October 2024 Tennessee State Climate Summary

*Tennessee Climate Office * East Tennessee State University*
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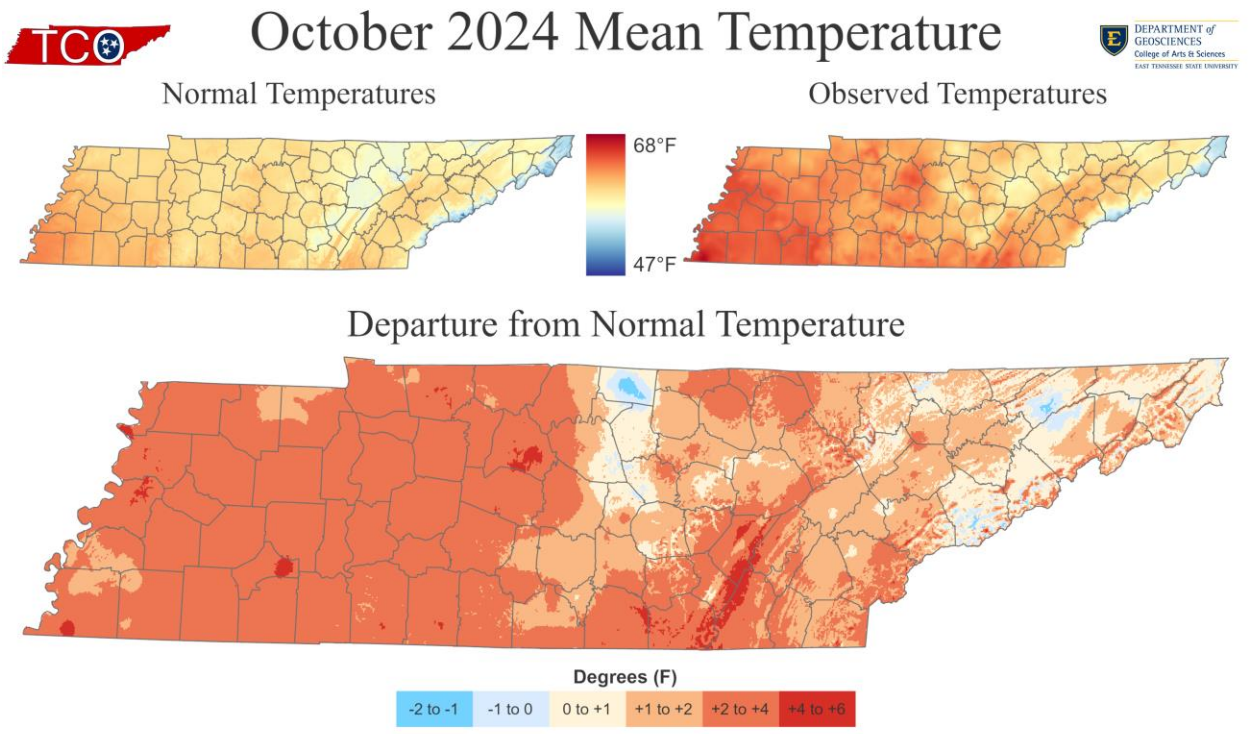
With contributions by Climate Data Representatives across the state

Monthly Temperature Summary:

October 2024 averaged out to be warmer than normal for most parts of the state, with the majority of the western two-thirds of the state averaging 2-4°F warmer than normal for the month. Northeast Tennessee and a few counties in Middle Tennessee were closer to normal or even a degree or two cooler than normal for the month. The month started and ended with mean temperatures that were well above normal, in the range of 6-9°F, but a strong cold spell impacted the state in the middle of the month, with mean temperatures that were 6-9°F cooler than normal. Unlike several of the last fall seasons, the warmer than average temperatures were driven largely by daytime highs, as nighttime temperatures were within a couple of degrees of normal, but the lack of rainfall and long stretches of sunny days helped high temperatures to climb to 4-7°F above normal for the month. There were 25 broken and 23 tied daily high temperature records at weather stations across the state this month. There were also seven broken and four tied daily records for warmest low temperatures set this month. Along with the cool spell in the middle of the month, there were five broken and five tied daily low temperature records and nine broken and six tied daily records for coolest high temperatures this month. All broken and all but one tying cold-temperature records were set between October 15 and October 17.



