

September 2022 Tennessee State Climate Summary

Tennessee Climate Office * East Tennessee State University

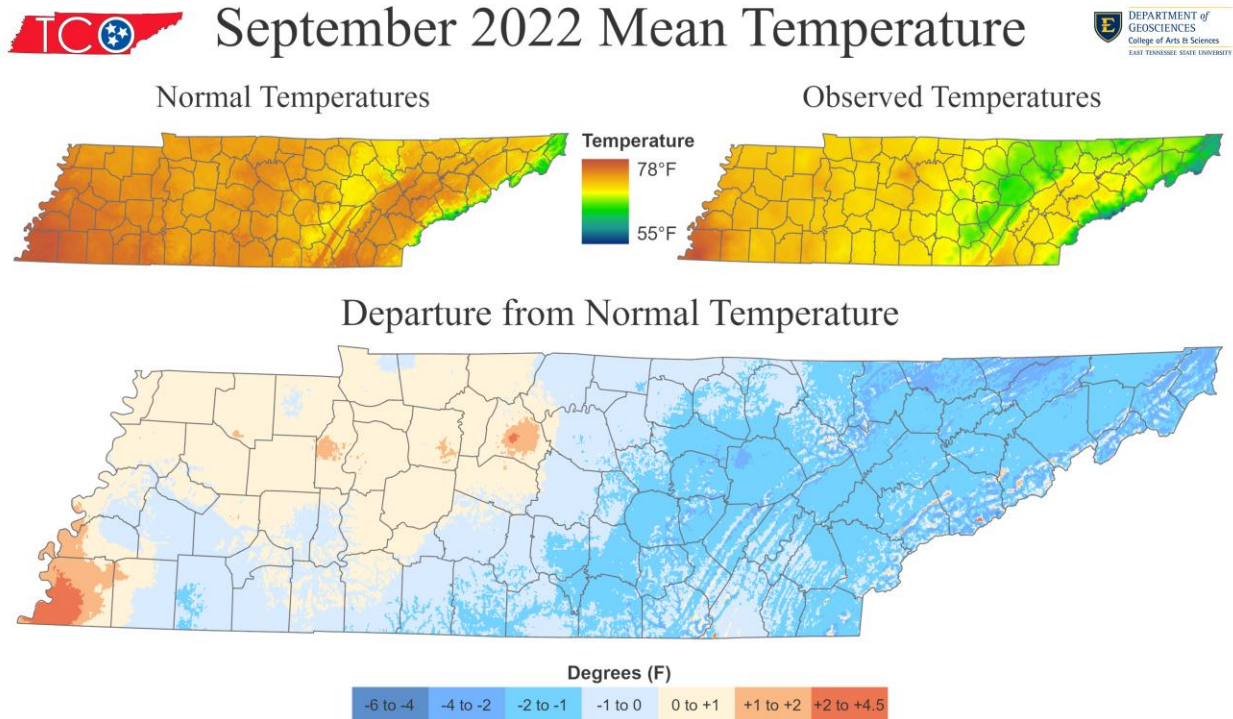
Prepared by William Tollefson and Dr. Andrew Joyner

With contributions by [Climate Data Representatives](#) across the state

Monthly Temperature Summary:

September 2022 was cooler than normal across East Tennessee and most southern portions of the state; however, it was warmer than normal in northern Middle and West Tennessee and in the Memphis area. The month started out warm, followed by a considerable cool down in the second week of September, which brought temperatures across the state to below normal for this time of the year. The third week of the month had temperatures rising to record levels in West and Middle Tennessee. Then the month ended cooler than normal after a strong cold front swept the state for the first day of Fall on September 22.

At weather stations with at least a 30-year reporting history, there were 18 records set for daily high temperatures this month. This included the high temperatures of 102°F at the Memphis Airport and 100°F at the Nashville Airport on September 21. This was the latest calendar date either city has broken the 100°F mark! Mount LeConte, in the Smoky Mountains, also set its record for the warmest temperature ever recorded in September on September 11, with a high of 77°F. Additionally, there were 5 daily records set for the warmest low temperature this month. On the cool side, there were 9 records set for lowest daily minimum temperature, and 4 records set for coolest daily high temperature this month.



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	77.7
MEMPHIS WFO	WBAN	74
NASHVILLE INTL AP	WBAN	73.4
NASHVILLE BERRY FIELD	COOP	73.1
CHATTANOOGA AP	WBAN	73.1

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

Stations with the lowest mean temperature

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	52.3
NEWFOUND GAP	COOP	59.1
ROAN MOUNTAIN 3SW	COOP	60.2
MOUNTAIN CITY 2	COOP	62.5
CHEROKEE TENNESSEE	RAWS	63.1

Monthly Precipitation Summary:

September started out wet for many areas of the state, especially in Middle and East Tennessee where rainfall totals of 2-inches or more were common in the first week of the month. In the first few days of the month, there 19 daily rainfall records set at weather stations with at least a 30-year reporting history, and 5 of those records were at stations with over a 100-year reporting history. Two weather stations set records for the most precipitation in 24 hours for the month of September. The Columbia 3WNW, COOP station in Maury County reported a total of 5.5-inches of rain on Sep. 2, breaking the previous daily record by 4.05-inches! This also set the monthly record for a 24-hr rainfall total in September for the station, beating the previous record of 5.4-inches from 1979. The Pikeville COOP station in Bledsoe County also set a monthly 24-hr rainfall record for September with 5.02" of rain recorded on Sep 4, 2022, beating the old record of 4.65-inches from 2004.

The second week of the month brought drier conditions to most areas of the state, although a few counties did record another 2-inches of rain, mostly in eastern Middle Tennessee and the northern Cumberland Plateau. The second half of the month brought very dry conditions with less than 1-inch of rain recorded for most areas of the state. Extreme northeast Tennessee received rains from the remnants of Hurricane Ian, but it was limited to 0.5-1.5 inches of rainfall.

Many portions of West and Middle Tennessee reported less than half of their normal monthly rainfall totals for September, and several weather stations reported less than 1-inch of rainfall for the month, which led to large expansions in Abnormally Dry conditions in these areas on the U.S. Drought Monitor.

