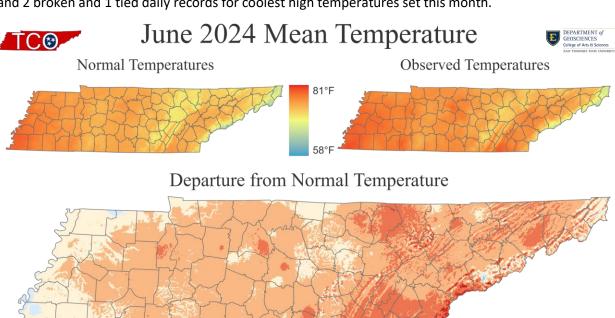
# June 2024 Tennessee State Climate Summary

Tennessee Climate Office \* East Tennessee State University
Prepared by William Tollefson and Dr. Andrew Joyner
With contributions by <u>Climate Data Representatives</u> across the state

#### Monthly Temperature Summary:

June 2024 averaged a bit warmer than normal for most areas of the state with an increasing trend from west to east, a few areas of West Tennessee were slightly cooler than normal while East Tennessee averaged 1-4°F warmer than normal. The month started out with close to normal temperatures followed by a cool spell that brought temperatures that were 2-6°F cooler than normal for the second week of the month. A persistent heat wave impacted the state for the second half of June, with temperatures averaging 3-6°F warmer than normal. The mean temperature for Chattanooga tied for the 6<sup>th</sup> warmest June in the city's 146-year weather history and the city recorded its 2<sup>nd</sup> warmest average low temperature for the month of June. The mean temperature for the Tri-Cities was the 10<sup>th</sup> warmest in the area's 77-year weather history, but the average high temperature for June was tied for the 2<sup>nd</sup> warmest in the area's history. Throughout the state, there were 11 broken and 8 tied daily high temperature records and 14 broken and 18 tied daily records for warmest low temperatures set this month. Winchester set monthly records for the highest high temperature and warmest low temperature ever recorded in the month of June. On the cool side of the record books, there were 7 broken and 2 tied daily low temperature records and 2 broken and 1 tied daily records for coolest high temperatures set this month.



Stations with the highest mean temperature

SHILOH NMP TENNESSEE

	(F)	Station Type	Station Name
Map Data from Pl	80.6	WBAN	MEMPHIS INTERNATIONAL AP
Oregon St	80.2	WBAN	CHATTANOOGA AP
1991-2020 Clim Station Data Retri	79.8	WBAN	MEMPHIS WFO
Judion Data Netri	79.5	WRAN	NASHVILLE INTL AP

RAWS

Map Data from PRISM Climate Group, Oregon State University. 1991-2020 Climate Normals Used. Station Data Retrieved From xmACIS2.

Degrees (F)

0 to +1 +1 to +2 +2 to +4

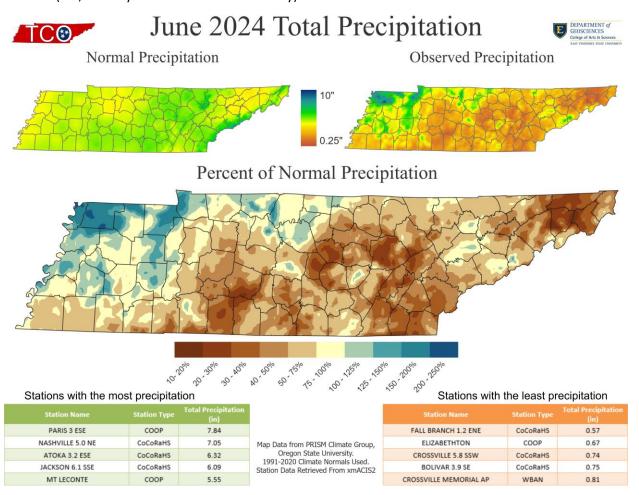
-1 to 0

#### Stations with the lowest mean temperature

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	56.1
NEWFOUND GAP	COOP	64.2
ROAN MOUNTAIN 3SW	COOP	66.5
CHEROKEE TENNESSEE	RAWS	68.9
MOUNTAIN CITY 2	COOP	69.1

