

East Tennessee State University

Digital Commons @ East Tennessee State University

Tennessee Climate Office Monthly Report

7-1-2019

2019 July - Tennessee Monthly Climate Report

Tennessee Climate Office, East Tennessee State University

Follow this and additional works at: <https://dc.etsu.edu/tn-climate-monthly-reports>



Part of the [Climate Commons](#), and the [Meteorology Commons](#)

Recommended Citation

Tennessee Climate Office, East Tennessee State University, "2019 July - Tennessee Monthly Climate Report" (2019). *Tennessee Climate Office Monthly Report*. 23.

<https://dc.etsu.edu/tn-climate-monthly-reports/23>

This Report is brought to you for free and open access by Digital Commons @ East Tennessee State University. It has been accepted for inclusion in Tennessee Climate Office Monthly Report by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact digilib@etsu.edu.

July 2019 Tennessee State Climate Summary

Tennessee Climate Office * East Tennessee State University

Prepared by William Tollefson and Dr. Andrew Joyner

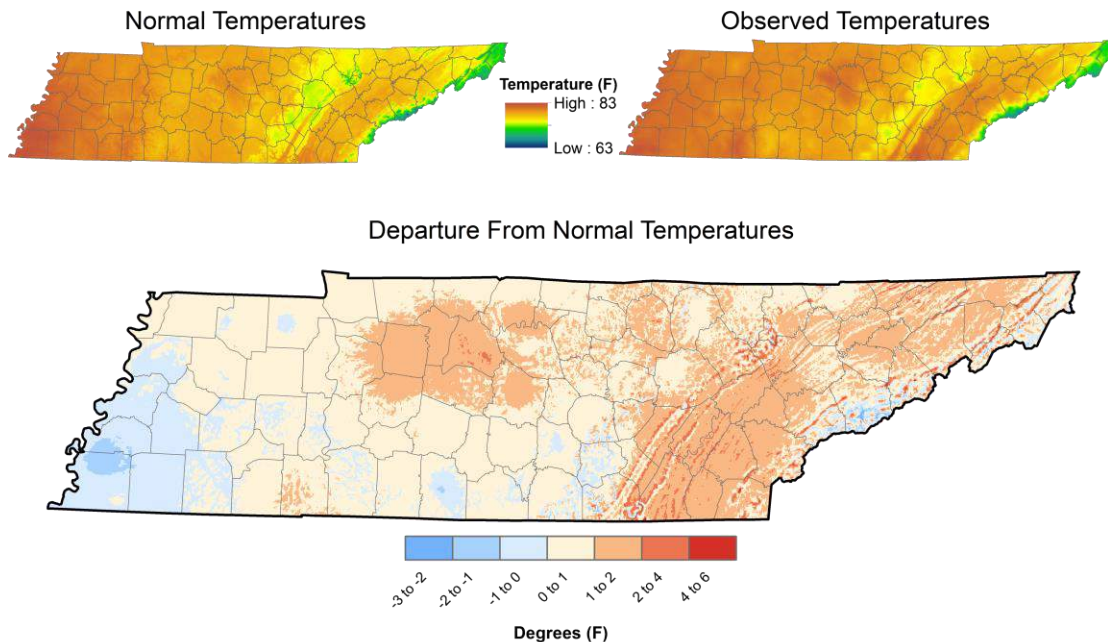
With contributions by Climate Data Representatives at University of Tennessee-Martin, Vanderbilt University, and University of Tennessee-Institute of Agriculture

Monthly Temperature Summary:

Temperatures in July were above normal for most of East Tennessee and the Nashville metro area (1-2°F), and below normal for southwest Tennessee. Two heat waves occurred during the month with high temperatures in the mid to upper-nineties across the state, and heat index values as high as 110°F. Heat advisories and excessive heat warnings were issued for portions of West and Middle Tennessee for July 17th and 18th. For the second half of the month, temperatures in West Tennessee were lower than normal due to persistent cloud cover from the remnants of Hurricane Barry, and a strong cold front that swept the state. From the 23rd to 27th record low temperatures were set in some locations.



July 2019 Mean Temperature



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
GERMANTOWN 4SE	COOP	82.5
MEMPHIS INTERNATIONAL AP	WBAN	81.5
CHATTANOOGA AP	WBAN	81.4
NASHVILLE INTL AP	WBAN	81.4
NASHVILLE BERRY FIELD	COOP	81.1

Map Data From: PRISM Climate Group, Oregon State University, 1981-2010 Normals Used
Station Data retrieved from SC ACIS2

Stations with the lowest mean temperature

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	58.5
NEWFOUND GAP	COOP	66.7
ROAN MOUNTAIN 3SW	COOP	69.6
CHEROKEE TENNESSEE	RAWS	70.7
TOWNSEND 5S	COOP	72.3

Monthly Precipitation Summary:

Precipitation was above normal for the majority of the state, with the exception of southeast Tennessee, where parts of Hamilton and Marion counties recorded less than half their normal rainfall amounts. The remnants of Hurricane Barry brought widespread rains to West Tennessee in the middle of the month, and a cold front towards the end of the month produced heavy rains in northern sections of Middle and East Tennessee. Otherwise, rainfall was mostly associated with scattered thunderstorm activity, and was highly variable. Weekly rainfall totals ranging from 1/10th of an inch to several inches within a county were common. Wayne County recorded the most rainfall with training thunderstorms and an intense band of rainfall from the remnants of Barry.

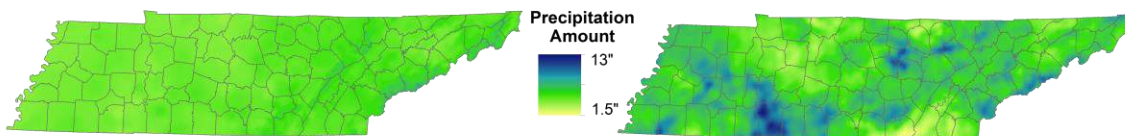


July 2019 Precipitation

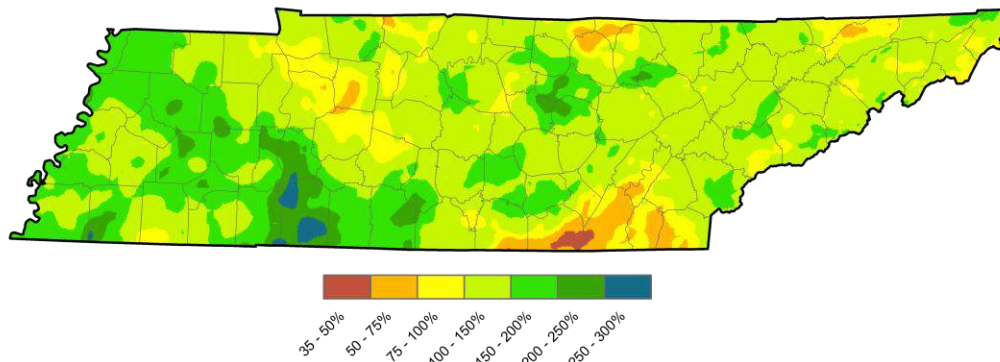


Normal Precipitation

Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
CLARKSVILLE 3.4 NNW	CoCoRaHS	17.54
JACKSON 4.3 N	CoCoRaHS	12.8
LEWISBURG 6.2 SSE	CoCoRaHS	12.4
COOKEVILLE 5.4 WNW	CoCoRaHS	12.05
CORNERSVILLE 3.6 SE	CoCoRaHS	11.93