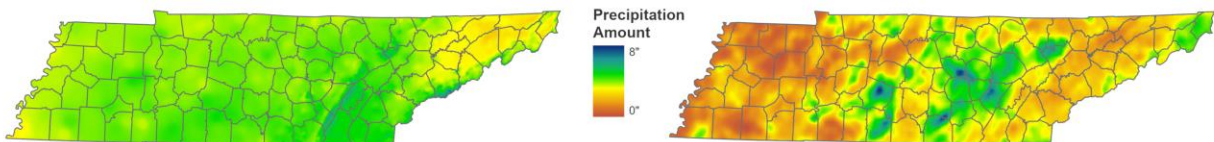


September 2022 Total Precipitation

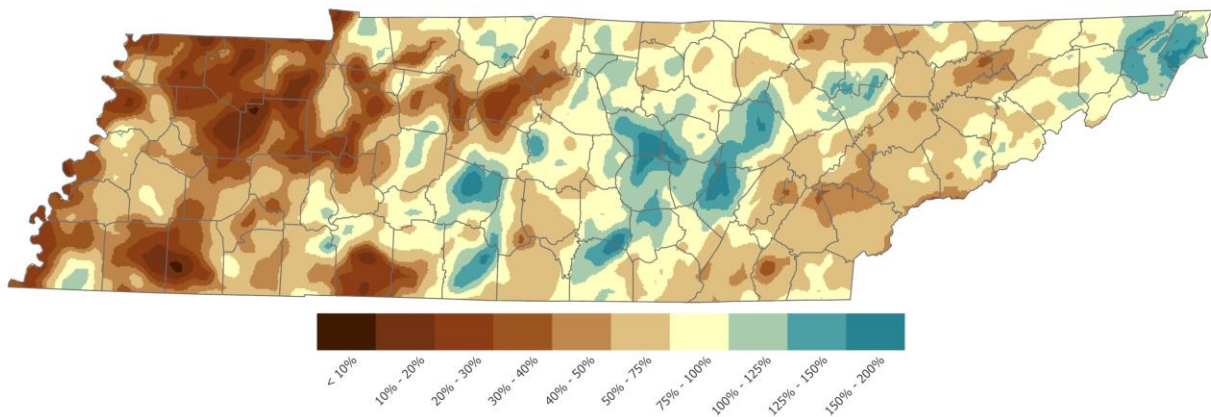


Normal Precipitation

Observed Precipitation



Percent of Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
LEBANON 2.7 SSE	CoCoRaHS	7.82
COLUMBIA 3 WNW	COOP	7.15
LEWISBURG 5.1 SW	CoCoRaHS	7.1
CROSSVILLE 4.7 S	CoCoRaHS	6.87
CLARKRANGE 6.0 NE	CoCoRaHS	6.78

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
DRESDEN	COOP	0.15
ATWOOD 0.8 WSW	CoCoRaHS	0.46
HOLLADAY 4.4 NNE	CoCoRaHS	0.55
WAYNESBORO 4.7 WSW	CoCoRaHS	0.55
MILAN EXP STN	COOP	0.57

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

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:

Station Name	Temperatures (°F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
Memphis	88.8	66.7	77.7	+1.7	102	9/21	51	9/30	2.24	-0.79	74%
Jackson	84.1	57.0	70.5	-1.2	97	9/21	41	9/30	1.52	-2.06	42%
Clarksville	83.9	58.8	71.3	+0.7	99	9/20	42	9/27	2.13	-1.34	61%
Nashville	85.0	61.7	73.4	+0.3	100	9/21	44	9/27	1.43	-2.37	38%
Chattanooga	83.4	62.7	73.1	-0.8	94	9/21	46	9/28	3.08	-1.15	73%
Crossville	75.6	54.8	65.2	-1.8	87	9/21	38	9/28	3.72	-0.42	90%
Knoxville	81.4	59.6	70.5	-1.3	92	9/21	42	9/28	2.46	-1.03	70%
Bristol	79.5	55.6	67.5	-1.1	90	9/21	40	9/29	2.95	+0.11	104%

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

Hottest Stations (highest maximum temperature)

Station Name	Station Type	Highest Temperature (F)	Date
MEMPHIS INTERNATIONAL AP	WBAN	102	21
MOUSETAIL LANDING STATE PARK	COOP	101	21
CAMDEN TOWER TENNESSEE	RAWS	101	21
SHILOH NMP TENNESSEE	RAWS	101	21
NASHVILLE BERRY FIELD	COOP	100	22
NASHVILLE INTL AP	WBAN	100	21
AMES PLANTATION	COOP	99	22
MILAN EXP STN	COOP	99	22
CLARKSVILLE NO.2	COOP	99	22
CAMDEN	COOP	99	22
CHEATHAM LOCK & DAM	COOP	99	22
SHELBY BOTTOMS NATURE CENTER	COOP	99	21
CLARKSVILLE OUTLAW AP	WBAN	99	20
MEMPHIS WFO	WBAN	99	22

Eight stations tied for the 7th hottest temperature (99°F)

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	29	30
ROAN MOUNTAIN 3SW	COOP	31	29
MILAN EXP STN	COOP	32	30
MOUNTAIN CITY 2	COOP	33	29
ONEIDA	COOP	33	29
COALMONT	COOP	33	29
SPARTA WASTEWATER PLANT	COOP	34	29
GREENEVILLE EXP STA	COOP	35	29
NEWFOUND GAP	COOP	35	29
PICKETT STATE PARK	COOP	35	28
BIG SOUTH TENNESSEE	RAWS	35	28
COKER CREEK TENNESSEE	RAWS	35	29
CROSSVILLE AREA OFFICE TENNESS	RAWS	35	28

Six stations tied for the 8th coldest temperature (35°F)

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	77.7
MEMPHIS WFO	WBAN	74
NASHVILLE INTL AP	WBAN	73.4
NASHVILLE BERRY FIELD	COOP	73.1
CHATTANOOGA AP	WBAN	73.1
SHILOH NMP TENNESSEE	RAWS	73
CAMDEN TOWER TENNESSEE	RAWS	72.9
BROWNSVILLE	COOP	72.8
AMES PLANTATION	COOP	72.6
MOUNT PLEASANT 1N	COOP	72.6

Cooltest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	52.3
NEWFOUND GAP	COOP	59.1
ROAN MOUNTAIN 3SW	COOP	60.2
MOUNTAIN CITY 2	COOP	62.5
CHEROKEE TENNESSEE	RAWS	63.1
CROSSVILLE 7 NW	WBAN	64.1
CROSSVILLE EXP STN	COOP	64.2
GATLINBURG 2 SW	COOP	64.3
COALMONT	COOP	64.7
ONEIDA	COOP	64.8

Wettest Stations (highest precipitation totals):