#### Monthly Precipitation Summary:

Most areas of the state recorded below normal rainfall for the month of June, with the exception of some areas in West Tennessee and northern Middle Tennessee. Several areas in southern Middle Tennessee, on the Cumberland Plateau, and in East Tennessee recorded less than half of their normal June precipitation; meanwhile, a few spots in Lake and Obion counties recorded double their normal June precipitation totals. Despite the generally dry conditions, the rain that did fall came mostly from thunderstorms that produced heavy rain and even flash flooding in some parts of the state. Over the month there were 5 daily precipitation records set at stations that have at least a 30-year reporting history. The first week of the month brought the most widespread rains, with many areas of the state recording 1-inch of rain or more. Very little rain fell in the second week of June, with the exception of 1- to 3-inches of rain in the far northwestern corner of the state. Spotty storms produced heavy rain in Wilson County as well is more wide-spread heavy rains in West Tennessee in the third week of June. The month ended with more scattered storms, including heavy rains of up to 5" in the fourth week of the month for parts of Henry and Stewart counties. Of the long-term climate reporting stations, only the Tri-Cities had a top-10 driest June, recording the 10<sup>th</sup> driest June for the station's 77-year history. The Tri-Cities airport reported 1.72-inches of rain for the month with almost half of that (0.82-inches) coming on the last day of the month. While not an official long-term climate monitoring station, the Crossville Airport recorded only 0.81" of rain this month, making it the driest June in the station's 71-year history, this was also the 11th driest month in the station's history with 9 of the top-10 driest months being either September or October (i.e., it's very rare for June to be this dry).



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

Station data for airports across the state using WBAN weather stations, compared to 1991-2020 30-year climate normals for departure from mean temperature and total precipitation:

6	Temperatures (°F)								Precipitation (inches		
Station Name		Av	erages			Extr	emes		Totals		
Name	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
Memphis	89.8	71.4	80.6	+0.7	98	6/24	62	6/10	2.71	-1.28	68%
Jackson	89.8	68.3	79.1	+2.7	98	6/25	55	6/12	3.85	-0.91	81%
Clarksville	87.6	65.9	76.8	+1.8	95	6/25	51	6/12	2.84	-0.81	78%
Nashville	90.4	68.6	79.5	+2.4	98	6/25	57	6/12	2.58	-1.78	59%
Chattanooga	90.7	69.6	80.2	+2.8	100	6/26	60	6/8	1.26	-2.92	30%
Crossville	83.0	61.9	72.4	+2.2	92	6/26	50	6/12	0.81	-4.12	16%
Knoxville	87.5	66.7	77.1	+1.8	95	6/26	56	6/1	4.54	+0.30	107%
Bristol	87.3	61.7	74.5	+2.2	96	6/26	47	6/1	1.72	-2.20	44%

Departures and %Norm Key: Warmer than Normal, Cooler than Normal; Wetter than Normal, Drier than Normal

#### **Hottest Stations (highest maximum temperature)**

Hottest Stations (highest maximum temperature)								
Station Name	Station Type	Highest Temperature (F)	Date					
WINCHESTER 5SE	СООР	104	24					
SHILOH NMP TENNESSEE	RAWS	102	25					
CHATTANOOGA AP	WBAN	100	26					
MEMPHIS WFO	WBAN	99	26					
MERIWETHER LEWIS TENNESSEE	RAWS	99	25					
MEMPHIS INTERNATIONAL AP	WBAN	98	24					
COLUMBIA 3 WNW	СООР	98	17					
JACKSON MCKELLAR- SIPES AP	WBAN	98	25					
LEBANON 7 N	СООР	98	24					
CLARKSVILLE WWTP	СООР	98	25					
NASHVILLE INTL AP	WBAN	98	25					
NASHVILLE BERRY FIELD	СООР	98	26					
CAMDEN TOWER TENNESSEE	RAWS	98	25					

Eight stations tied for the  $6^{th}$  hottest temperature (98°F)

**Coldest Stations (lowest minimum temperature)** 

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	38	11
SPARTA WASTEWATER PLANT	COOP	42	1
MOUNTAIN CITY 2	COOP	43	2
NEWFOUND GAP	COOP	44	1
CHEROKEE TENNESSEE	RAWS	45	1
KINGSTON SPRINGS	COOP	46	13
ROAN MOUNTAIN 3SW	COOP	46	1
ERWIN 1 W	COOP	47	1
BRISTOL AP	WBAN	47	1
ELIZABETHTON	COOP	47	1
GATLINBURG 2 SW	COOP	47	2
SPRINGFIELD EXPERIMENT STATION	СООР	47	6