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	68
DYERSBURG MUNICIPAL AP	WBAN	66.1
SHILOH NMP TENNESSEE	RAWS	65.9
MEMPHIS WFO	WBAN	65.9
WAYNESBORO	COOP	65.8

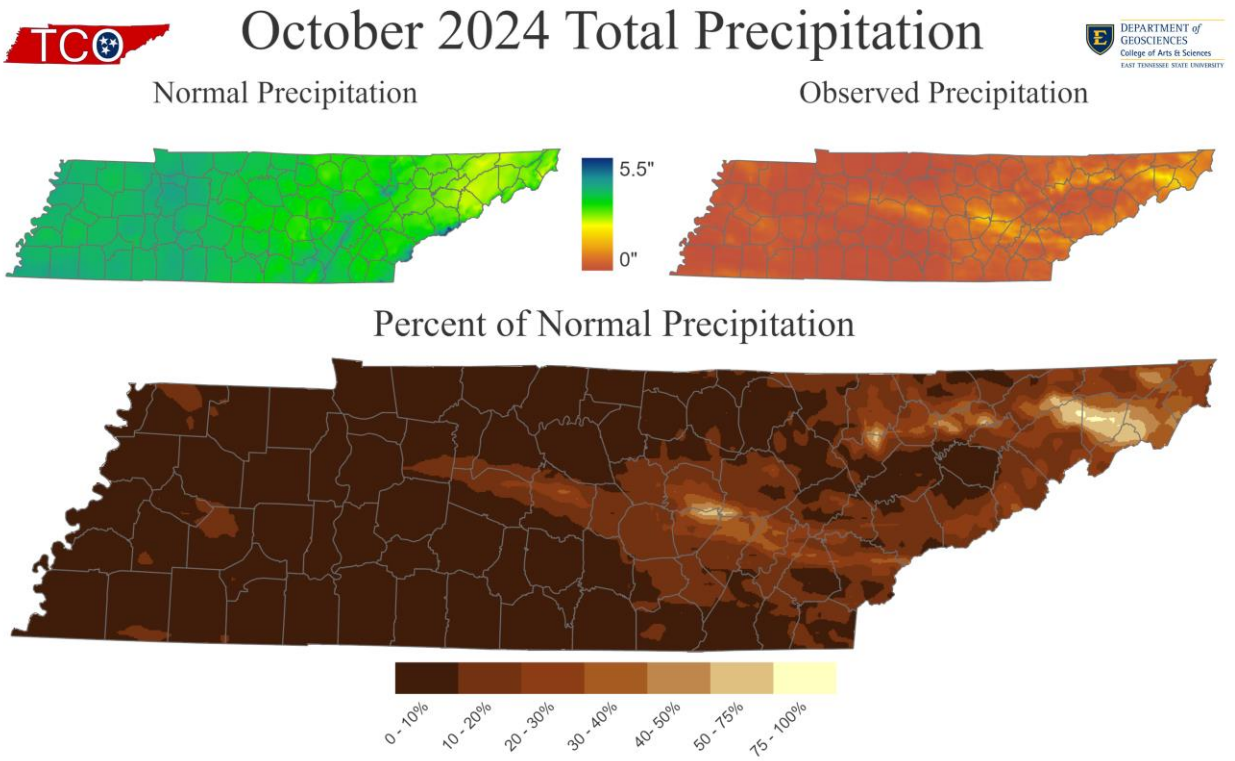
Map Data from PRISM Climate Group, Oregon State University. 1991-2020 Climate Normals Used. Station Data Retrieved From xmACIS2.

Stations with the lowest mean temperature

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	45.9
MOUNTAIN CITY 2	COOP	53.7
NEWFOUND GAP	COOP	55
GATLINBURG 2 SW	COOP	56.8
ONEIDA	COOP	56.8

Monthly Precipitation Summary:

October, which is usually the driest month of the year for Tennessee, was exceedingly dry this year, with virtually no widespread rainfall recorded until October 31. Even with the rain on Halloween, no areas of the state recorded above normal rainfall this month. There was some light, spotty rainfall each week, with the northeast corner of the state having the most consistent shower covereage. On October 26 there was a small storm in Middle Tennesee and another in northeast Tennessee that produced higher rainfall totals, which is evident in the two streaks of slightly higher rainfall totals in this month's precipitation maps. A frontal boundary brought widespread rains to the western half of the state on Halloween with totals of 0.5-1.5-inches. This rainfall occurred after 8am EDT/7am CDT, and so is not reflected in the gridded precipitaiton data or COOP and CoCoRaHS station totals for October since it was after the standard reporting time on October 31*. No weather stations in the state set a daily total precipitaiton record this month, but the cool weather in the middle of the month brought the first snow to mountains in East Tennessee, at elevations above 4,000ft. The Mt LeConte COOP station reported 2.99-inches of snow on October 16, setting a new daily snowfall record.



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
JONESBOROUGH 2.7 SSW	CoCoRaHS	1.89
JONESBOROUGH 2.5 SSW	CoCoRaHS	1.78
ROAN MOUNTAIN 7.1 W	CoCoRaHS	1.71
JACKSON MCKELLAR- SIPES AP	WBAN	1.5
MONTEREY	COOP	1.26

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

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
ADAMS 7.9 SW	CoCoRaHS	0
ADAMS 8.0 SW	CoCoRaHS	0
BARTLETT 3.1 NNE	CoCoRaHS	0
BETHPAGE 1 S	COOP	0
CLARKSVILLE 3.3 SSE	CoCoRaHS	0