Map Data From: PRISM Climate Group, Oregon State University, 1981-2010 Normals Used, Station Data retrieved from SC ACIS2

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
SPRING HILL 2.8 ENE	CoCoRaHS	1.52
DICKSON 6.7 SSW	CoCoRaHS	1.64
THOMPSON STATION	COOP	1.89
BYRDSTOWN 8.7 E	CoCoRaHS	2.05
CHATTANOOGA 5.1 ENE	CoCoRaHS	2.42

Station Data and Top Tenn. (warmest/wettest, coldest/driest stations of the month):

Station Name	Temperatures (°F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
Memphis	89.7	73.4	81.5	-1.1	95	7/8	62	7/25	7.53	2.94	164%
Jackson	89.1	69.4	79.3	-0.2	94	7/20+	55	7/25	10.50	6.01	233%
Clarksville	88.3	69.1	78.7	0.6	93	7/9	57	7/25	6.96	3.04	177%
Nashville	91.4	71.4	81.4	2.0	97	7/20	60	7/25	4.81	1.17	132%
Chattanooga	91.4	71.5	81.4	1.4	99	7/9	61	7/25	4.86	-0.05	98%
Crossville	83.2	65.1	74.2	-0.5	89	7/9	52	7/24	5.79	0.64	112%
Knoxville	88.7	69.3	79.0	0.6	95	7/9	57	7/24	5.88	0.80	115%
Bristol	87.5	65.9	76.7	2.1	92	7/16	54	7/25	3.35	-1.34	71%

Hottest Stations (highest maximum temperature)

Station Name	Station Type	Highest Temperature (F)
CHATTANOOGA AP	WBAN	99
GERMANTOWN 4SE	COOP	98
MEMPHIS WFO	WBAN	97
NASHVILLE INTL AP	WBAN	97
MEIGS EOC TENNESSEE	RAWS	97
SHILOH NMP TENNESSEE	RAWS	97
OAK RIDGE ASOS	WBAN	96
BIG SOUTH TENNESSEE	RAWS	96
LEWISBURG EXP STA	COOP	96
PIKEVILLE	COOP	96
JACKSON EXP STA	COOP	96
WOODBURY 1 WNW	COOP	96
SEVIERVILLE	COOP	96
LEBANON	COOP	96
SPRINGFIELD EXP STA	COOP	96
NASHVILLE BERRY FIELD	COOP	96
CHEATHAM LOCK & DAM	COOP	96

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)
MT LECONTE	COOP	37
ROAN MOUNTAIN 3SW	COOP	47
NEWFOUND GAP	COOP	47
CHEROKEE TENNESSEE	RAWS	49
ERWIN 1 W	COOP	50
CROSSVILLE 7 NW	WBAN	51
COALMONT	COOP	51
CROSSVILLE MEMORIAL AP	WBAN	52
BLEDSON SF TENNESSEE	RAWS	52
COKER CREEK TENNESSEE	RAWS	52
GATLINBURG 2 SW	COOP	52
JAMESTOWN	COOP	52
TAZEWELL	COOP	52
ONEIDA	COOP	52
TOWNSEND 5S	COOP	52

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
GERMANTOWN 4SE	COOP	82.5
MEMPHIS INTERNATIONAL AP	WBAN	81.5
CHATTANOOGA AP	WBAN	81.4
NASHVILLE INTL AP	WBAN	81.4
NASHVILLE BERRY FIELD	COOP	81.1
SHILOH NMP TENNESSEE	RAWS	81
MEMPHIS WFO	WBAN	80.7
SELMER	COOP	80.2
CAMDEN TOWER TENNESSEE	RAWS	80
JACKSON EXP STA	COOP	80

Cooltest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	58.5
NEWFOUND GAP	COOP	66.7
ROAN MOUNTAIN 3SW	COOP	69.6
CHEROKEE TENNESSEE	RAWS	70.7
TOWNSEND 5S	COOP	72.3
GATLINBURG 2 SW	COOP	72.7
CROSSVILLE 7 NW	WBAN	73
COALMONT	COOP	73.3
CROSSVILLE MEMORIAL AP	WBAN	74.1
TAZEWELL	COOP	74.2

Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
CLARKSVILLE 3.4 NNW	CoCoRaHS	17.54
JACKSON 4.3 N	CoCoRaHS	12.8
LEWISBURG 6.2 SSE	CoCoRaHS	12.4
COOKEVILLE 5.4 WNW	CoCoRaHS	12.05
CORNERSVILLE 3.6 SE	CoCoRaHS	11.93
WAYNESBORO	COOP	11.54
MEMPHIS 12.0 SE	CoCoRaHS	11.51
JACKSON EXP STA	COOP	11.36
JACKSON 4 NE	COOP	11.34
BEERSHEBA SPRINGS 2.1 ENE	CoCoRaHS	11.34

Driest Stations (lowest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
SPRING HILL 2.8 ENE	CoCoRaHS	1.52
DICKSON 6.7 SSW	CoCoRaHS	1.64
THOMPSON STATION	COOP	1.89
BYRDSTOWN 8.7 E	CoCoRaHS	2.05
CHATTANOOGA 5.1 ENE	CoCoRaHS	2.42
CLEVELAND 5.2 SE	CoCoRaHS	2.62
DICKSON 12.7 NW	CoCoRaHS	2.62
MONTGOMERY BELL STATE PARK	COOP	2.64
MURFREESBORO STONES RIVER N.B.	COOP	2.83
VANLEER 2.8 SE	CoCoRaHS	2.83
LIVINGSTON 1.9 NNW	CoCoRaHS	2.83

Drought Monitor:

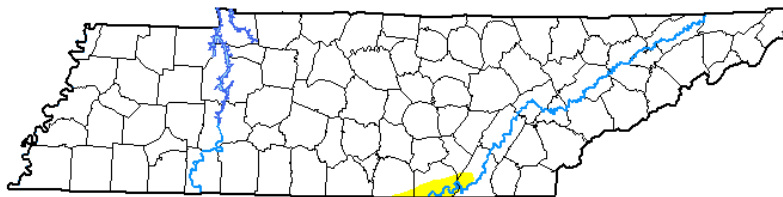
Widespread and soaking rainfall from the remnants of Hurricane Barry eliminated D0 drought conditions in West Tennessee, and areas of D0 conditions expanded and then contracted in southeast Tennessee. At the end of the month drought, conditions were cleared from all but southern sections of Hamilton, Marion, and extreme southeast Franklin Counties.