Five stations tied for the 8<sup>th</sup> coldest temperature (47°F)

## Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	80.6
CHATTANOOGA AP	WBAN	80.2
MEMPHIS WFO	WBAN	79.8
NASHVILLE INTL AP	WBAN	79.5
SHILOH NMP TENNESSEE	RAWS	79.3
JACKSON MCKELLAR- SIPES AP	WBAN	79.1
NASHVILLE BERRY FIELD	СООР	78.9
DYERSBURG MUNICIPAL AIRPORT	WBAN	78.1
CLARKSVILLE WWTP	СООР	77.9
SHELBYVILLE WATER DEPT	СООР	77.9

# **Coolest Stations (lowest mean temperatures)**

coolest stations (rottest incan temperatures)								
Station Name	Station Type	Mean Temperature (F)						
MT LECONTE	СООР	56.1						
NEWFOUND GAP	СООР	64.2						
ROAN MOUNTAIN 3SW	СООР	66.5						
CHEROKEE TENNESSEE	RAWS	68.9						
MOUNTAIN CITY 2	СООР	69.1						
GATLINBURG 2 SW	СООР	69.3						
CROSSVILLE 7 NW	WBAN	69.8						
TOWNSEND 5S	СООР	70.8						
ERWIN 1 W	COOP	71.4						
KINGSTON SPRINGS	COOP	71.5						

# Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
PARIS 3 ESE	СООР	7.84
NASHVILLE 5.0 NE	CoCoRaHS	7.05
ATOKA 3.2 ESE	CoCoRaHS	6.32
JACKSON 6.1 SSE	CoCoRaHS	6.09
MT LECONTE	СООР	5.55
HOLLOW ROCK 0.6 NNW	CoCoRaHS	5.48
CLARKSVILLE 4.9 NW	CoCoRaHS	5.26
MOUNT JULIET 5.2 SSW	CoCoRaHS	5.15
HENDERSON 2.2 SSE	CoCoRaHS	5.12
MCKENZIE 1.5 SSE	CoCoRaHS	5.05

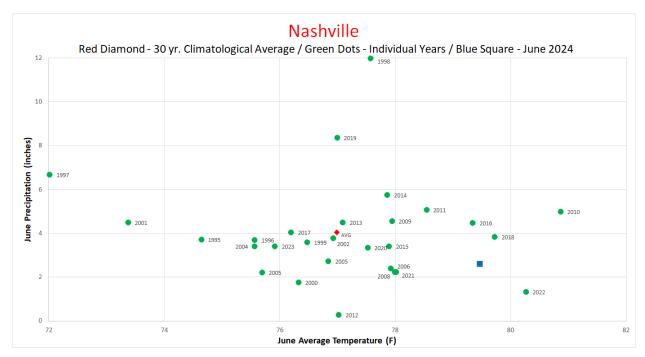
# **Driest Stations (lowest precipitation totals):**

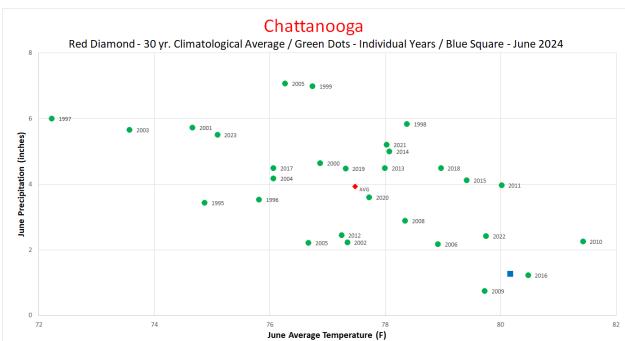
Briese stations (lowest precipitation totals).								
Station Name	Station Type	Total Precipitation (in)						
FALL BRANCH 1.2 ENE	CoCoRaHS	0.57						
ELIZABETHTON	СООР	0.67						
CROSSVILLE 5.8 SSW	CoCoRaHS	0.74						
BOLIVAR 3.9 SE	CoCoRaHS	0.75						
CROSSVILLE MEMORIAL AP	WBAN	0.81						
GRAY 1.5 E	CoCoRaHS	0.88						
GRAY 1.3 S	CoCoRaHS	0.89						
CROSSVILLE 2.3 SE	CoCoRaHS	0.96						
DOWELLTOWN 5.8 NE	CoCoRaHS	0.98						
PIKEVILLE 5.7 SSE	CoCoRaHS	1.03						

