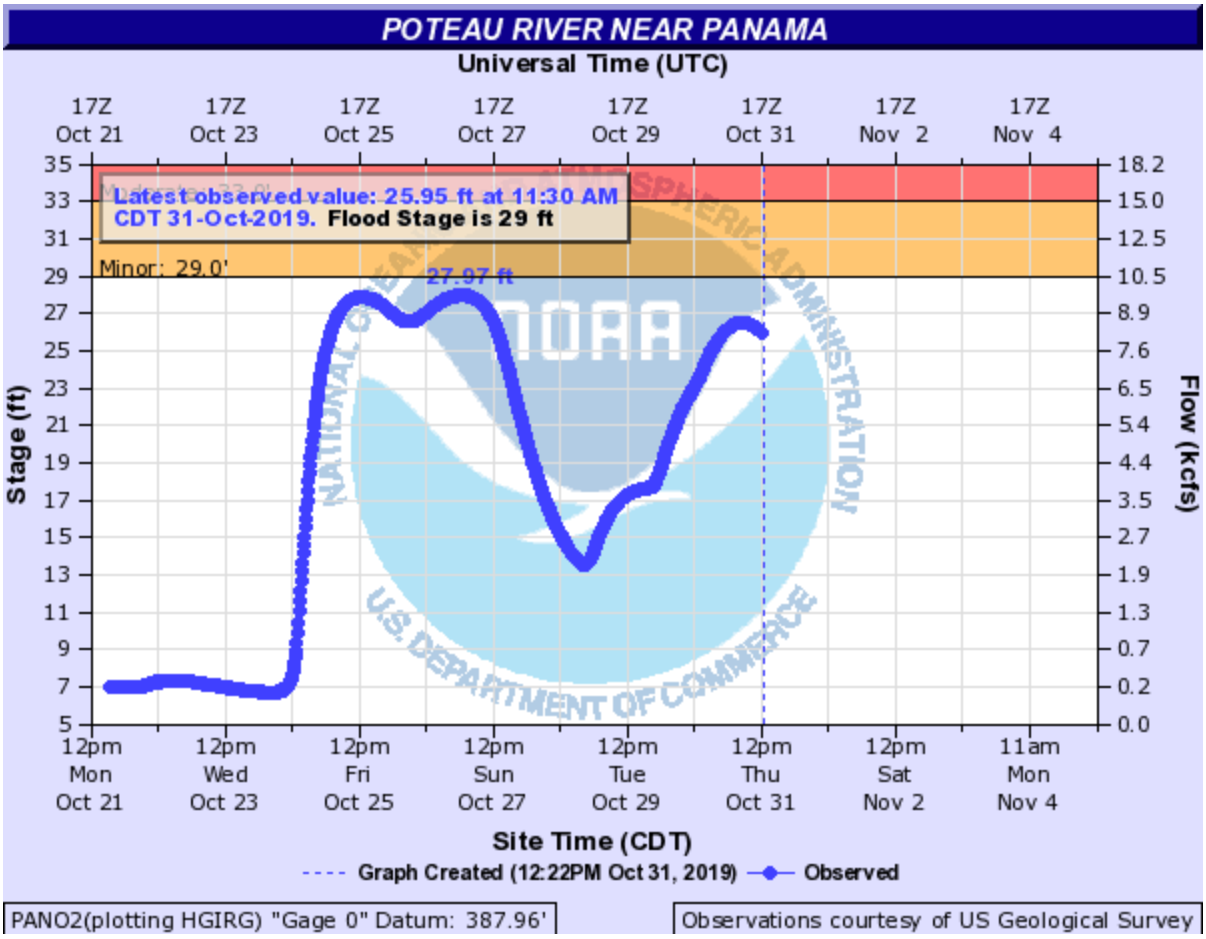


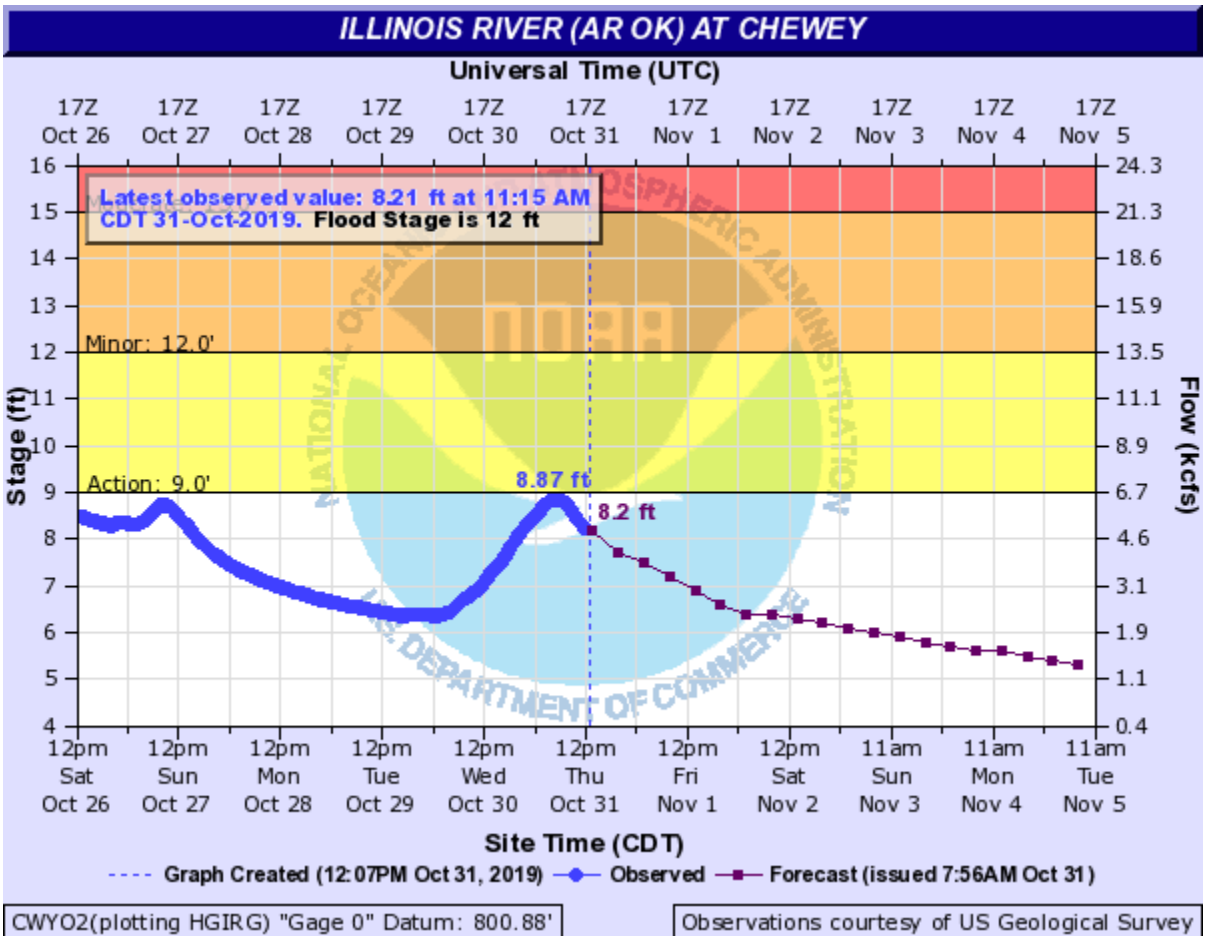
WTTO2(plotting HGIRG) "Gage 0" Datum: 893.78'

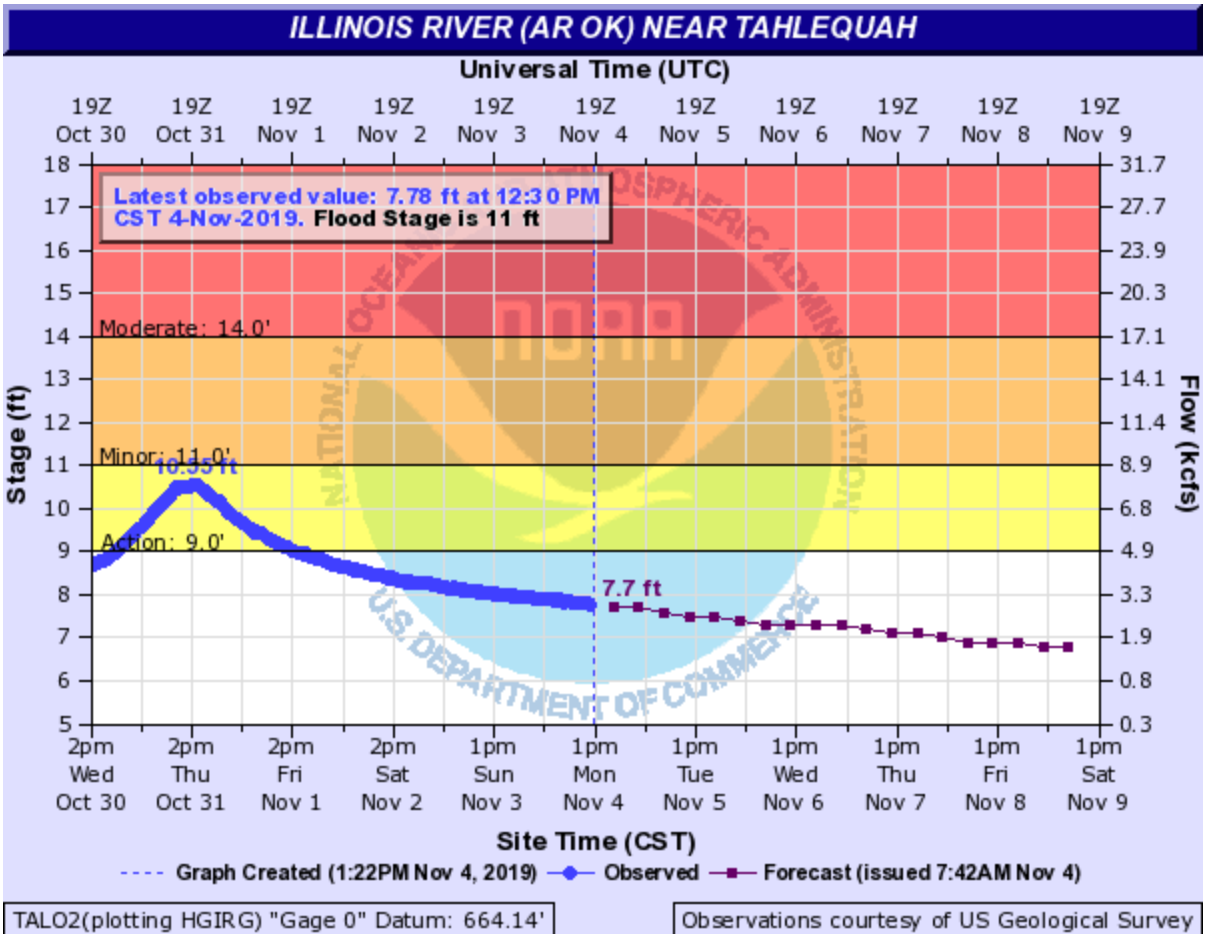
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) AT CHEWEY
Universal Time (UTC)
13Z Oct 23
13Z Oct 24
13Z Oct 25
13Z Oct 26
13Z Oct 27
13Z Oct 28
13Z Oct 29
13Z Oct 30
13Z Oct 31
13Z Nov 1
13Z Nov 2
Latest observed value: 7.12 ft at 7:15 AM CDT 28-Oct-2019. Flood Stage is 12 ft
Moderate: 15.0'
Minor: 12.0'
Action: 9.0'
11.83 ft
7 ft
Stage (ft)
Flow (kcfs)
19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4
33.9 30.5 27.3 24.3 21.3 18.6 15.9 13.5 11.1 8.9 6.7 4.6 3.1 1.9 1.1 0.4
8am Wed Oct 23
8am Thu Oct 24
8am Fri Oct 25
8am Sat Oct 26
8am Sun Oct 27
8am Mon Oct 28
8am Tue Oct 29
8am Wed Oct 30
8am Thu Oct 31
8am Fri Nov 1
8am Sat Nov 2
Site Time (CDT)
Graph Created (8:22AM Oct 28, 2019)
Observed
Forecast (issued 7:48AM Oct 28)