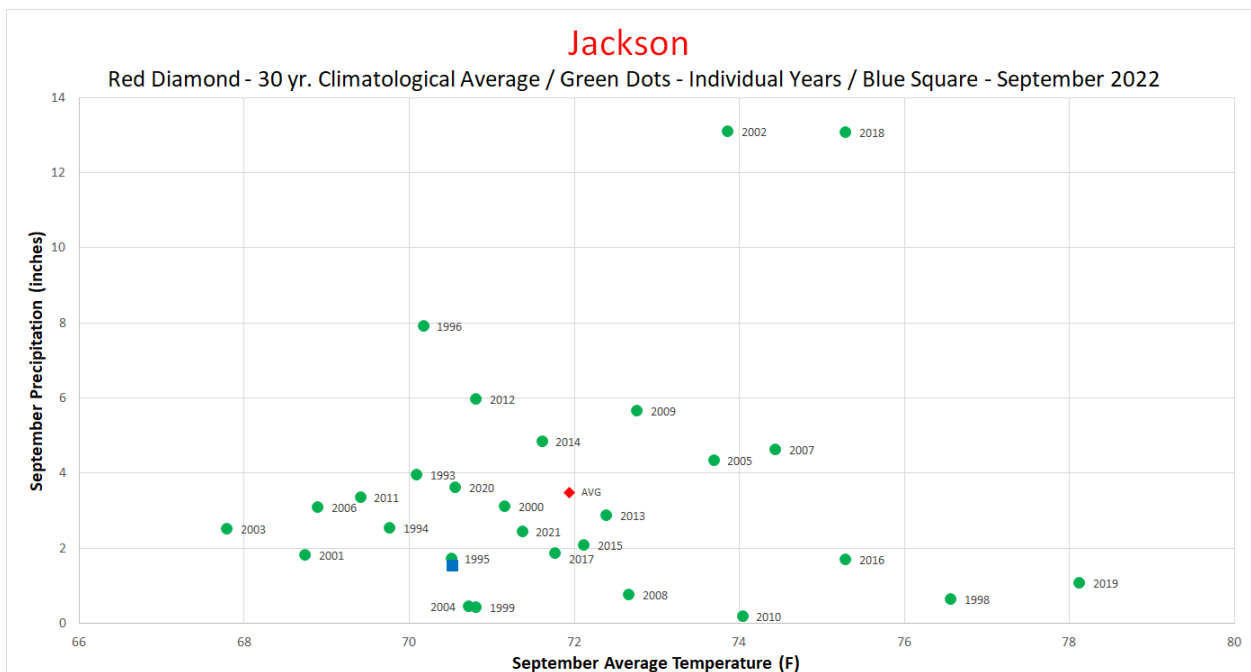
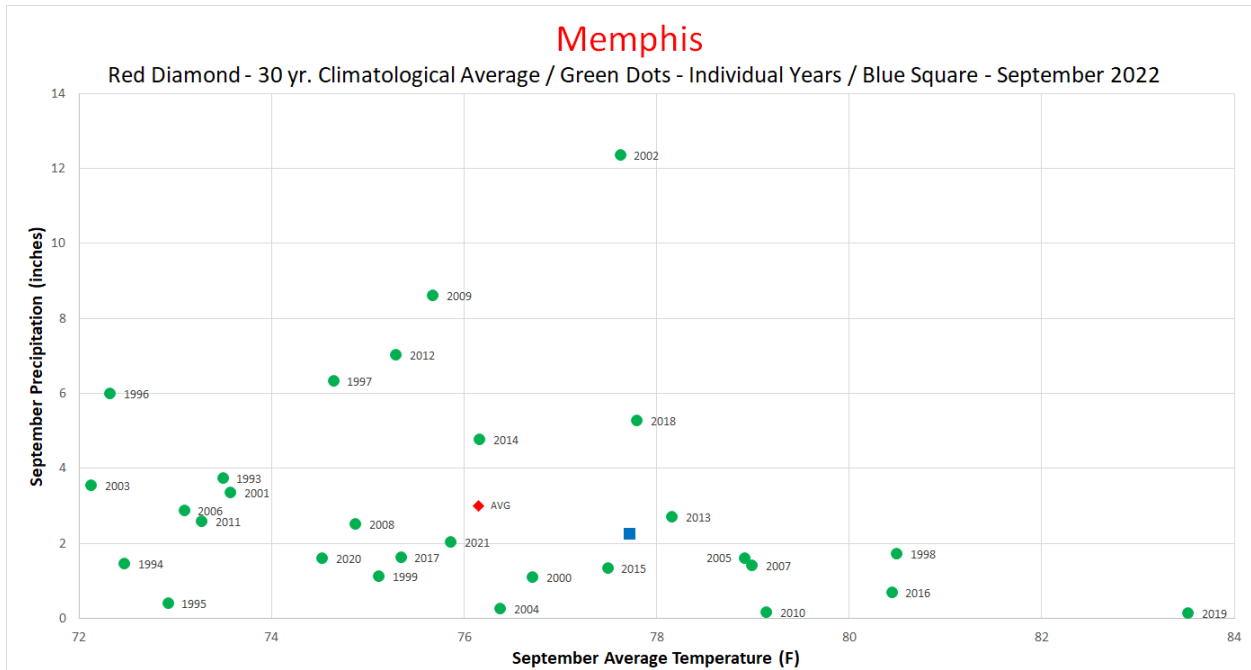
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LEBANON 2.7 SSE	CoCoRaHS	7.82
COLUMBIA 3 WNW	COOP	7.15
LEWISBURG 5.1 SW	CoCoRaHS	7.1
CROSSVILLE 4.7 S	CoCoRaHS	6.87
CLARKRANGE 6.0 NE	CoCoRaHS	6.78
TULLAHOMA 4NE	COOP	6.5
PIKEVILLE	COOP	6.32
PIKEVILLE 8.2 WSW	CoCoRaHS	6.27
GREENBRIER 1.3 ESE	CoCoRaHS	6.27
MT LECONTE	COOP	6.12

Driest Stations (lowest precipitation totals):