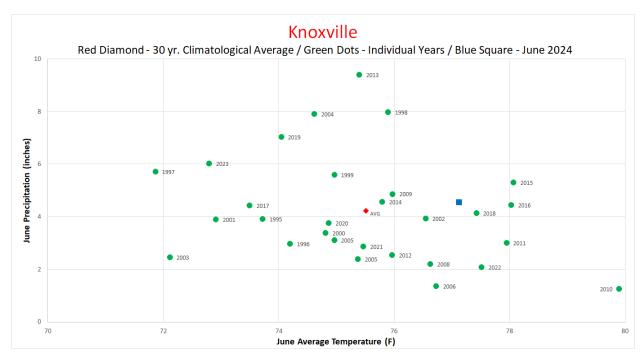
#### The Month in Comparison:

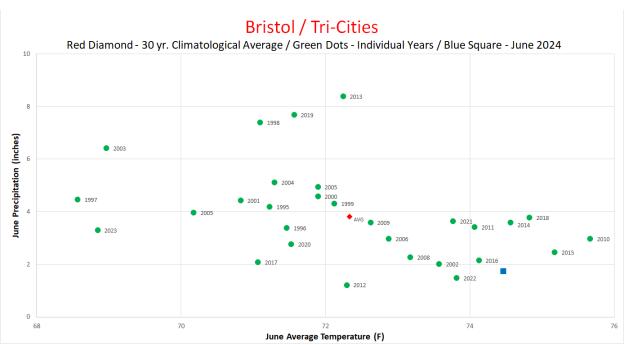
Comparing the total precipitation and mean temperature of this June to the conditions of June over the past thirty years at select airport weather stations across the state, it was warmer than average at all six stations and drier than average for all stations except Knoxville. This June was the 3<sup>rd</sup> warmest for Chattanooga and 5<sup>th</sup> warmest for Bristol/Tri-Cities of the past thirty years. It was also the 3<sup>rd</sup> warmest for Chattanooga and Bristol/Tri-Cities, 4<sup>th</sup> warmest Nashville, and 5<sup>th</sup> warmest for Jackson compared to the past thirty years. Looking at the longer-term records for mean temperatures, Chattanooga tied the record for 6<sup>th</sup> warmest June in the city's 146-year weather history, Jackson tied for 7<sup>th</sup> warmest June in the station's 74-year weather history, and Bristol/Tri-Cities had the 10<sup>th</sup> warmest June in the city's 77-year weather history. Only the Tri-Cities had a top 10 driest month, with this June being the 10<sup>th</sup> driest.