CWYO2(plotting HGIRG) "Gage 0" Datum: 800.88'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) NEAR TAHLEQUAH
Universal Time (UTC)
14Z Oct 23
14Z Oct 24
14Z Oct 25
14Z Oct 26
14Z Oct 27
14Z Oct 28
14Z Oct 29
14Z Oct 30
14Z Oct 31
14Z Nov 1
14Z Nov 2
14Z Nov 3
14Z Nov 4
Latest observed value: 8.54 ft at 9:30 AM CDT 30-Oct-2019. Flood Stage is 11 ft
Major: 18.0'
Moderate: 14.0'
Minor: 11.0'
Action: 9.0'
13.1 ft
11.2 ft
Stage (ft)
Flow (kcfs)
21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5
45.6 40.6 36.0 31.7 27.7 23.9 20.3 17.1 14.1 11.4 8.9 6.8 4.9 3.3 1.9 0.8 0.3
9am Wed Oct 23
9am Thu Oct 24
9am Fri Oct 25
9am Sat Oct 26
9am Sun Oct 27
9am Mon Oct 28
9am Tue Oct 29
9am Wed Oct 30
9am Thu Oct 31
9am Fri Nov 1
9am Sat Nov 2
8am Sun Nov 3
8am Mon Nov 4
Site Time (CDT)
Graph Created (9:52AM Oct 30, 2019)
Observed
Forecast (issued 8:55AM Oct 30)
TALO2(plotting HGIRG) "Gage 0" Datum: 664.14'
Observations courtesy of US Geological Survey


POTEAU RIVER NEAR PANAMA
Universal Time (UTC)