***Notes:** Table for stations with the least precipitation covers the first 5 stations in alphabetical order of stations that had no missing data for October 2024 and reported 0 rainfall in October out of a total of 20 stations that met both of these criteria. The October Precipitation Dataset (PRISM) cuts off at 12Z or 8am EDT October 31 and most CoCoRaHS and COOP stations report rainfall at 7am local time. The western two-thirds of the state had radar estimated rainfall ranging from 0.25-inches to 1.5-inches from 8am EDT October 31 to 8am EDT November 1 that will be reported with November rainfall in these databases.*

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	79.8	56.2	68.0	**+3.4**	91	10/6	40	10/17	0.76	**-3.22**	**19%**
Jackson	80.0	51.0	65.5	**+4.8**	91	10/6	33	10/17	1.50	**-2.13**	**41%**
Clarksville	77.6	48.8	63.2	**+3.9**	89	10/6	34	10/17	0.64	**-3.49**	**15%**
Nashville	78.5	52.1	65.3	**+3.6**	90	10/6	37	10/17	0.49	**-2.87**	**15%**
Chattanooga	78.4	53.2	65.8	**+3.1**	89	10/6	37	10/17	0.15	**-3.44**	**4%**
Crossville	71.7	46.6	59.2	**+2.8**	82	10/6	29	10/17	0.48	**-2.66**	**15%**
Knoxville	75.1	49.7	62.4	**+2.1**	85	10/6	35	10/17	0.08	**-2.73**	**3%**
Bristol	74.0	43.7	58.9	**+1.6**	83	10/6	31	10/18	0.36	**-2.16**	**14%**

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
WAYNESBORO	COOP	93	7
CLARKSVILLE WWTP	COOP	92	6
COOKEVILLE	COOP	91	6
CAMDEN	COOP	91	6
SHILOH NMP TENNESSEE	RAWS	91	6
MEMPHIS INTERNATIONAL AP	WBAN	91	6
JACKSON MCKELLAR- SIPES AP	WBAN	91	6
SAVANNAH 6 SW	COOP	90	6
JACKSON EXP STA	COOP	90	7
TENNESSEE RIDGE	COOP	90	6
NASHVILLE BERRY FIELD	COOP	90	7
DECATURVILLE	COOP	90	7
JACKSON 4 NE	COOP	90	7
MOUSETAIL LANDING SP	COOP	90	6
CAMDEN TOWER TENNESSEE	RAWS	90	6
MERIWETHER LEWIS TENNESSEE	RAWS	90	6
DYERSBURG MUNICIPAL AIRPORT	WBAN	90	6
MEMPHIS WFO	WBAN	90	7
NASHVILLE INTL AP	WBAN	90	6

Twelve stations tied for the 8th hottest temperature (90°F)

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	19	18
LEWISBURG EXP STA	COOP	23	16
SPARTA WASTEWATER PLANT	COOP	24	18
NEWFOUND GAP	COOP	26	18
KINGSTON SPRINGS	COOP	27	18
MOUNTAIN CITY 2	COOP	27	19
COALMONT	COOP	27	18
CROSSVILLE AREA OFFICE TENN	RAWS	27	17
ONEIDA	COOP	28	18
FALL CREEK FALLS SP	COOP	28	19
ROAN MOUNTAIN 3SW	COOP	28	21
BLEDSOE SF TENNESSEE	RAWS	28	17
CROSSVILLE 7 NW	WBAN	28	17

Five stations tied for the 9th coldest temperature (28°F)

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	68
DYERSBURG MUNICIPAL AP	WBAN	66.1
SHILOH NMP TENNESSEE	RAWS	65.9
MEMPHIS WFO	WBAN	65.9
WAYNESBORO	COOP	65.8
CHATTANOOGA AP	WBAN	65.8
LEWISBURG TOWER TN	RAWS	65.7
JACKSON MCKELLAR-SIPES AP	WBAN	65.5
NASHVILLE INTL AP	WBAN	65.3
CAMDEN TOWER TENNESSEE	RAWS	64.9

Coolest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	45.9
MOUNTAIN CITY 2	COOP	53.7
NEWFOUND GAP	COOP	55
GATLINBURG 2 SW	COOP	56.8
ONEIDA	COOP	56.8
GREENEVILLE EXP STA	COOP	57.3
CROSSVILLE 7 NW	WBAN	57.4
NEWCOMB	COOP	57.5
NORRIS	COOP	58.2
TAZEWELL	COOP	58.2
MAYNARDVILLE	COOP	58.2
CHEROKEE TENNESSEE	RAWS	58.2

Four stations tied for the 10th coolest temperature (58.2°F)

Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
JONESBOROUGH 2.7 SSW	CoCoRaHS	1.89
JONESBOROUGH 2.5 SSW	CoCoRaHS	1.78
ROAN MOUNTAIN 7.1 W	CoCoRaHS	1.71
JACKSON MCKELLAR- SIPES AP	WBAN	1.5
MONTEREY	COOP	1.26
ALAMO 1 N	COOP	1.22
MT LECONTE	COOP	1.21
MOUNTAIN CITY 2	COOP	1.2
DICKSON	COOP	1.14
MURFREESBORO 5.5 NNW	CoCoRaHS	1.11