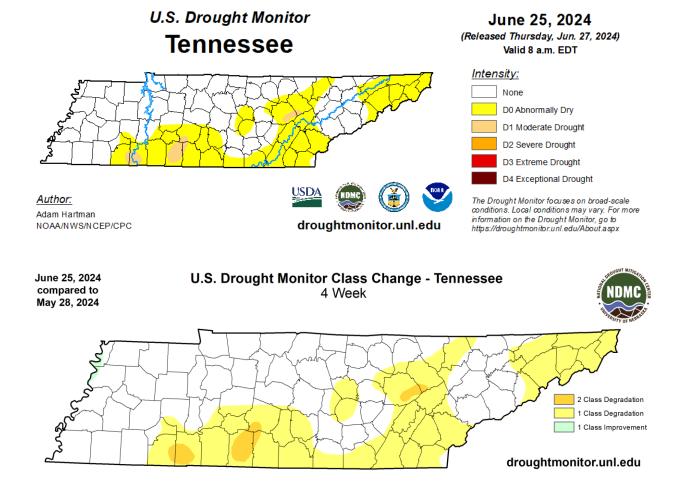






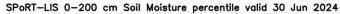
#### **Drought Monitor:**

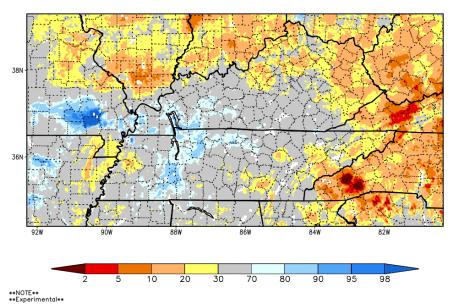
In the last US Drought Monitor release in May there was a small area of Abnormally Dry (D0) conditions in the northwestern corner of Tennessee, but that was removed in the June 4<sup>th</sup> edition of the Drought Monitor. Tennessee was clear of all drought and abnormally dry conditions for two weeks in the middle of June, but then areas of Abnormally Dry and Moderate Drought (D1) conditions emerged in southern and eastern parts of the state in the second half of the month. This was caused by consistently below normal rainfall and warmer than normal temperatures leading to the development of a potential flash drought. The NOAA Climate Prediction Center monthly drought outlook suggests that further drought development is likely across most of Tennessee in July as the warmer than normal conditions will likely persist, and it is unlikely that we will have wetter than normal conditions in the next month.



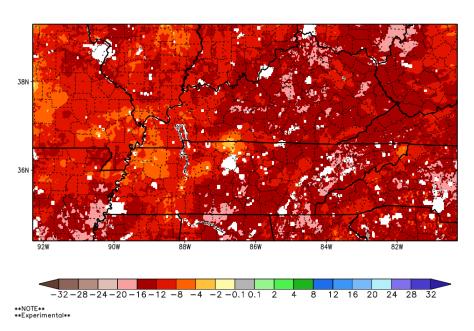
#### Soil Moisture:

The NASA SPORT Land Information System showed most areas of Tennessee with soil moisture levels in the normal percentile range, with below normal soil moisture in some areas of East Tennessee, and a few spotty locations in West Tennessee, and southern Middle Tennessee. Areas along the western bend of the Tennessee River and in northern Middle Tennessee were shown with above normal soil moisture percentiles due to heavy thunderstorm rains in the later parts of June. Over the entire state, soil moisture levels dropped by 4 to 20 percentile points over June as there was consistently below normal rainfall for most areas and warmer than normal conditions, especially in the second half of the month. At the end of June, the USDA rated topsoil moisture 9% very short, 26% short, 60% adequate, and 5% surplus. Subsoil moisture was rated 7% very short, 23% short, 66% adequate, and 4% surplus.



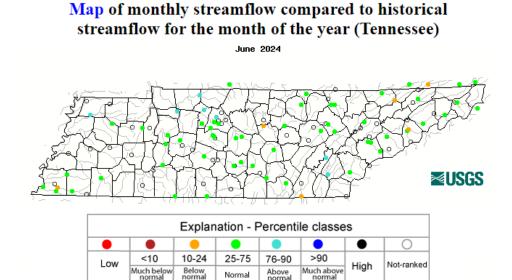


1-Month Difference in Column Relative Soil Moisture (%) valid 12z 30 Jun 2024



#### Streamflow:

Averaged for the whole month most streams in Tennessee reported normal or above normal streamflow levels, however this was mostly due to high flow in the beginning of the month after above normal rains in May. By the end of June only one stream was still reporting above normal streamflow while the others were mostly mixed between normal and below normal.

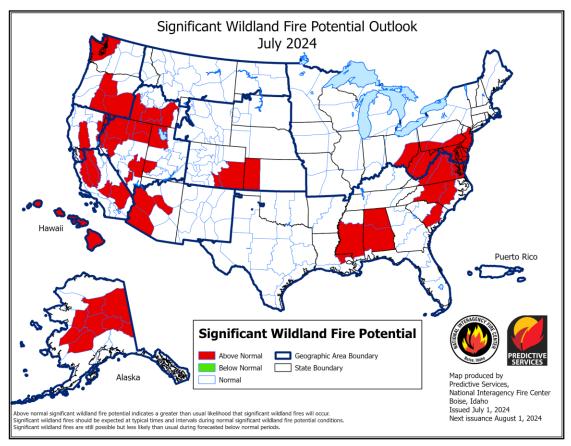


#### Miscellaneous:

**Crop Conditions from USDA:** Dry weather in the earlier parts of June were welcome for most ag producers, as it allowed for hay cutting and winter wheat harvests and later planting that had been delayed by frequent rains in May. However, by the end of June some crops were starting to show signs of stress from the dry conditions, mostly corn and late planted soybeans, pastures are also drying out and prospects for a good second cutting for hay are in question due to the rapid drying brought on by hot and dry conditions in the second half of June. However, most crops remain in good to excellent condition across the state.