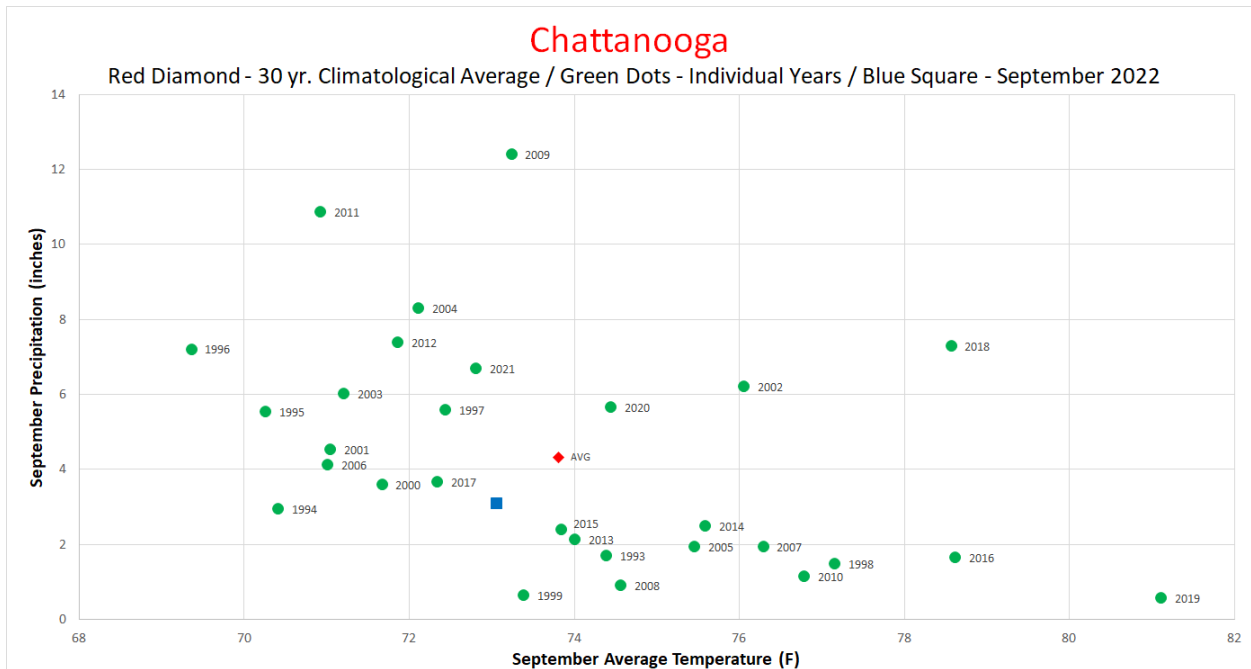
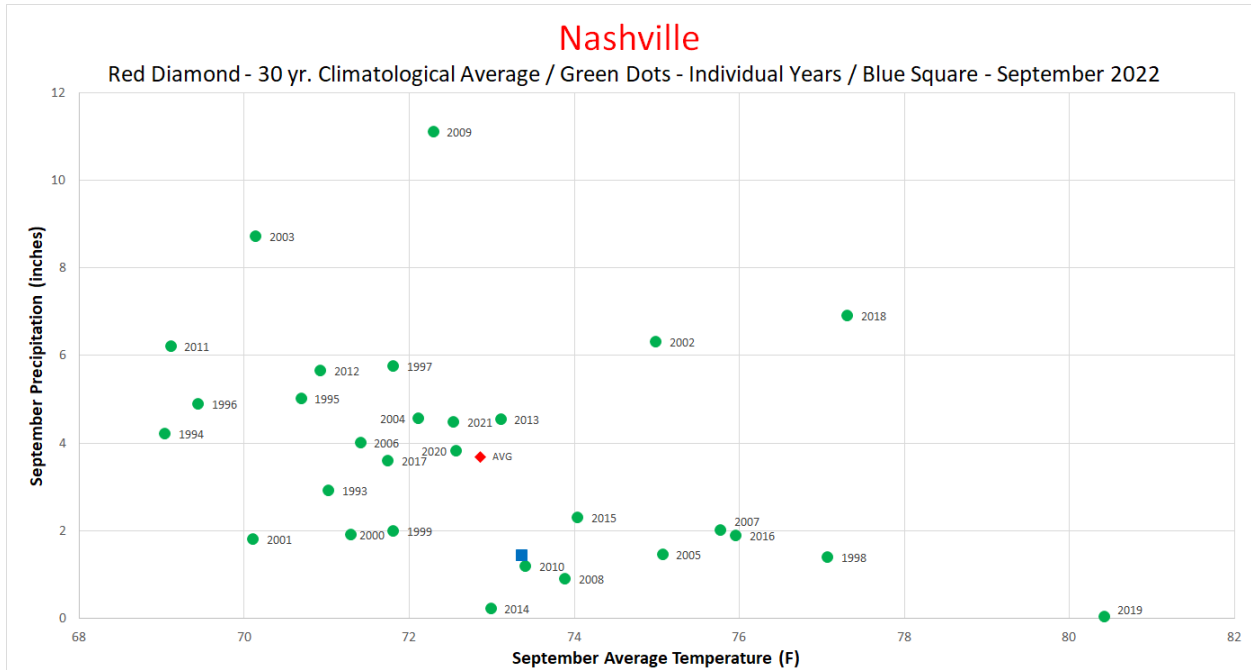
Station Name	Station Type	Total Precipitation (in)
DRESDEN	COOP	0.15
ATWOOD 0.8 WSW	CoCoRaHS	0.46
HOLLADAY 4.4 NNE	CoCoRaHS	0.55
WAYNESBORO 4.7 WSW	CoCoRaHS	0.55
MILAN EXP STN	COOP	0.57
CHEATHAM LOCK & DAM	COOP	0.58
MCKENZIE 1.5 SSE	CoCoRaHS	0.61
SHELBY BOTTOMS NATURE CENTER	COOP	0.71
GREEN HILL 3.1 NNE	CoCoRaHS	0.74
NASHVILLE 5.2 WSW	CoCoRaHS	0.75

The Month in Comparison:

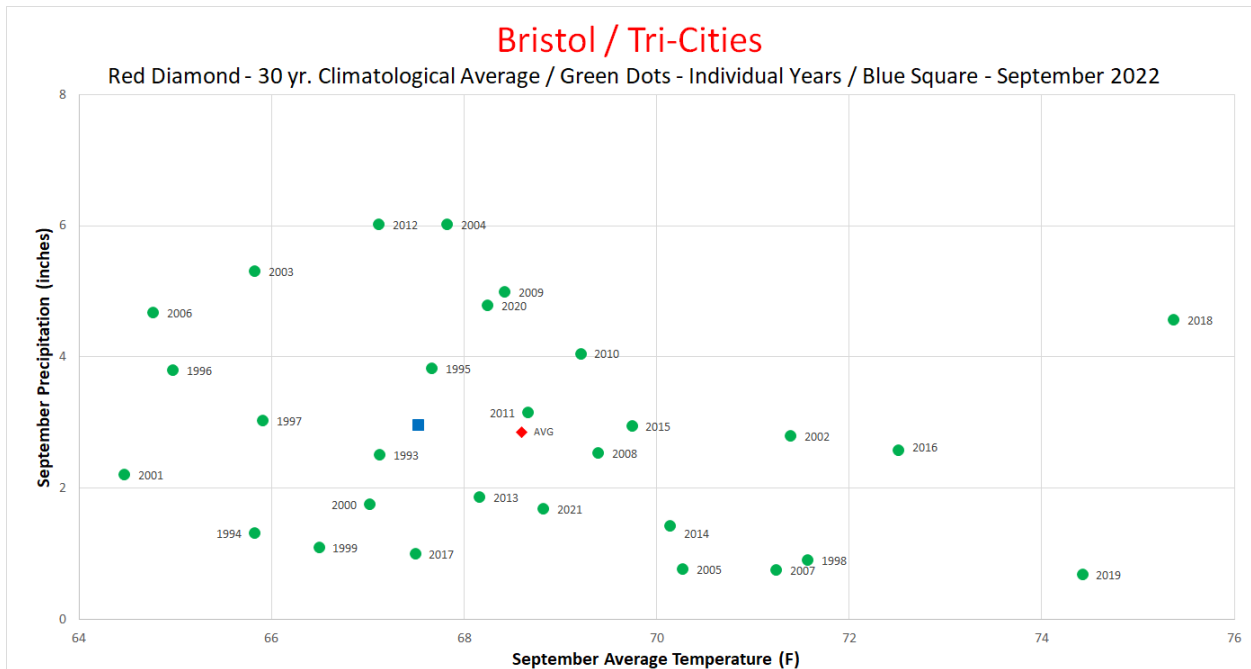
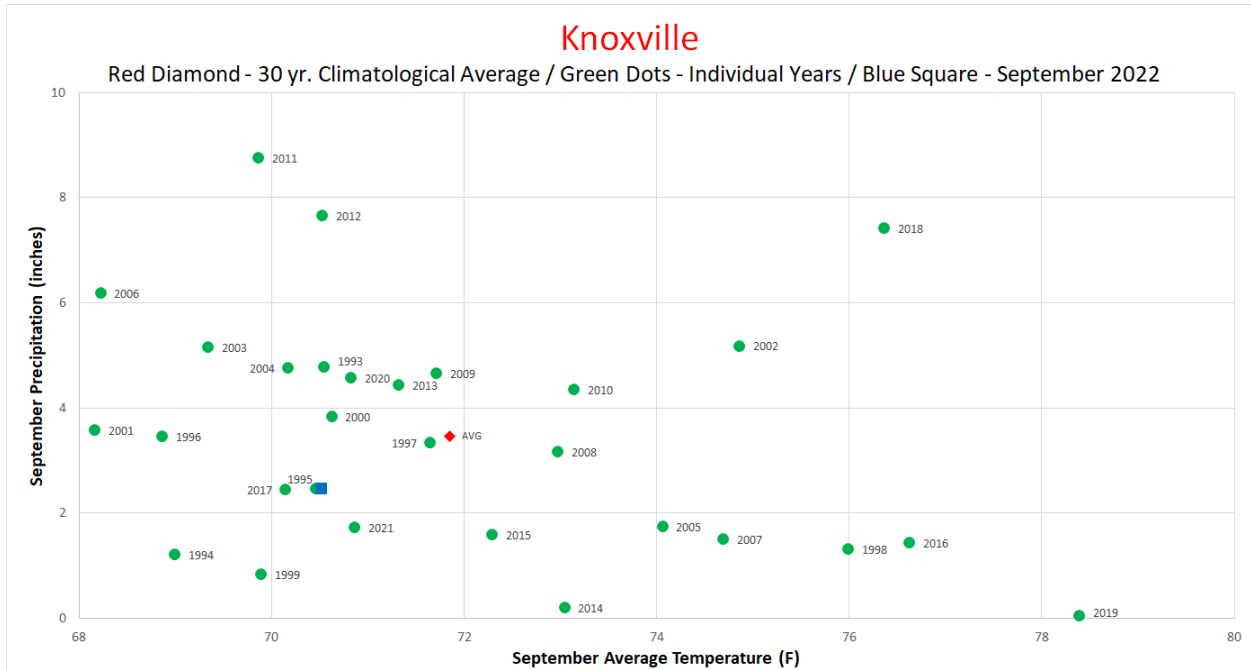
Comparing the mean temperature and total precipitation for September 2022 to the conditions of September during the past 30-years at select automated airport weather stations, it was drier than average at all stations except the Bristol/Tri-Cities airport. Despite the dry conditions, September is one of the drier months across Tennessee and 2022 was not a top-5 driest September of the past 30-years for any airport. The Memphis and Nashville airport weather stations were warmer than average for the past 30-years, while the other airports all recorded a cooler than average September, but September 2022 was not among the top-5 warmest or coolest Septembers of the past 30-years for any of the stations.