Author:

Curtis Riganti
National Drought
Mitigation Center

U.S. Drought Monitor Tennessee

July 30, 2019
(Released Thursday, Aug. 1, 2019)
Valid 8 a.m. EDT



Intensity:

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

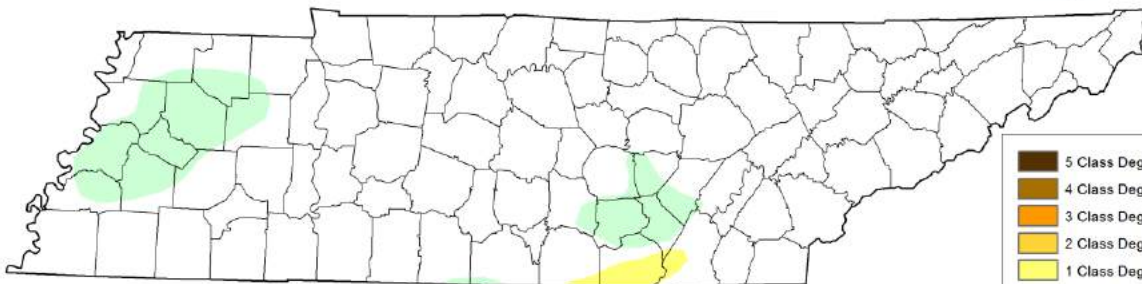
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



droughtmonitor.unl.edu

July 30, 2019
compared to
July 2, 2019

U.S. Drought Monitor Class Change - Tennessee 1 Month



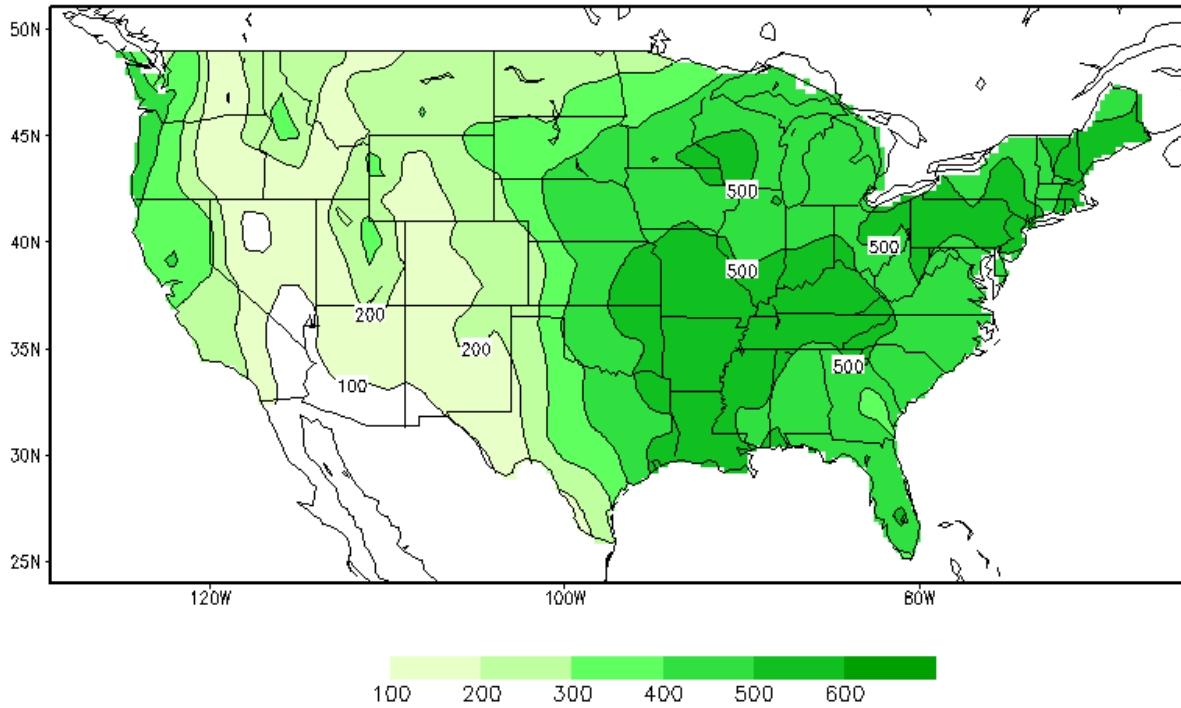
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

droughtmonitor.unl.edu

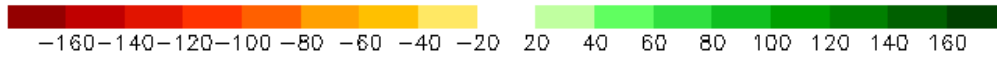
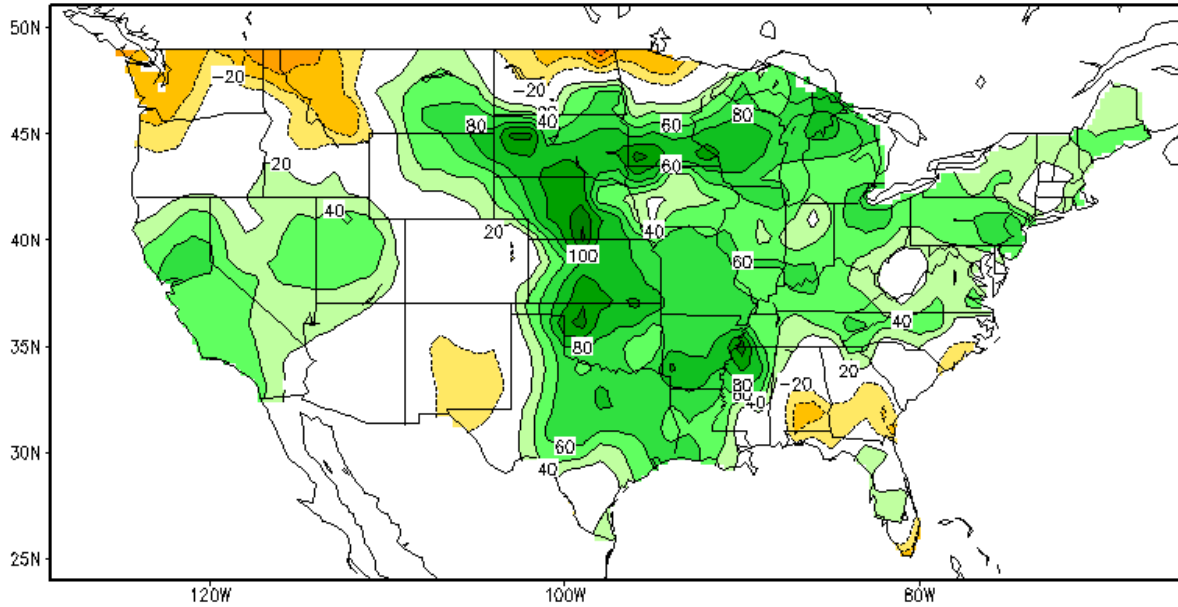
Soil Moisture:

Average soil moisture over the month was 500 mm across most of Tennessee, with the exception of southeast Tennessee where D0 drought conditions persisted. All the areas where soil moisture was at or above 500mm, were also above normal for the month.