CROP PROGRESS							COND	ITION		
Item	This Week	Last Week	2023	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
	Percent						Pero	cent		
Corn – Silking	53	34	42	37	Corn	3	6	26	50	15
Corn – Dough	3	-	3	3	Cotton	3	7	28	55	7
Cotton - Planted	100	99	100	100	Soybeans	2	5	22	57	14
Cotton - Squaring	55	40	49	41	Pasture	2	8	39	45	6
Cotton - Setting Bolls	9	2	12	6	Tobacco	4	4	18	54	20
Soybeans – Planted	95	90	96	95	Hay	1	5	30	55	9
Soybeans – Emerged	87	78	89	86						
Soybeans – Blooming	41	27	35	19						
Soybeans - Setting Pods	5	-	6	2						
Tobacco – Transplanted	91	84	93	93						
Tobacco – Topped	1	-	-	-						
Winter Wheat - Harvested	93	78	83	88						
Hay – 1 <sup>st</sup> Cutting	95	88	93	-						

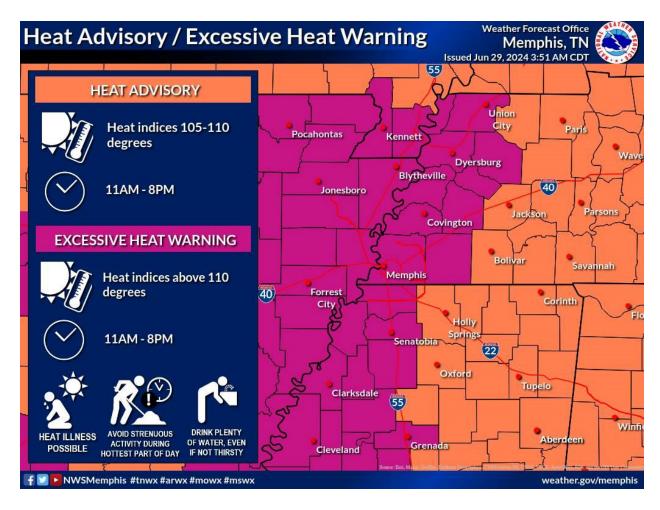
**Fire Danger**: The Interagency Fire Center's significant wildland fire potential outlook for July shows all of Tennessee with normal potential for the next month. However, some surrounding areas are showing an above normal potential. Rising relative humidity will likely help prevent large fires in Tennessee this summer, but with short-term drought emerging, grass and brush fires could be possible.



#### Story of the Month:

The major weather and climate stories for June 2024 were the high heat and dry conditions that impacted the state for the second half of the month, with the potential for an emerging flash drought (also known as a rapid onset drought). After a very wet May, drier conditions started for parts of the state in June, with decreasing rain amounts in the middle and end of the month. Many areas of West Tennessee and northern Middle Tennessee benefited from rain and storms during the month and ended up with above normal precipitation totals, although most rain came with high intensity and led to some flash flooding. Southern Middle Tennessee and most of East Tennessee recorded below normal rainfall, with a few areas recording less than 20% of their normal June precipitation.

June started off with close to normal temperatures and even had a solid cold spell in the second week of the month with temperatures falling into the low 50's or 40's in most areas. However, in the second half of the month a persistent heat wave moved from the central US to the east, with above normal temperatures in the third and fourth week of the month. The first Excessive Heat Warning of the year issued in Tennessee was issued for Shelby County on June 25. Several other counties in West TN were also under Excessive Heat Warnings on June 29<sup>th</sup> and Heat Advisories spread across the state.