Driest Stations (lowest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
ADAMS 7.9 SW	CoCoRaHS	0
ADAMS 8.0 SW	CoCoRaHS	0
BARTLETT 3.1 NNE	CoCoRaHS	0
BETHPAGE 1 S	COOP	0
CLARKSVILLE 3.3 SSE	CoCoRaHS	0
CLARKSVILLE 3.4 NNW	CoCoRaHS	0
CLARKSVILLE 4.0 WNW	CoCoRaHS	0
CLARKSVILLE 7.1 SE	CoCoRaHS	0
CROSS PLAINS 1.9 NNW	CoCoRaHS	0
DRESDEN	COOP	0
DYERSBURG 7.7 E	CoCoRaHS	0
GALLATIN 2.8 SW	CoCoRaHS	0
GREEN HILL 3.1 NNE	CoCoRaHS	0
HENDERSONVILLE 4.9 NNE	CoCoRaHS	0
LEBANON	COOP	0
LEBANON 7 N	COOP	0
LEWISBURG 6.2 SSE	CoCoRaHS	0
SPRINGFIELD 1.9 WSW	CoCoRaHS	0
SPRINGFIELD EXP STATION	COOP	0

An additional 7 stations reported 0 rainfall this month, but had between 1 and 4 missing days, and 19 other stations reported only a trace of rain in October 2024.

Snowiest Stations (highest snowfall totals):

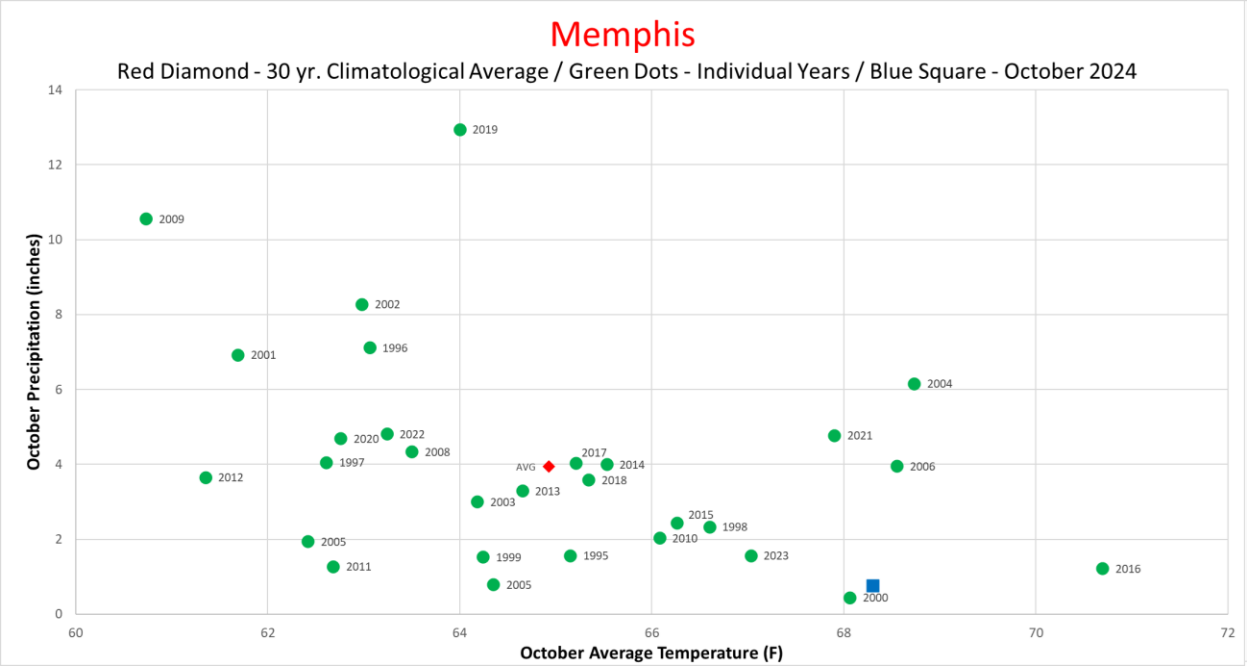
Station Name	Station Type	Total Snowfall (in)
MT LECONTE	COOP	3
NEWFOUND GAP	COOP	2.6