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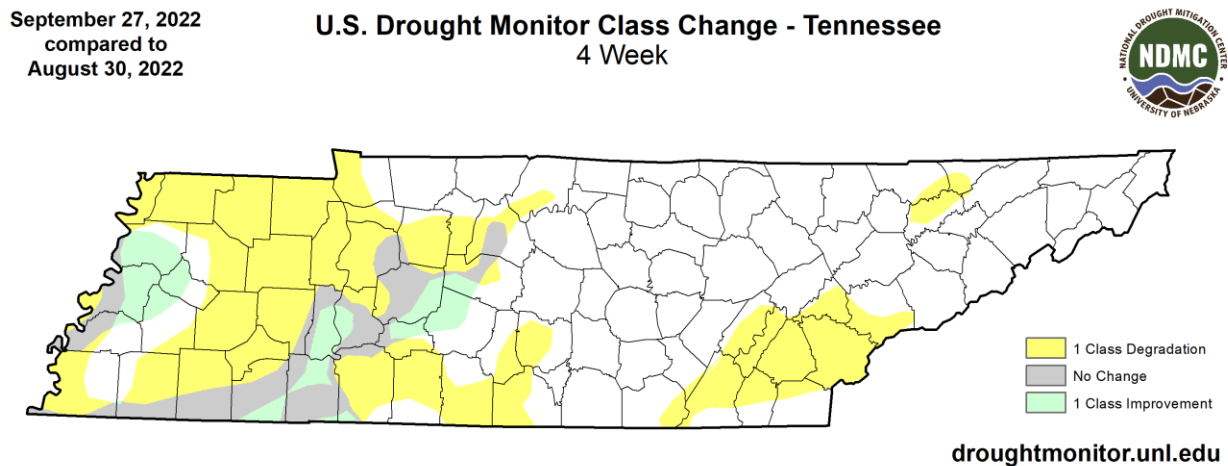
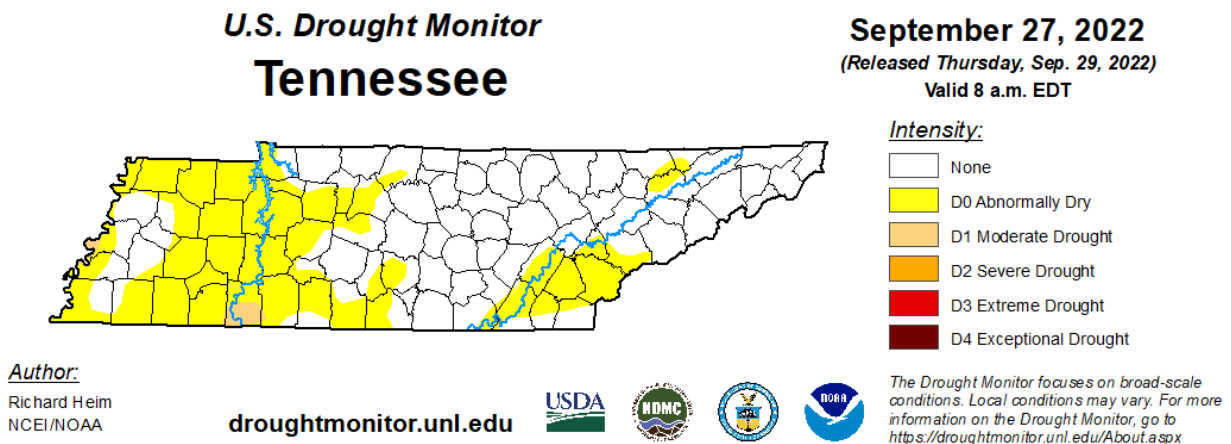


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Drought Monitor:

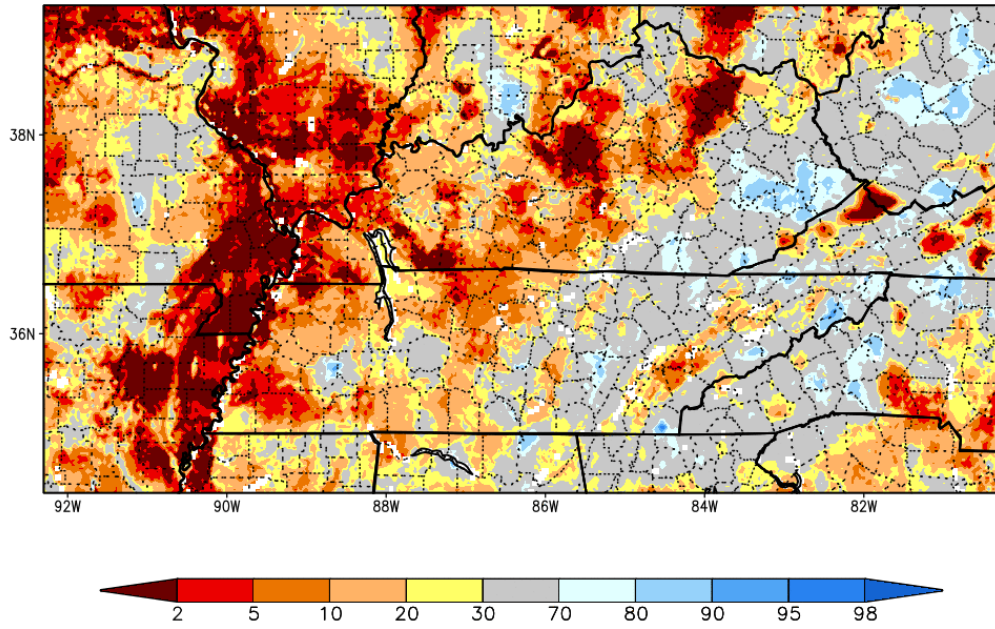
Tennessee saw the expansion of Abnormally Dry (D0) conditions in many parts of the state, with the largest expansions in West and Middle Tennessee through September. Although there were a few small areas of improvement during the month, mostly from the heavy rains at the end of August and in the first week of September. Tennessee started September with 0.93% of the state’s area in Moderate Drought (D1) and 3.33% of the state’s area in Abnormally Dry (D0) conditions, in the September 6th release of the U.S. Drought Monitor. We ended the month with a similar level of D1 (at 0.99% of the state’s area), but with an expansion of D0, now covering 40.21% of the state’s area. Dry conditions in the start of October will likely lead to expansion and worsening of drought conditions in the state.



Soil Moisture:

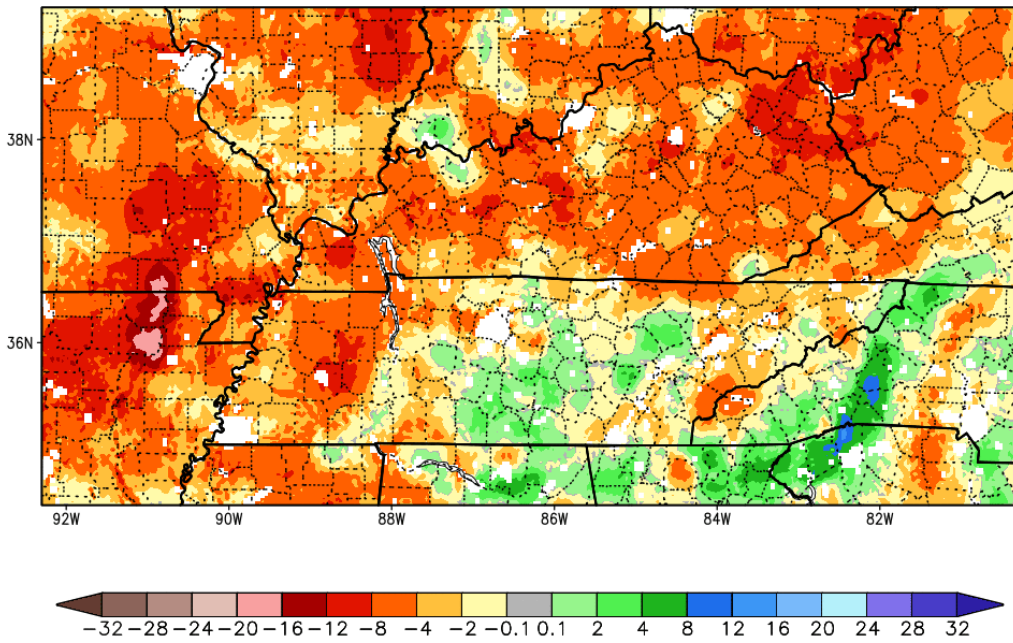
The lack of rainfall in the second half of the month combined with record heat in the third week of the month for parts of West and Middle Tennessee, resulting in large decreases in soil moisture levels in those areas of the state. The NASA SPoRT Land Information System shows that most areas of West and Middle Tennessee currently have below average soil moisture levels for the top 2-meters of the ground. There are some drier than normal areas showing up in the eastern Tennessee Valley area as well, but there are also pockets of above normal soil moisture levels in East Tennessee. The USDA reported that topsoil moisture was 7% very short, 43% short, 49% adequate, and 1% surplus, and subsoil moisture was rated 6% very short, 36% short, 57% adequate, and 1% surplus by the last week of September.

SPoRT-LIS 0-200 cm Soil Moisture percentile valid 30 Sep 2022



NOTE
Experimental

1-Month Difference in Column Relative Soil Moisture (%) valid 12z 30 Sep 2022



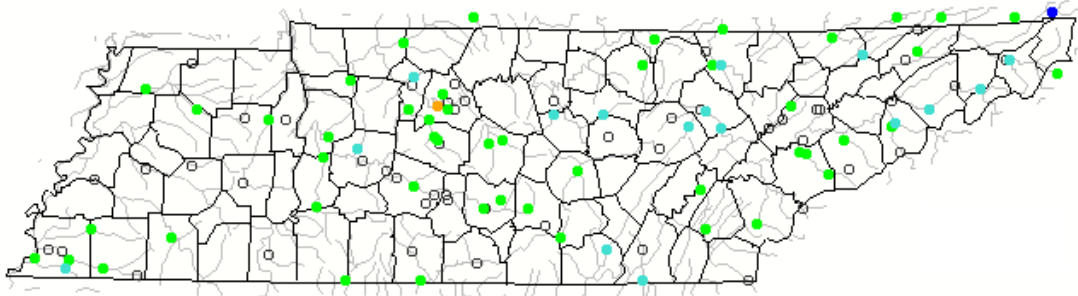
NOTE
Experimental

Streamflow:

Most stream gauges in Tennessee were in the normal flow range, averaged over September, with several in East Tennessee and on the Cumberland Plateau averaging above normal flow levels for the month. However, with the lack of rainfall in the second half of the month, stream gauges were beginning to show below normal flow levels for parts of the state by the end of September.