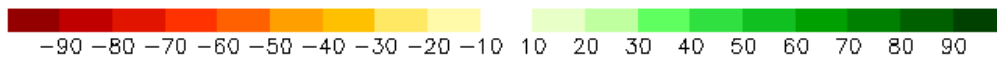
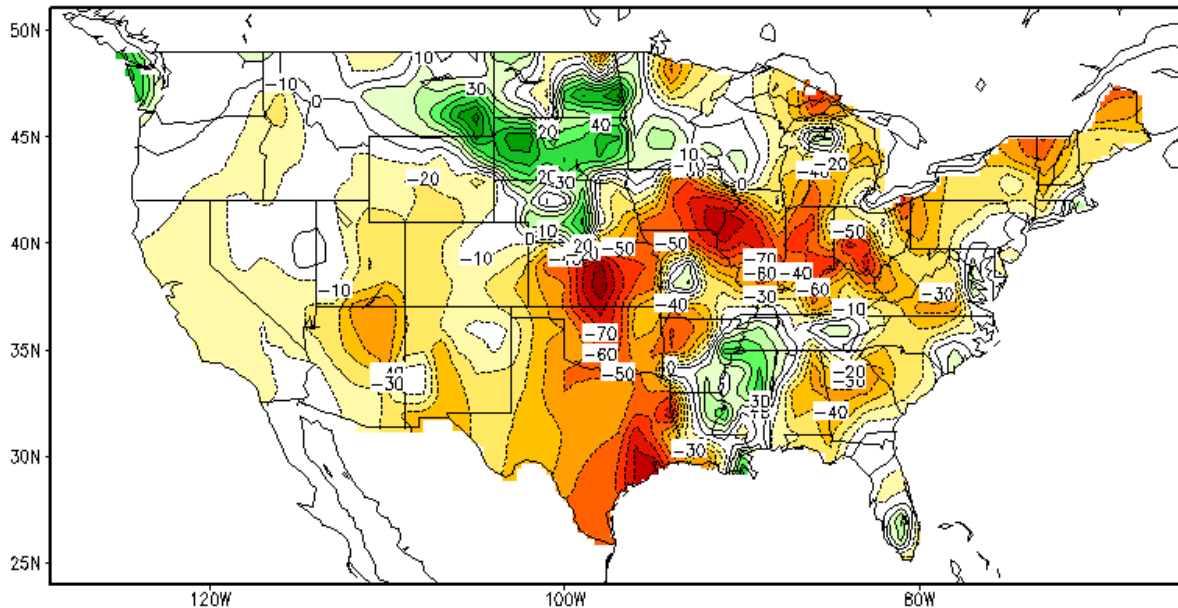
Calculated Soil Moisture (mm)
JUL, 2019



Calculated Soil Moisture Anomaly (mm) JUL, 2019



Calculated Soil Moisture Anomaly Change JUL 31, 2019 from JUN.30



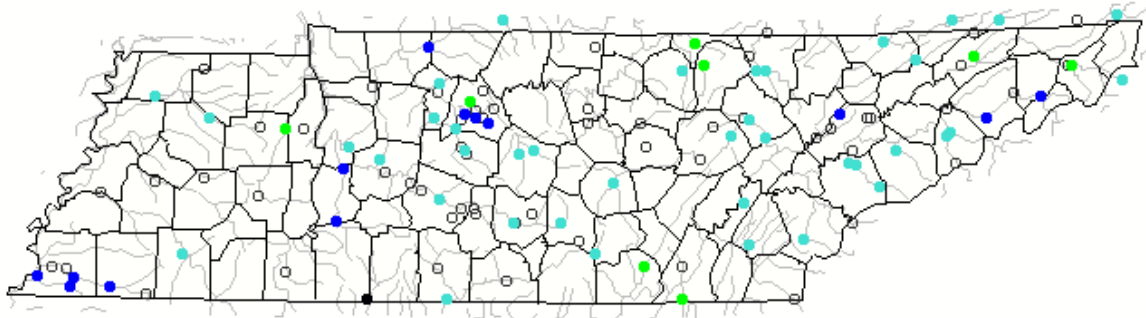
Streamflow:

All streams in the state averaged normal to much above normal flow rates for the month.

Map of monthly streamflow compared to historical streamflow for the month of the year (Tennessee)

Tennessee ▼ or Water-Resources Regions ▼

July 2019



Search USGS streamgage 🔍

Choose a data retrieval option and select a location on the map

- List of all stations
- Single station
- Nearest stations
- Peak flow

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

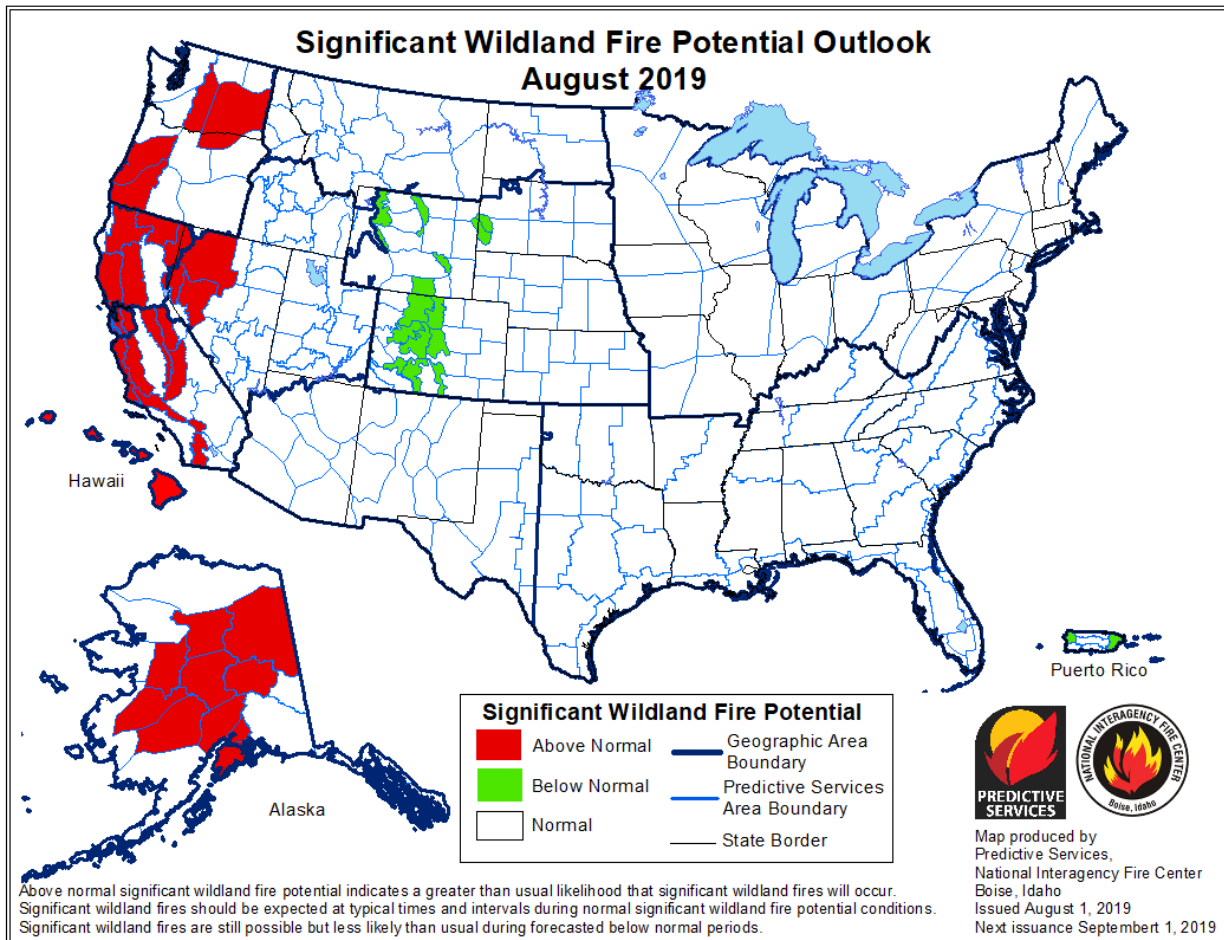
Miscellaneous:

Crop Conditions from USDA: High temperatures and humidity put stress on cattle during some parts of July, but cooler weather by the end of the month reduced the impact. Rainfall from the remnants of Hurricane Barry brought high rainfall totals to much of West Tennessee, further exacerbating bottom-land flooding in fields along the Mississippi River. Many producers doubt they will be able to plant in any of those bottom-land fields this year. Otherwise rainfall across the state was beneficial to crops, and many hay producers were able to get second or third cuttings in this month. The winter wheat harvest was completed in the first half of the month. Corn and tobacco crops are ahead of 5-year average progress, while cotton and soybeans are running a bit behind 5-year average progress.

Topsoil moisture was rated 1% very short, 7% short, 78% adequate, and 14% surplus. Subsoil moisture was rated 1% very short, 9% short, 81% adequate, and 9% surplus. Hay and roughage supplies were rated 2% very short, 13% short, 71%, and 14% surplus.

CROP PROGRESS					CONDITION					
Crop	This Week	Last Week	2018	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
	Percent					Percent				
Corn – Silking	94	88	96	96	Corn	1	2	13	59	25
Corn – Dough	66	45	76	65	Cotton	4	7	21	55	13
Cotton – Squaring	88	79	98	94	Soybeans	1	3	18	60	18
Cotton – Setting Bolls	47	24	67	59	Tobacco	7	18	34	30	11
Soybeans – Blooming	68	56	82	74	Pasture	1	5	25	57	12
Soybeans – Setting Pods	41	27	53	45	Hay	1	4	22	60	13
Tobacco – Topped	53	43	47	41						

Fire Danger: The wildland fire potential will be normal for all of Tennessee, along with the entire eastern half of the country during August.



Story of the Month:

The major climate stories of the month were the remnants of Hurricane Barry bringing widespread heavy rains to West Tennessee, as well as a strong cold front that brought below normal temperatures and record lows for the end of the month.

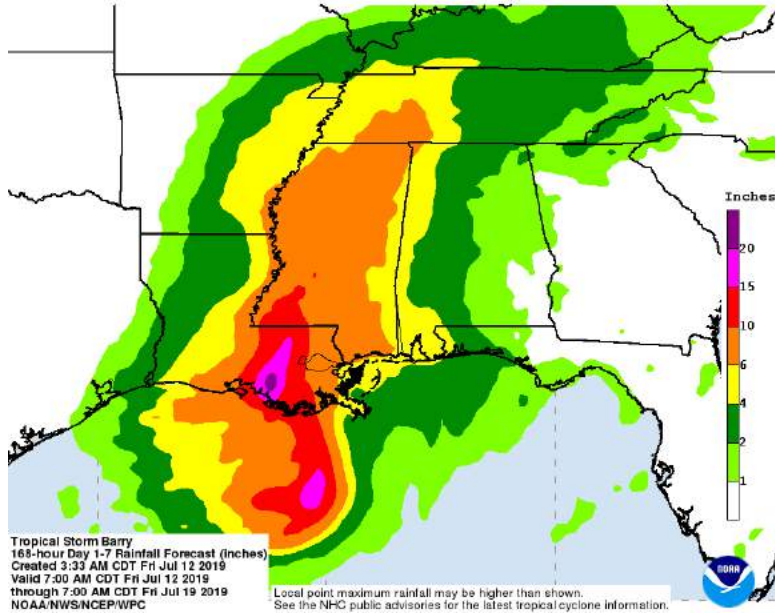
Barry started as an extra-tropical disturbance near southeast Tennessee on July 7th before tracking south through Georgia and out into the Gulf of Mexico where it formed into a Tropical Storm on July 12th and strengthened into a Category 1 hurricane just before landfall on the 13th. It then downgraded into a remnant low in Arkansas, but due to the lopsided shape of the storm, most of the rainfall fell to the east of the center of circulation.

Rainfall totals in West Tennessee matched well with the National Hurricane Center forecast with widespread totals of over 3 inches. Jackson recorded the most rainfall, with just over 7 inches of rain.

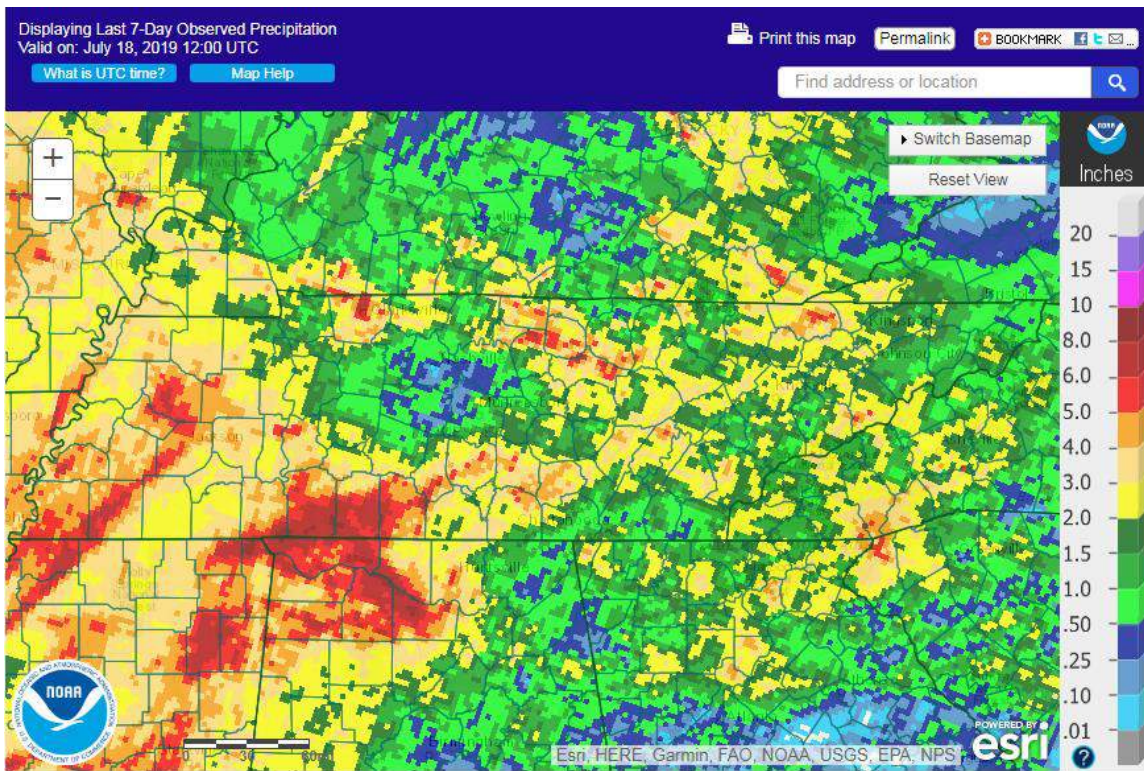
Rainfall from Barry caused a road to wash out and collapse under a car in Hardin County.