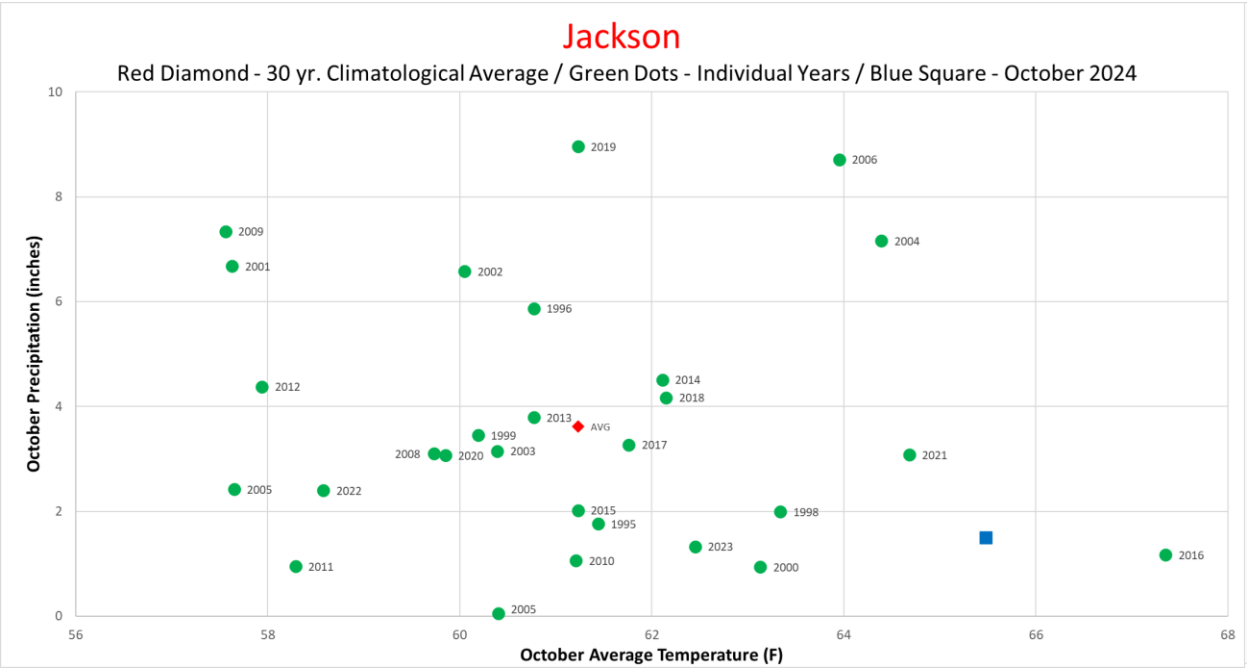
The Month in Comparison:

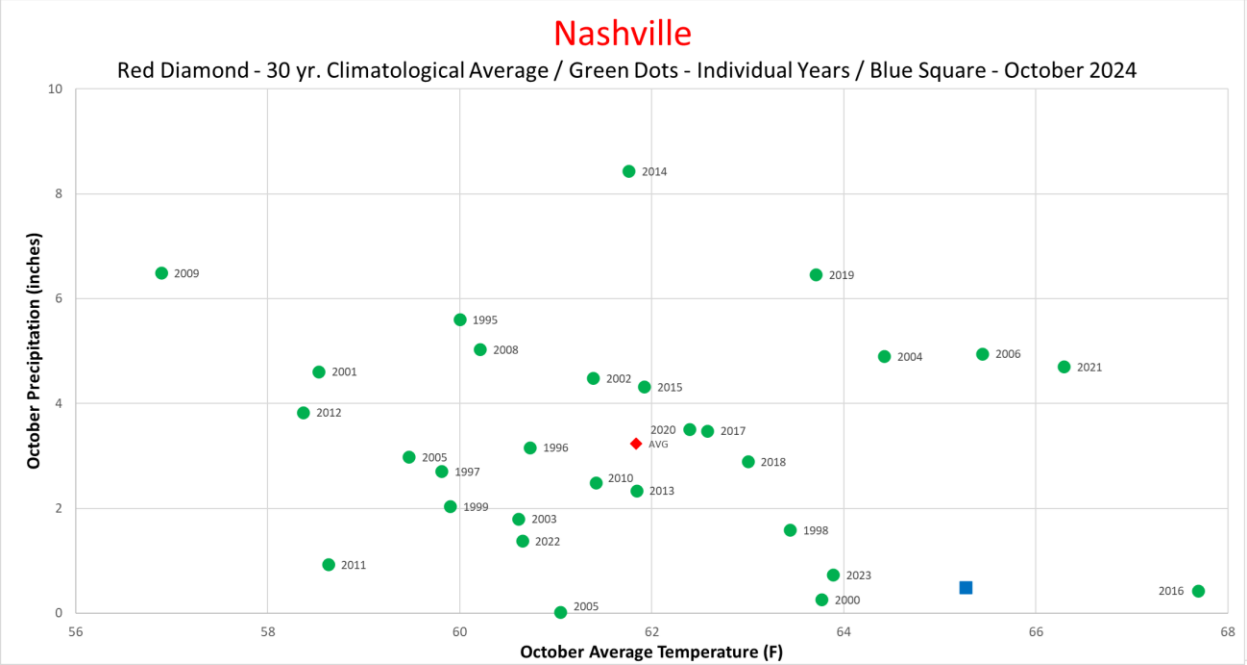
Comparing the mean temperature and total precipitation for October 2024 to the conditions of October for the past 30 years at select airport weather stations across the state shows that all stations were warmer and drier than average this month. Compared to conditions for October over the past 30 years, 2024 was the 2nd driest at Memphis, Chattanooga, Knoxville, and Tri-Cities, it was the 4th driest for Nashville, and 7th driest for Jackson. Compared to the mean temperature of October over the past thirty years, October 2024 was the 2nd warmest for Jackson, 4th warmest for Memphis and Nashville, 6th warmest for Chattanooga, and 7th warmest for Knoxville.