On June 26, the Chattanooga airport weather station recorded a high temperature of 100°F, the first 100-degree day for Chattanooga since October 3, 2019, and the first 100-degree day in June since 2012. On the same day, the Tri-Cities airport reached a high of 96°F, their hottest temperature since September 13, 2019, and the highest June temperature since 2012. The text below from a National Weather Service Morristown Facebook post describes these temperatures as well as the lack of rainfall in the cities.

Yesterday, Chattanooga recorded a high of 100° with a high of 96° in the Tri-Cities. For Chattanooga, this was the highest temperature on any day since October of 2019 and the highest in June since 2012. For the Tri-Cities, this was the highest temperature on any day since September of 2019 and the highest in June since 2012. Both sites are also significantly below on rainfall as well. Unless Chattanooga picks up well over 1" in the next couple of days, this June will be the driest since 2016. Depending on how much rain falls over the weekend, the Tri-Cities could record the driest since 2012 or earlier. #tnwx #ncwx #vawx #mrxwx

The combination of high temperatures and low precipitation led to rapidly emerging dry conditions and has possibly set the stage for a flash drought with grasses and other ornamental plants yellowing and showing other signs of stress if they were not irrigated. Hay fields and pastures are the key concern for potential drought impacts heading later into summer, with corn being the next highest concern if widespread rains do not return.

# **Storm Reports:**

\*Storm Reports are based on filtered NOAA Storm Prediction Center data or local NWS storm reports. Future quality control checks may change the official record of severe events, please see spc.noaa.gov for any updates.

During the month of June 2024 there were 8 days with severe storm reports, totaling 0 tornado reports, 29 reports of severe winds/severe wind damage, and 1 report of severe hail (1" or larger).

June 3



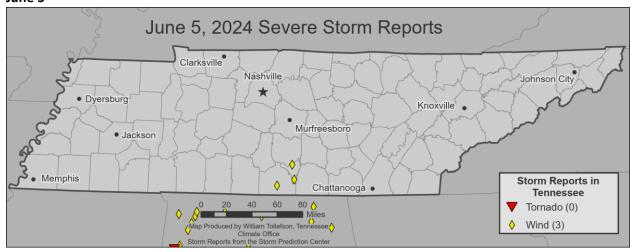
#### Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
22:23		Inglewood	Davidson	36.21	-86.73	Approximately 20 large trees down some of which brought down power lines and blocked streets in the Inglewood neighborhood of Nashville. (OHX)

#### Hail:

Time (UTC)	Size (in)	Location	Count y	Lat	Lon	Comments
20:36	1.00	1 NNW Union City	Obion	36.43	-89.06	(MEG)

June 5



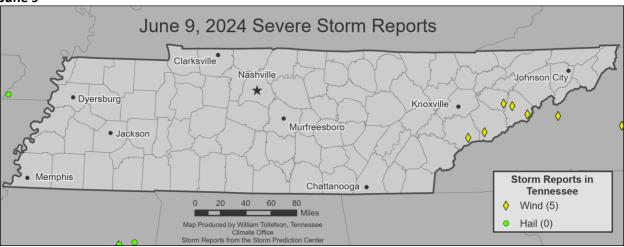
Time	Speed	Location	County	Lat	Lon	Comments
(UTC)	(mph)		,			
2:23		4 SSW Fayetteville	Lincoln	35.1	-86.58	A tree was knocked down blocking both lanes of the road at 107 Wells Hill Road. Time estimated by radar. (HUN)
2:38		8 S Lynchburg	Moore	35.17	-86.34	Tree down across road. (HUN)
2:50		4 NNW Lynchburg	Moore	35.34	-86.37	Tree down across road. (HUN)





Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
6:03	60	Dyersbur g	Dyer	36.04	-89.37	(MEG)
7:00		Mckenzie	Carroll	36.14	-88.51	Tree down in town. (MEG)