History of Tropical Cyclone Barry from July 7th to 14th [Source: Washington Post]



Forecast rainfall totals from tropical cyclone Barry (West TN was forecast to receive 4-6+” of rain from the system). [Image Source: NOAA National Hurricane Center]



Radar estimated rainfall from Barry (7-day rainfall from July 12-18), ranging from 2-6 inches across portions of West TN and southern Middle TN. [Image Source: NOAA AHPS]

Name	Station Type	Total Precipitation
JACKSON MCKELLAR- SIPES AP	WBAN	7.15
JACKSON EXP STA	COOP	7.01
LORETTO 5.2 NE	CoCoRaHS	6.88
LAWRENCEBURG 5.2 SW	CoCoRaHS	6.66
CORNERSVILLE 3.6 SE	CoCoRaHS	6.50
BELL BUCKLE 2.0 SE	CoCoRaHS	6.35
MEMPHIS 12.0 SE	CoCoRaHS	6.28
LEWISBURG 6.2 SSE	CoCoRaHS	6.20
COOKEVILLE 5.4 WNW	CoCoRaHS	6.09
MANCHESTER #2	COOP	5.95
CLARKSVILLE 3.4 NNW	CoCoRaHS	5.82
COOKEVILLE 4.6 WNW	CoCoRaHS	5.78
JACKSON 4.3 N	CoCoRaHS	5.72
JACKSON 4 NE	COOP	5.60
SOMERVILLE 1.7 N	CoCoRaHS	5.35
SOMERVILLE 1.3 E	CoCoRaHS	5.28
MEMPHIS INTERNATIONAL AP	WBAN	5.23

ACIS weather station rainfall from Barry (7-day period from July 12-18). The highest total occurred in Jackson, TN with over 7" of rain!



US National Weather Service Memphis Tennessee

9 hrs · 🌐

Even after the water recedes, flooding can have residual affects. The ground had washed out beneath this road which collapsed as this vehicle traveled over the weakened area.



Hardin County Fire Department Special Operations Division

👍 Like Page

18 hrs · 🌐

At 7:47 this morning Hardin county firefighters were dispatched to this vehicle accident on Cherry Chapel loop in the Walnut Grove community. Thankfully the 3 adults and a 5 month old infant made it out safely. The water had already receded before the accident and part of the road collapsed as they drove over it. This is another reminder to never drive through flooded roads, you never know the condition of the road!

The second major story of the month was a strong cold front that passed through the state bringing relief to the high temperatures and humidity during the last full week of the month. Average temperatures for the week ranged from 64°F in the highlands of Johnson County, to 76°F in southwest Tennessee and in McNairy and Hardin Counties. These average temperatures were below normal for the whole state. A good portion of the state, including almost all of West TN and most of Middle TN were 4-6°F below average for the week, while the remaining areas were 2-4°F below normal for the week. Several daily record low temperatures were set during the week, and Tennessee had some of the coldest July air we have seen since 2014.

Record Lows July 23: Crossville (56°F)

Record Lows July 24: Jackson (58°F), Crossville (52°F), Oak Ridge (57°F), Knoxville (57°F)

Record Lows July 25: Memphis (62°F), Jackson (55°F), Nashville (60°F), Crossville (54°F), Oak Ridge (60°F), Tri-Cities (54°F)

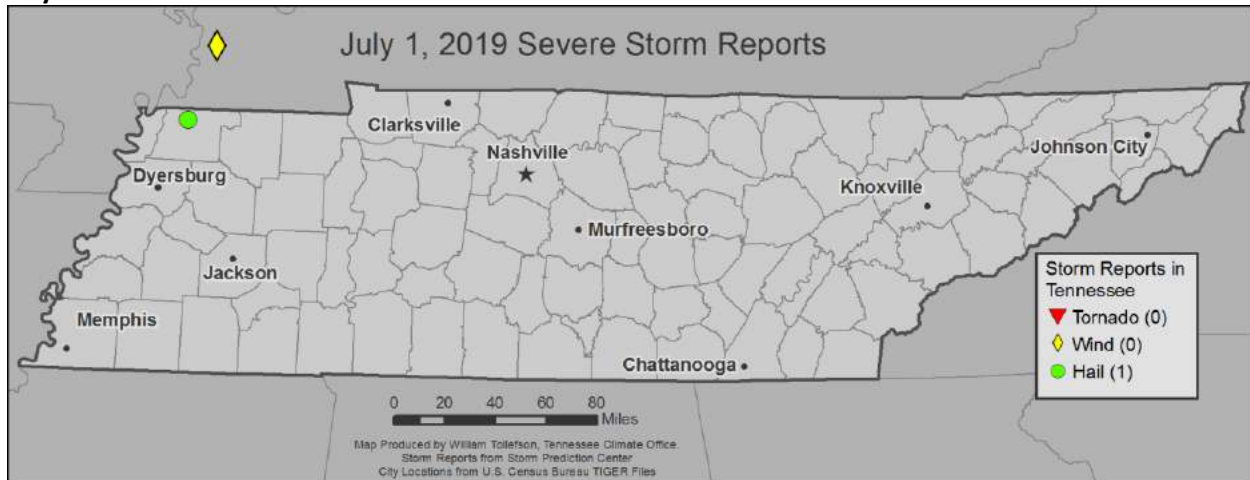
Record Lows July 26: Crossville (56°F), Oak Ridge (62°F)

Record Lows July 27: Oak Ridge (64°F)

Storm Reports:

Severe weather occurred on 7 days during the month resulting in a total of no reports of tornadoes, eleven reports of severe wind damage, and one report of hail 1" or larger.