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

September 2022



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		

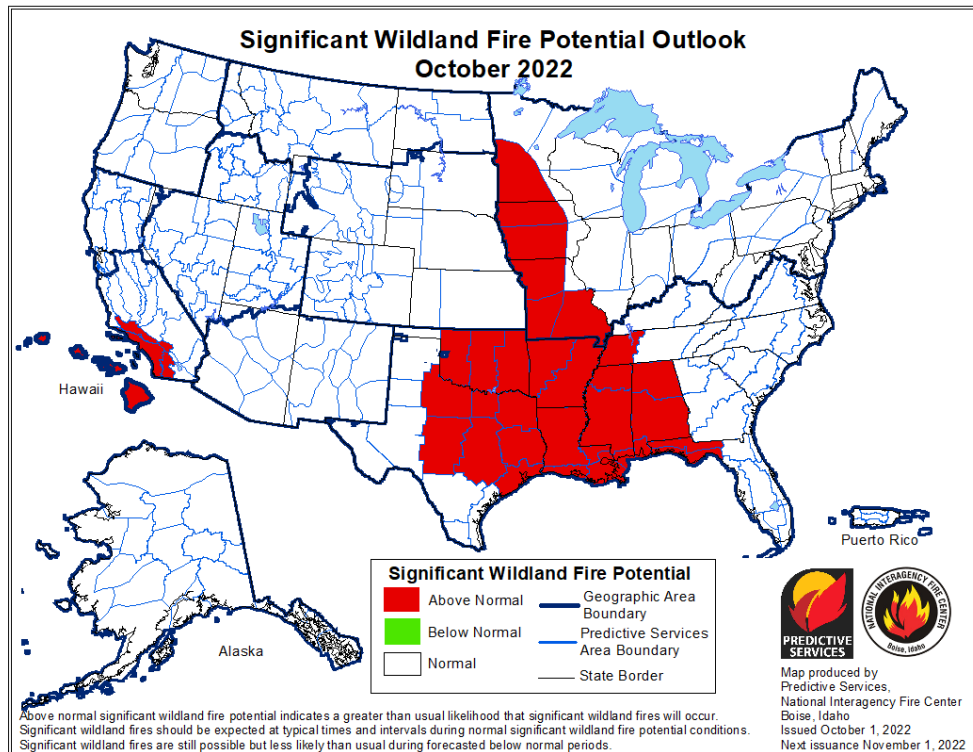


Miscellaneous:

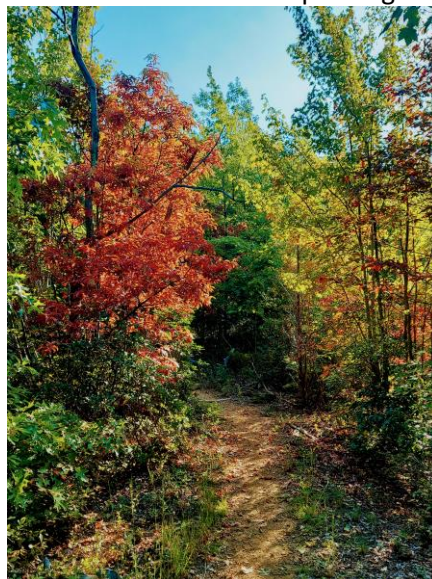
Crop Conditions from USDA: During September most of the corn crop was harvested, with yields and conditions below normal, 42% of the crop was reported in Poor or Very Poor condition by the USDA. This was largely due to drought conditions present in western Tennessee during June and July. The cotton harvest began towards the end of September and the dry weather was beneficial for this process, and the majority of the crop was reported in Good or Excellent condition. Soybean harvest also began with the majority of the crop reported in Fair or Good condition. Winter wheat planting also began this month, but rain is needed to ensure growth during the fall.

CROP PROGRESS	This Week	Last Week	2021	5 Year Avg.	CONDITION					
					Item	Very Poor	Poor	Fair	Good	Excellent
	Percent					Percent				
Corn – Mature	96	89	96	96	Cattle	1	4	30	54	11
Corn – Harvested	64	42	55	67	Corn	15	27	33	23	2
Cotton – Bolls Opening	69	57	53	78	Cotton	2	10	32	50	6
Cotton – Harvested	6	2	1	10	Soybeans	2	11	37	40	10
Soybeans – Dropping Leaves	75	55	60	69	Pasture	5	15	36	39	5
Soybeans – Harvested	21	13	14	20						
Tobacco – Cut	86	81	88	91						
Winter Wheat – Planted	11	10	15	11						
Winter Wheat – Emerged	5	3	7	4						

Fire Danger: The National Interagency Fire Center outlook for October indicates that West Tennessee will have above normal potential for significant wildland fires for the next month. This is largely due to the lack of rainfall over the past month combined with below normal humidity and an outlook for a drier and warmer than normal October.



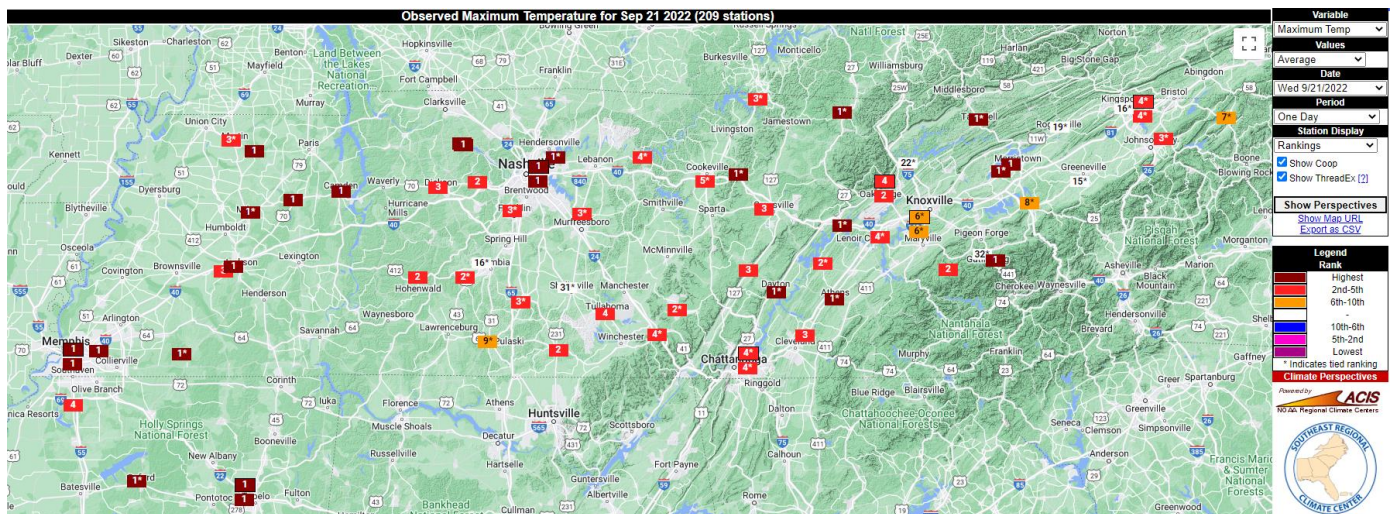
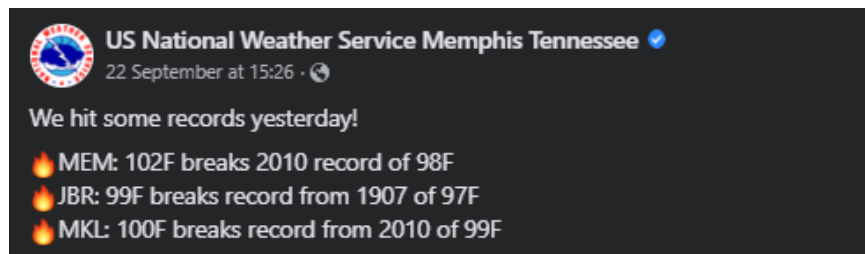
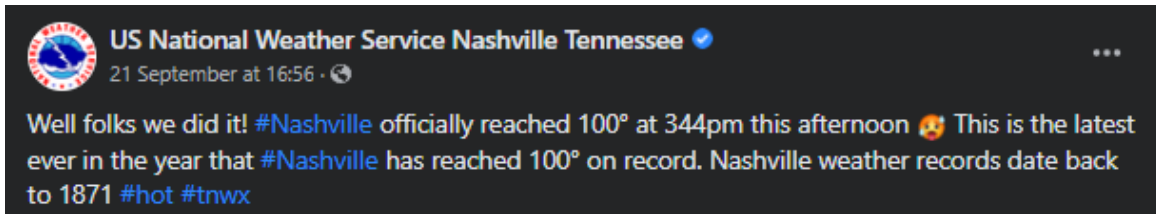
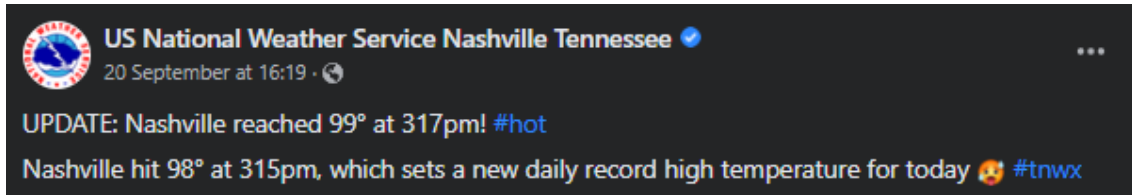
Fall Foliage: Cooler than normal conditions during the end of September, especially the overnight temperatures, in East Tennessee and the Cumberland Plateau are setting up conditions for a good showing of fall color. Northeast Tennessee and the northern parts of the Cumberland Plateau have also had consistent rainfall through the summer which will improve the fall colors. Color is forecast to peak at higher elevations by middle October with lower elevations peaking near the end of October.