17Z Oct 21
17Z Oct 23
17Z Oct 25
17Z Oct 27
17Z Oct 29
17Z Oct 31
17Z Nov 2
17Z Nov 4
Latest observed value: 25.95 ft at 11:30 AM CDT 31-Oct-2019. Flood Stage is 29 ft
Minor: 29.0'
27.97 ft
Stage (ft)
Flow (kcfs)
12pm Mon Oct 21
12pm Wed Oct 23
12pm Fri Oct 25
12pm Sun Oct 27
12pm Tue Oct 29
12pm Thu Oct 31
12pm Sat Nov 2
11am Mon Nov 4
Site Time (CDT)
Graph Created (12:22PM Oct 31, 2019)
Observed
PANO2(plotting HGIRG) "Gage 0" Datum: 387.96'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) AT CHEWEY
Universal Time (UTC)
17Z Oct 26
17Z Oct 27
17Z Oct 28
17Z Oct 29
17Z Oct 30
17Z Oct 31
17Z Nov 1
17Z Nov 2
17Z Nov 3
17Z Nov 4
17Z Nov 5
Latest observed value: 8.21 ft at 11:15 AM CDT 31-Oct-2019. Flood Stage is 12 ft
Minor: 12.0'
Action: 9.0'
8.87 ft
8.2 ft
Stage (ft)
Flow (kcfs)
12pm Sat Oct 26
12pm Sun Oct 27
12pm Mon Oct 28
12pm Tue Oct 29
12pm Wed Oct 30
12pm Thu Oct 31
12pm Fri Nov 1
12pm Sat Nov 2
11am Sun Nov 3
11am Mon Nov 4
11am Tue Nov 5