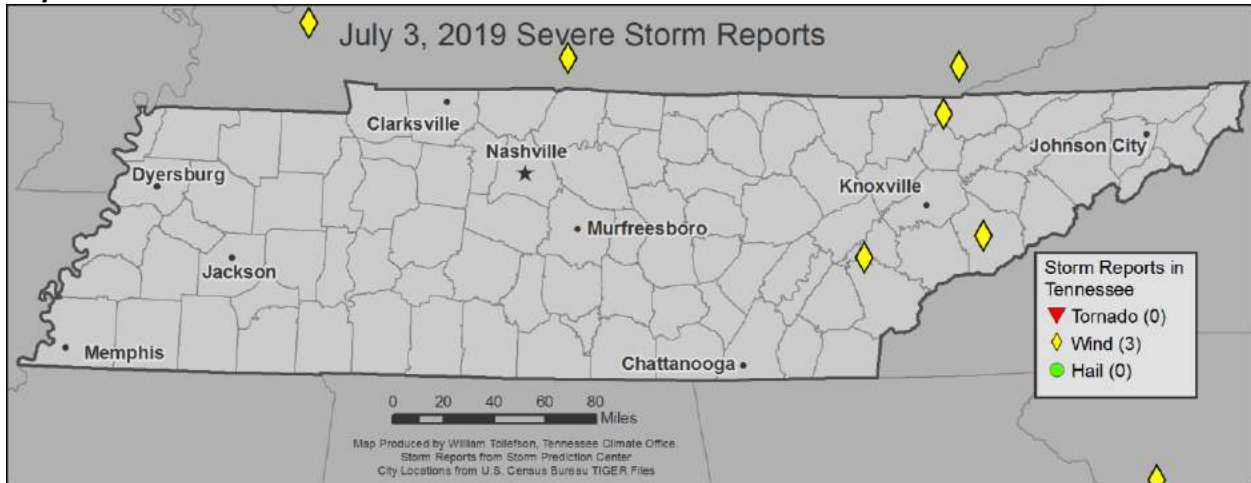
July 1:



Hail:

Time (UTC)	Size (in)	Location	County	Lat	Lon	Comments
23:00	1"	4 ESE CLAYTON	OBION	36.44	-89.19	HAIL BETWEEN THE SIZE OF A QUARTER AND HALF DOLLAR ALONG HIGHWAY 22 BETWEEN CLAYTON AND OLD FREEMONT. HAIL ALSO ACCOMPANIED BY WINDS ESTIMATED AROUND 50 MPH. (MEG)

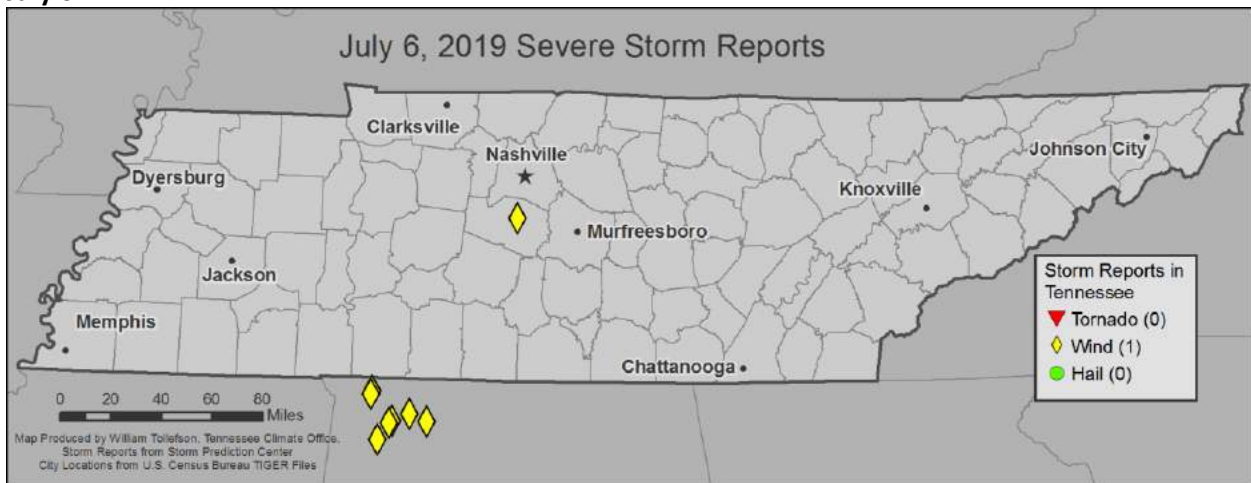
July 3:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
1:25	--	PHILADELPHIA	LOUDON	35.68	-84.4	MULTIPLE TREES DOWN ALONG HWY 11. ALSO SOME HAIL BUT SIZE UNKNOWN. (MRX)
1:44	--	4 NE SPEEDWELL	CLAIBORNE	36.49	-83.82	SEVERAL TREES DOWN ALONG HWY 63. (MRX)
3:20	--	PIGEON FORGE	SEVIER	35.79	-83.56	TREE DOWN ON HWY 441. (MRX)

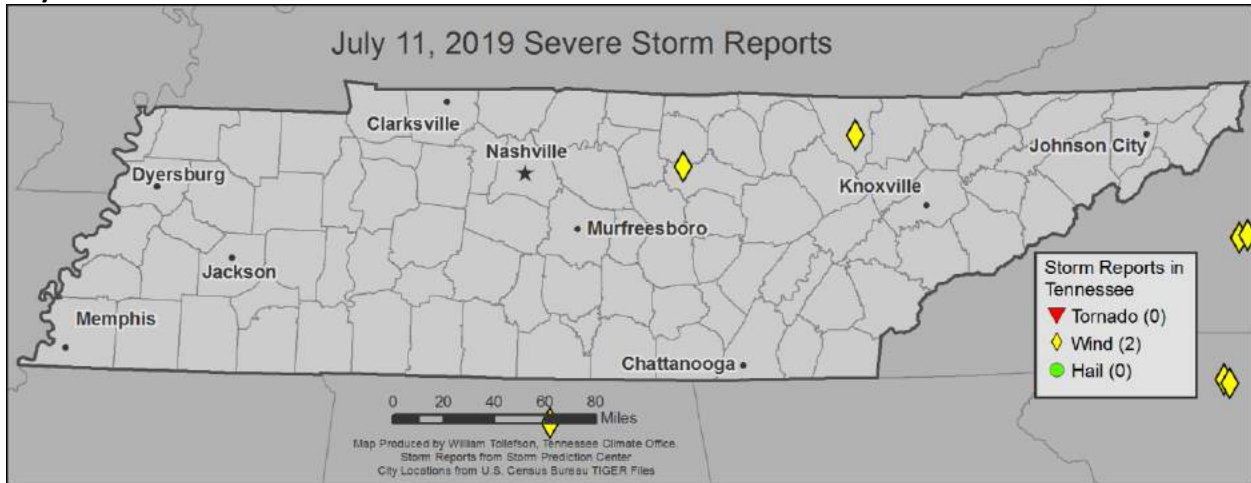
July 6:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
20:58	--	FRANKLIN	WILLIAMSON	35.93	-86.84	SEVERAL TWITTER REPORTS AND PHOTOS SHOWED SCATTERED TREES DOWN IN FRANKLIN. ONE TREE FELL ONTO A VEHICLE. (OHX)