Fall colors beginning to appear in the mountains of East Tennessee by late September (via William Tollefson).

Story of the Month:

The major story of September was the push of record-breaking heat across Tennessee in the final days of summer. Nashville International Airport set record highs on back-to-back days, September 20 and 21, reaching 100°F on the 21st. That was the latest calendar day the city has recorded a 100°F temperature, with weather records going back to 1871! The Jackson Airport also reached 100°F on the 21st and Memphis International Airport reached 102°F! This was also the latest calendar date that Memphis has recorded a 100°F day, with weather records going back to 1872. Temperatures in East Tennessee also soared into the 90's on the last full day of summer 2022. Across Tennessee, all long-term weather stations reported a top-10 warmest day on record for September 21 in 2022.



This extreme heat was broken the next day by a strong cold front that ushered in a major cool down for the first day of Fall. There was even early season frost reported at a few locations across the state by the end of September.

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](https://www.spc.noaa.gov) for any updates.

There were 3 days with severe storms reported in Tennessee with no tornados or severe hail reports, but 10 severe wind damage reports.

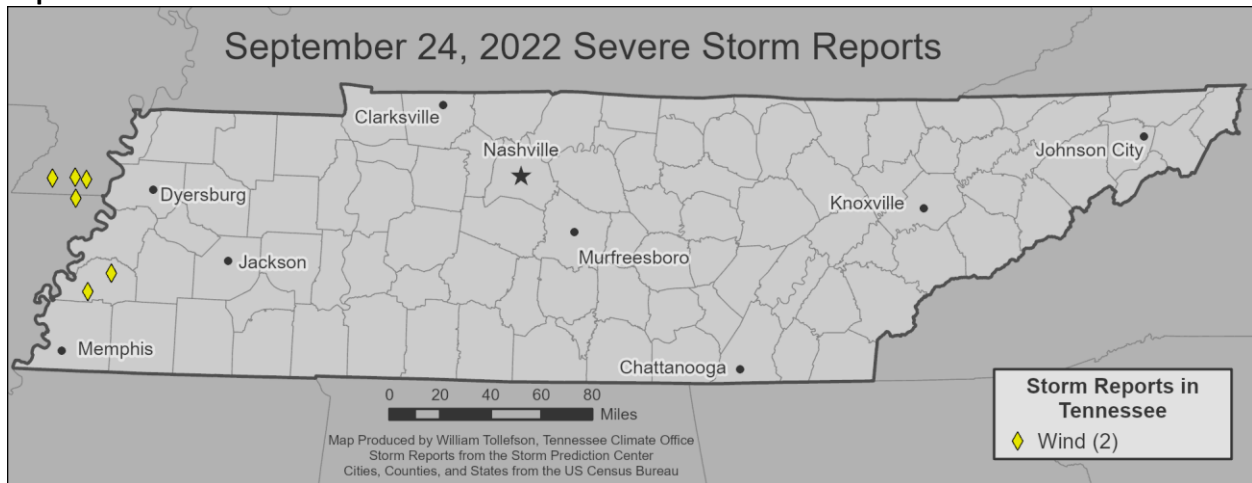
September 3



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
2:15	--	1 SSW TULLAHOMA	COFFEE	35.36	-86.22	TREE DOWN ON CAR IN THE BEL-AIRE COMMUNITY IN TULLAHOMA. - TWITTER REPORT-. (OHX)

September 24



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
2:10	--	MUNFORD	TIPTON	35.45	-89.81	SEVERAL TREES DOWN ACROSS TOWN. (MEG)

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Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
2:15	--	COVINGTON	TIPTON	35.56	-89.65	TREES AND POWERLINES DOWN ACROSS COVINGTON. WINDS ALSO CAUSED SIGNIFICANT DAMAGE TO TEMPORARY STRUCTURES AND TENTS IN THE TOWN SQUARE SET UP FOR THE HERITAGE FESTIVAL. (MEG)

September 25



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
21:35	--	5 N HOWARD QUARTER	HANCOCK	36.55	-83.41	NUMEROUS TREES DOWN WITH TIME ESTIMATED FROM RADAR. (MRX)
21:40	--	3 W NORMA	SCOTT	36.33	-84.45	TREE AND POWERLINES DOWN NEAR NORMA WITH THE TIME ESTIMATED FROM RADAR. (MRX)
21:50	--	1 S SNEEDVILLE	HANCOCK	36.52	-83.21	NUMEROUS TREES DOWN WITH TIME ESTIMATED FROM RADAR. (MRX)
22:20	--	4.5 NNW CHURCH HILL	HAWKINS	36.59	-82.74	MULTIPLE TREES DOWN OFF STANLEY VALLEY ROAD NEAR THE TN/VA BORDER. (MRX)
22:40	--	2 SE KINGSFORT	SULLIVAN	36.51	-82.53	MULTIPLE LARGE TREES DOWN IN COLONIAL HEIGHTS NEIGHBORHOOD. (MRX)
23:03	--	2 NE JOHNSON CITY	WASHINGTON	36.35	-82.33	SEVERAL TREE BRANCHES BLOWN ONTO GROUND. REPORTED BY TRAINED SPOTTER. (MRX)
23:20	--	HARTFORD	COCKE	35.81	-83.15	PHOTOS OF TREES AND SEVERAL LARGE BRANCHES BLOWN DOWN RELAYED VIA SOCIAL MEDIA. (MRX)

CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center indicates that West and Middle Tennessee are leaning towards a warmer than normal October, with higher confidence for warmer conditions in West Tennessee. There are equal chances for above or below normal temperatures for East Tennessee. Similarly, West and Middle Tennessee are leaning towards a drier than normal October, with higher confidence in the West, while East Tennessee has equal chances for above or below normal precipitation in October.