June 9



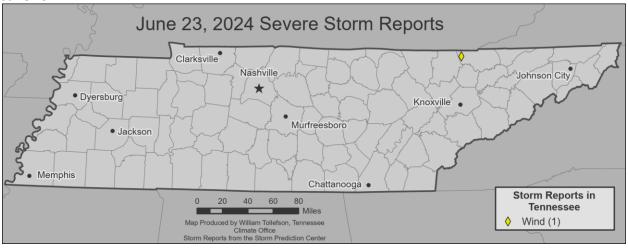
Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
21:55		4 NNE Chestnut Hill	Jefferson	35.99	-83.31	Corrects previous tstm wnd dmg report from 4 NNE Chestnut Hill. Multiple trees and powerlines down at the intersection of Indian Creek Rd and Upper Rinehart Rd. Time ap (MRX)
22:03		Newport	Cocke	35.96	-83.19	Multiple trees and powerlines down. (MRX)
22:10		1 NW Cades Cove	Blount	35.61	-83.82	Multiple trees down at GSMNP 4 miles from entrance of Cades Cove relayed from NWS Employee providing on-site decision support services. Location and timing approximate. (MRX)
22:15		1 NNW Elkmont	Sevier	35.67	-83.59	Multiple trees down at GSMNP relayed from NWS Employee providing on-site decision support services. Location and timing approximate. (MRX)
22:25		2 NNW Round Mountain	Cocke	35.86	-82.98	Trees and powerlines down along Round Mountain Rd. Time approximate. (MRX)

June 16



Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
20:25		1 W Madison	Davidson	36.26	-86.73	Tspotter and Facebook photos showed several trees tree limbs and power lines down in the north Inglewood and Madison areas including on W Marathona Rd  Brush Hi (OHX)
23:12		Brentwood	Williamson	36	-86.79	Tspotter photos of a tree and a few tree limbs plus a power line down in Brentwood and Crieve Hall areas. (OHX)

June 23



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
0:18		3 SE Clairfield	Claiborne	36.52	-83.92	Few trees down. (MRX)

June 26



Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
21:20		2 ENE Spring Hill	Williamson	35.75	-86.89	Tree down on Pipkin Hills Dr. (OHX)
21:25		4 SSW Petersburg	Lincoln	35.26	-86.67	A frail looking tree was knocked down on Smokey Circle. Time estimated by radar. (HUN)
21:31		1 WNW Murfreesboro	Rutherford	35.86	-86.4	tSpotter report of a downed powerline on Broad Street and Medical Center Parkway. Time estimated by radar. (OHX)
21:35		Franklin	Williamson	35.93	-86.84	Many reports of trees down across Franklin with some blocking roadways. (OHX)
21:52		4 N Antioch	Davidson	36.12	-86.68	Social media report of a downed tree in Crieve Hall. Time estimated via radar. (OHX)
21:55		8 SSW Unionville	Bedford	35.51	-86.63	Large tree down on Sim Springs Road in Wheel. (OHX)
22:08		1 ESE Hermitage	Davidson	36.2	-86.61	tSpotter report of a tree and powerline down at Andrew Jackson and Weber Drive in Hermitage. Power outages reported. Time estimated via radar. (OHX)
22:11		Watertown	Wilson	36.1	-86.13	Tree reported down in Watertown on Highway 70. Time estimated from radar. (OHX)
22:13		2 SSW Green Hill	Wilson	36.21	-86.58	Facebook report of tree snapped on Garland Drive. (OHX)
22:19		3 NE Coopertown	Robertson	36.48	-86.94	Tree down in the 4100 block of Lahr Road in Springfield. Time estimated. (OHX)

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
22:32		6 NNW	Wilson	36.3	-86.36	Facebook photo of a tree down on a
22.32		Lebanon	VVIISOIT	30.3	-00.50	house on Denny Road. (OHX)
						Powerline down across the road on
0:00		Cookeville	Putnam	36.16	-85.51	West Spring Street at Scott Avenue in
						Cookeville. Time estimated. (OHX)
						Delayed report. Facebook photos of
1:15		Jamestown	Fentress	36.43	-84.93	an awning blown off gas station in
						Jamestown. (OHX)

## June 30



vviiia.						
Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
22:13		Talbott	Jefferson	36.15	-83.42	One tree down. Reported by Dispatch. Time and location estimated from radar. (MRX)
22:30		4 E Newport	Cocke	35.95	-83.12	Tree Down in Bridgeport Community. Time estimated by radar. (MRX)

#### CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center outlooks for July show all of Tennessee will likely experience warmer than normal conditions with higher confidence along the southern and eastern borders of the state. All of Tennessee is shown with equal chances for above normal, below normal, or near normal precipitation, with the Gulf and Atlantic coasts leaning towards a wetter than normal pattern while the south-central US is leaning towards a drier than normal pattern.