Site Time (CDT)
Graph Created (12:07PM Oct 31, 2019)
Observed
Forecast (issued 7:56AM Oct 31)
CWYO2(plotting HGIRG) "Gage 0" Datum: 800.88'
Observations courtesy of US Geological Survey


ILLINOIS RIVER (AR OK) NEAR TAHLEQUAH
Universal Time (UTC)
19Z Oct 30
19Z Oct 31
19Z Nov 1
19Z Nov 2
19Z Nov 3
19Z Nov 4
19Z Nov 5
19Z Nov 6
19Z Nov 7
19Z Nov 8
19Z Nov 9
Latest observed value: 7.78 ft at 12:30 PM CST 4-Nov-2019. Flood Stage is 11 ft
Moderate: 14.0'
Minor: 11.0'
Action: 9.0'
10.55 ft
7.7 ft
Stage (ft)
Flow (kcfs)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
31.7
27.7
23.9
20.3
17.1
14.1
11.4
8.9
6.8
4.9
3.3
1.9
0.8
0.3
2pm Wed Oct 30
2pm Thu Oct 31
2pm Fri Nov 1
2pm Sat Nov 2
1pm Sun Nov 3
1pm Mon Nov 4
1pm Tue Nov 5
1pm Wed Nov 6
1pm Thu Nov 7
1pm Fri Nov 8
1pm Sat Nov 9
Site Time (CST)
Graph Created (1:22PM Nov 4, 2019)
Observed
Forecast (issued 7:42AM Nov 4)
TALO2(plotting HGIRG) "Gage 0" Datum: 664.14'
Observations courtesy of US Geological Survey