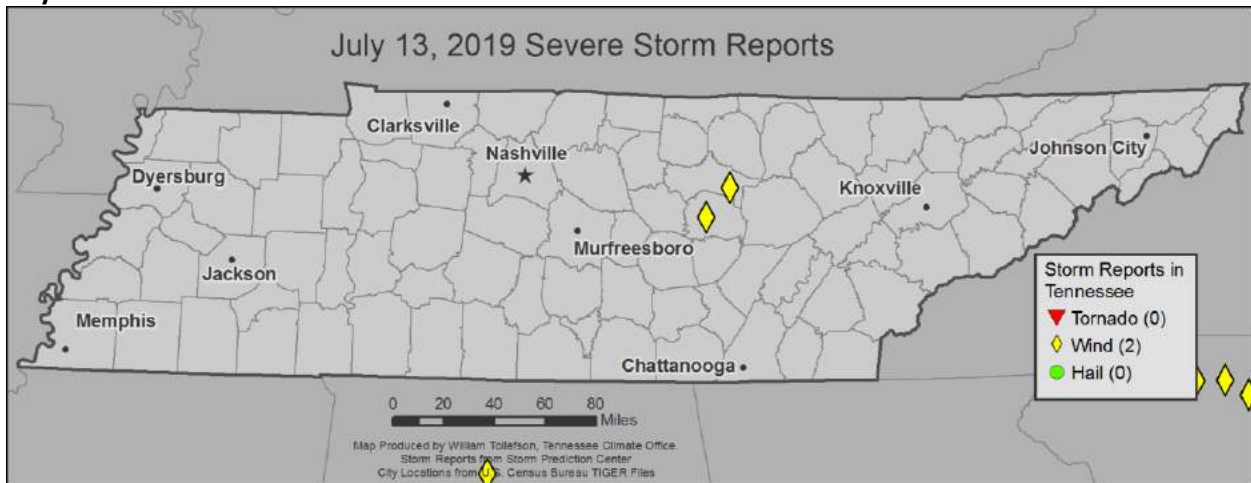
July 11:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
20:45	--	3 SE HUNTSVILLE	SCOTT	36.38	-84.45	1 TREE DOWN. (MRX)
1:05	--	10 WNW COOKEVILLE	PUTNAM	36.21	-85.67	SCATTERED TREE DAMAGE AND POWER OUTAGES... MOSTLY ACROSS NORTHERN AND WESTERN PORTIONS OF PUTNAM COUNTY (OHX)

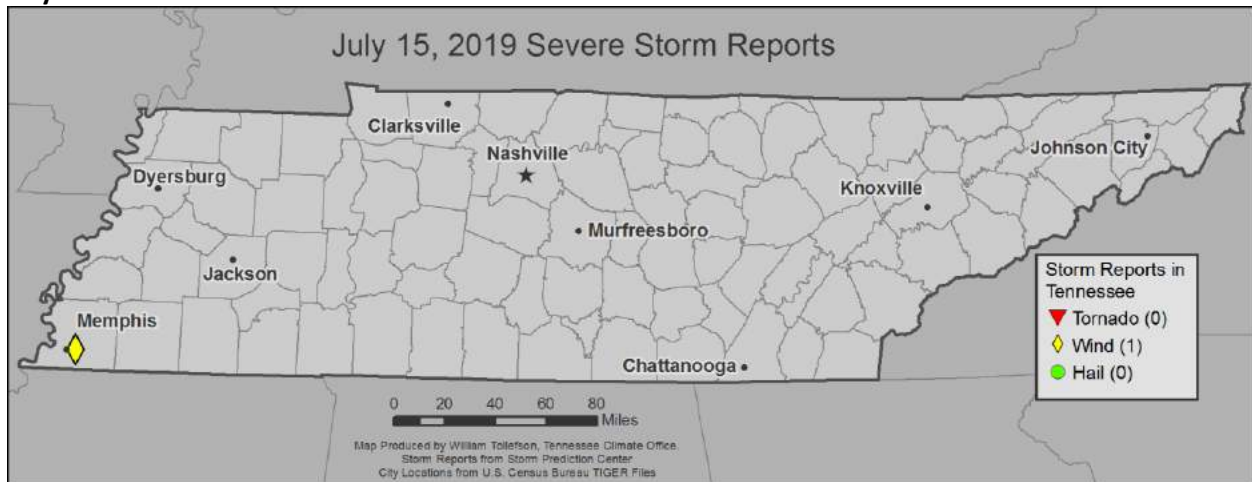
July 13:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
0:45	--	10 ESE COOKEVILLE	PUTNAM	36.1	-85.34	A FEW REPORTS OF TREES DOWN BLOCKING ROADS AND POWER OUTAGES ACROSS SOUTHEAST PUTNAM COUNTY (OHX)
1:59	--	2 W SPARTA	WHITE	35.93	-85.51	LARGE TREE BRANCHES BLOCKING JUDGE AUSTIN ROAD JUST WEST OF SPARTA. (OHX)

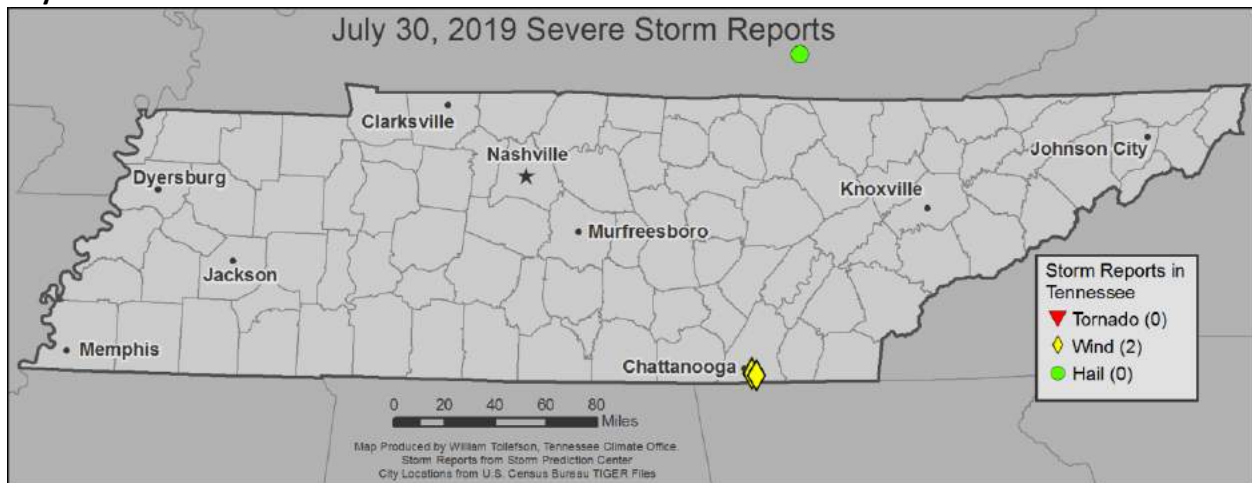
July 15:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
2:35	--	4 NNW SOUTHEAST MEMPHIS	SHELBY	35.11	-89.92	100 YEAR OLD TREE FELL AT THE BOTANICAL GARDENS IN MEMPHIS. (MEG)

July 30:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
17:56	--	4 ESE CHATTANOOGA	HAMILTON	35.04	-85.2	ROOF DAMAGE AT CHATTANOOGA AIRPORT. (MRX)
18:15	--	3 WNW EAST BRAINERD	HAMILTON	35.03	-85.17	TREE DOWN AND POWER LINES DOWN AROUND THE SKYLINE DR VICINITY. (MRX)

CPC Outlooks for the Next Month:

The Climate Prediction Center 1-month outlooks for August indicate that all of Tennessee will have equal chances of observing temperature and precipitation patterns that are below normal, normal, or above normal.