Looking at the longer-term records for these cities, this October was drier than normal. However, due to a couple of decent rain events at the end of the month, Memphis, Jackson, and Nashville did not have a top-10 driest October. However, the eastern half of the state missed out on most of the rainfall on Halloween. October 2024 was the 3rd driest on record for Chattanooga's 146-year history and Oak Ridge's 78-year history, 4th driest on record for Knoxville's 154-year history and Tri-Cities' 77-year history. Only Jackson had a top-10 warmest October based on mean temperatures, with 2024 being the 6th warmest

October in the 75-year history of the airport weather station there. None of these stations had a top-10 warmest or coolest average low temperature for this month, however all but Knoxville had a top-10 warmest October based on average high temperatures this month. The average high temperature for October 2024 was the 4th warmest for the Jackson airport, the 5th warmest for Chattanooga, tied for 6th warmest for Nashville, 8th warmest for Memphis and Tri-Cities, and 9th warmest for Oak Ridge.






Nashville
Red Diamond - 30 yr. Climatological Average / Green Dots - Individual Years / Blue Square - October 2024
October Precipitation (inches)
October Average Temperature (F)
AVG
2014
2009
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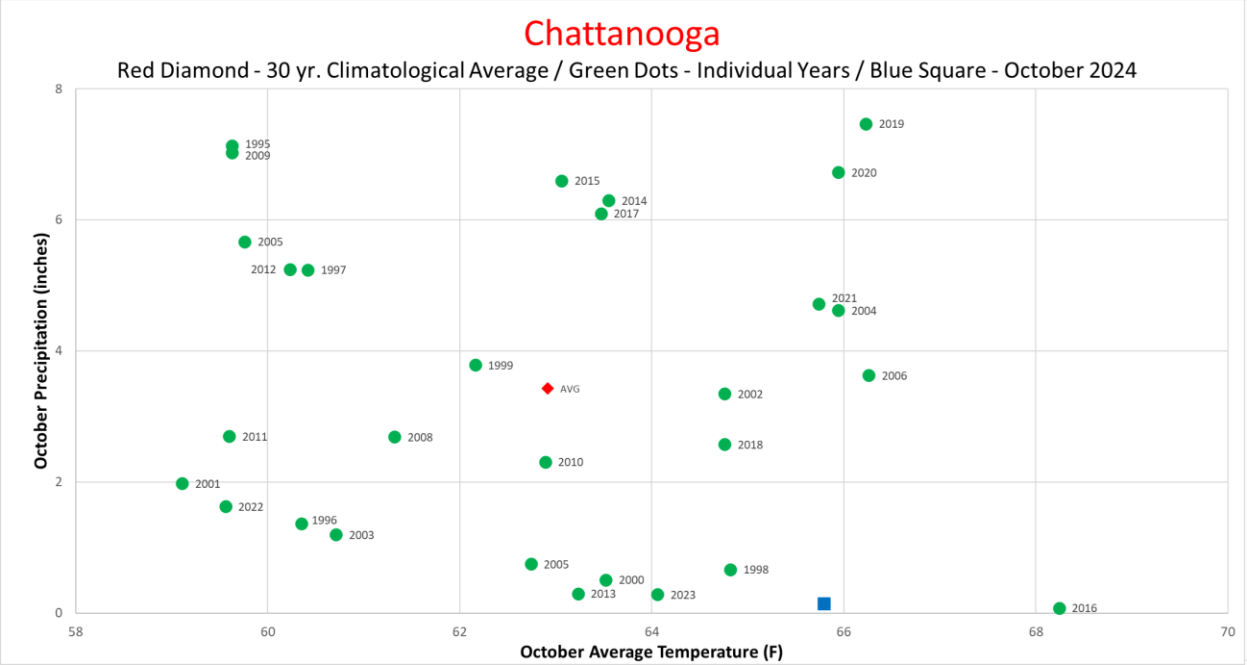
Chattanooga
Red Diamond - 30 yr. Climatological Average / Green Dots - Individual Years / Blue Square - October 2024
October Precipitation (inches)
October Average Temperature (F)
AVG
2019
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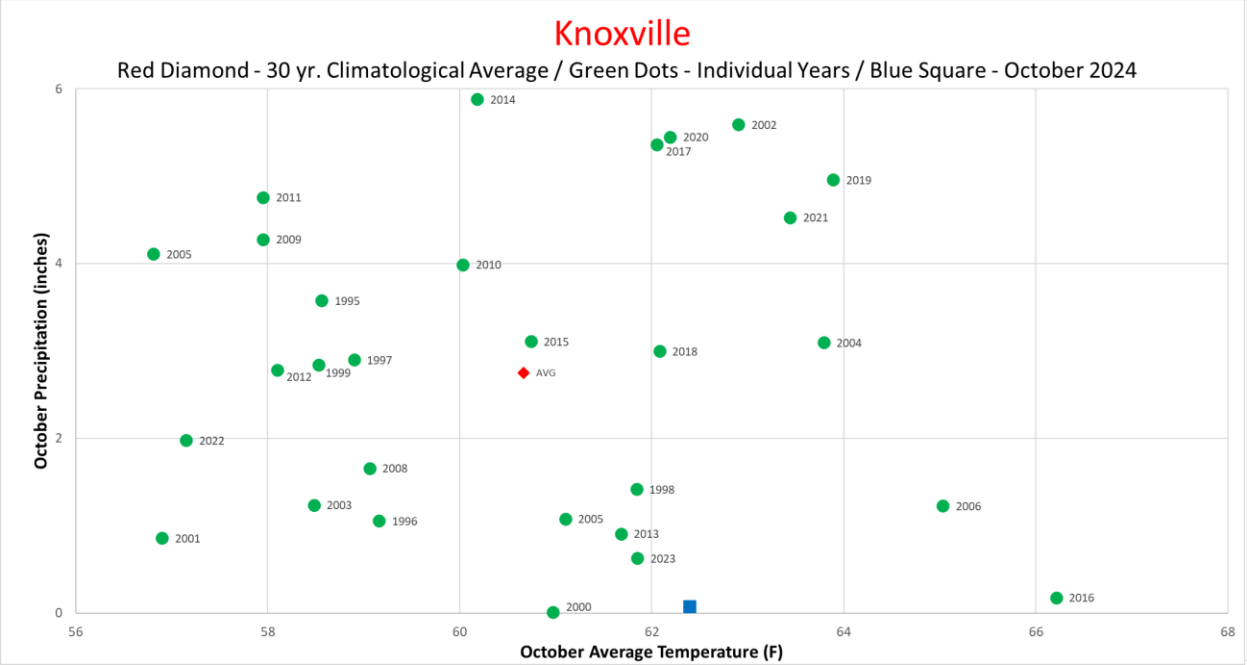
Knoxville
Red Diamond - 30 yr. Climatological Average / Green Dots - Individual Years / Blue Square - October 2024
October Precipitation (inches)
October Average Temperature (F)
AVG
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2002
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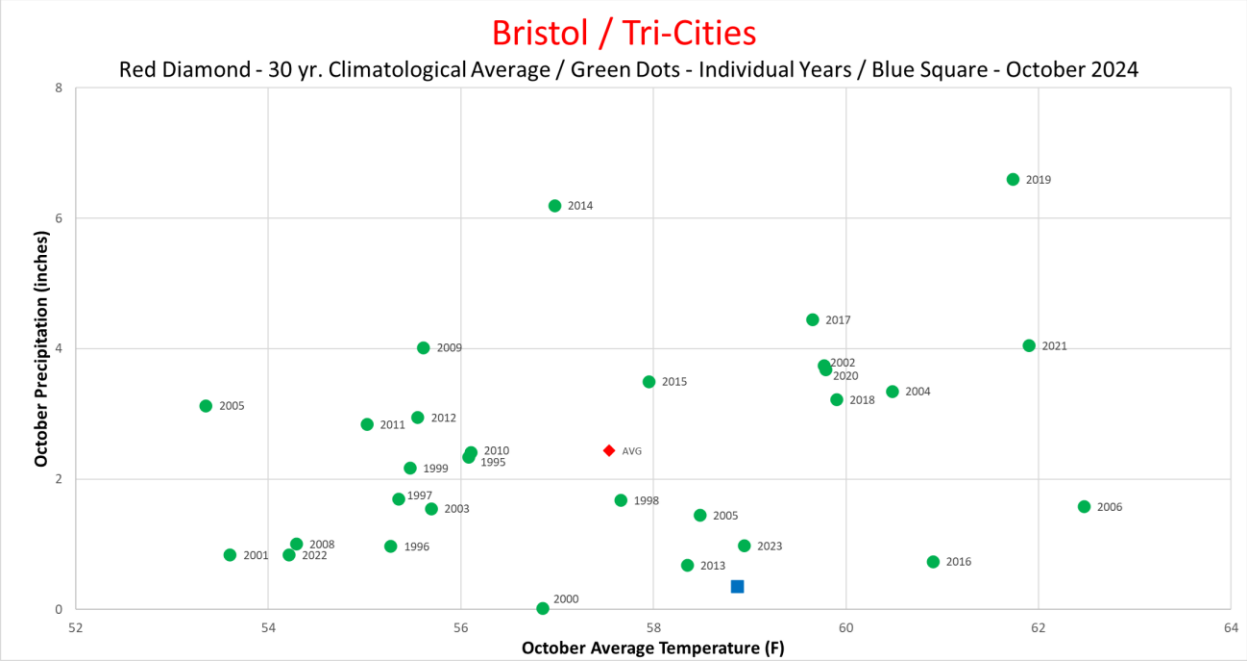
Bristol / Tri-Cities
Red Diamond - 30 yr. Climatological Average / Green Dots - Individual Years / Blue Square - October 2024
October Precipitation (inches)
October Average Temperature (F)
AVG
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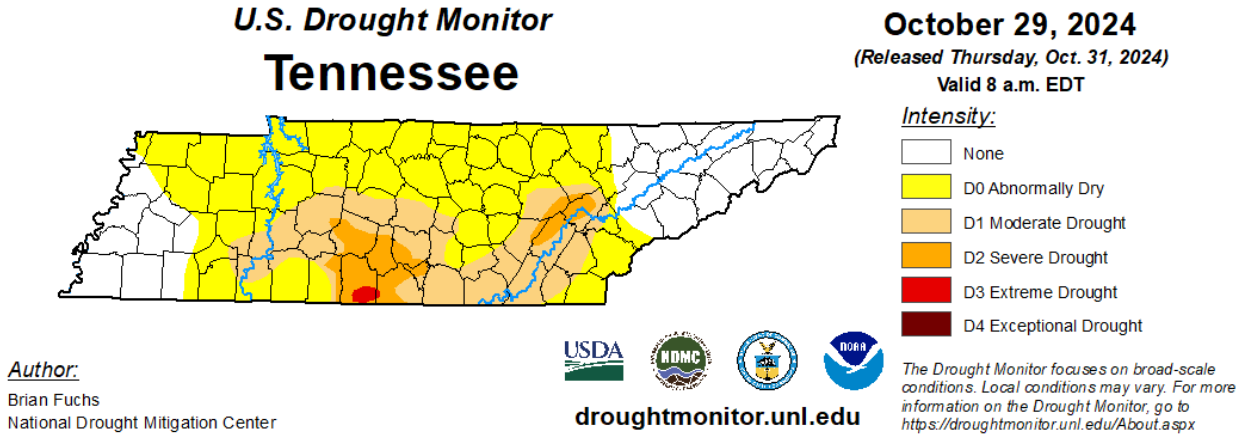
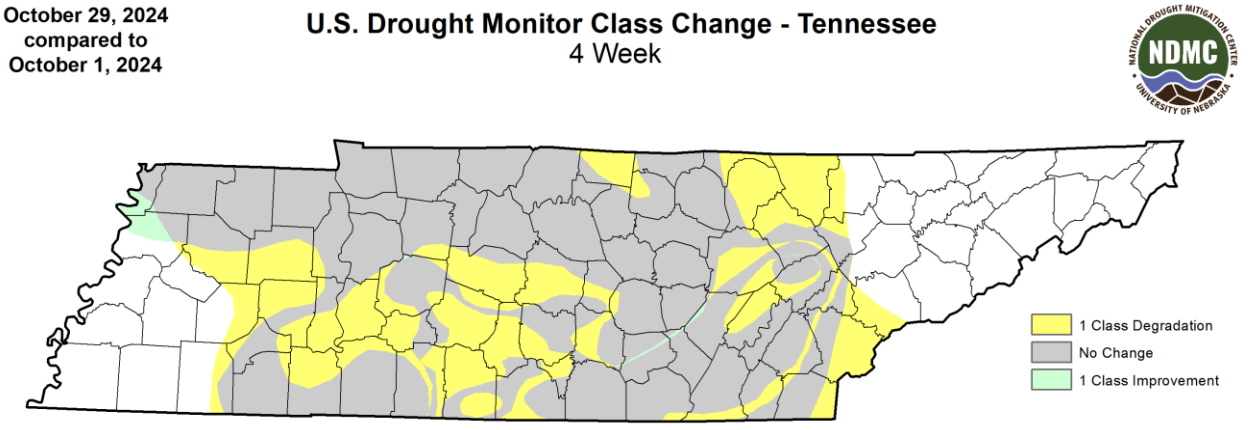
Drought Monitor:

Despite the lack of rain and much above normal high temperatures there was only minor expansion of Abnormally Dry and Drought conditions across the state during the month of October, largely due to the intense amount of rain that fell across the state in the final days of September. All of that rain helped to raise stream gauge levels and replenish soil moisture in the upper layers of the soil in the first half of October for many locations. But slowly over the month, stream gauges and soil moisture levels dropped with the surplus water essentially gone by the end of October. Once again, cattle producers felt the impacts of the drought the most, as ponds and streams quickly dried up again in October, especially in southern Middle Tennessee, the only area that had below normal rainfall in September.

On the October 29 edition of the U.S. Drought Monitor, 0.34% of the state was in Extreme Drought (D3) compared to 0% on the October 1 edition of the Drought Monitor, 6.17% of the state was in Severe Drought (D2) compared to 1.78% on October 1, and 20.65% of the state was in Moderate Drought (D1) compared to 17.09% on October 1. On the October 29 U.S. Drought Monitor map, 46.1% of Tennessee was shown in Abnormally Dry (D0) conditions, up slightly from the 44.9% of the state that was shown in Abnormally Dry conditions on October 1.





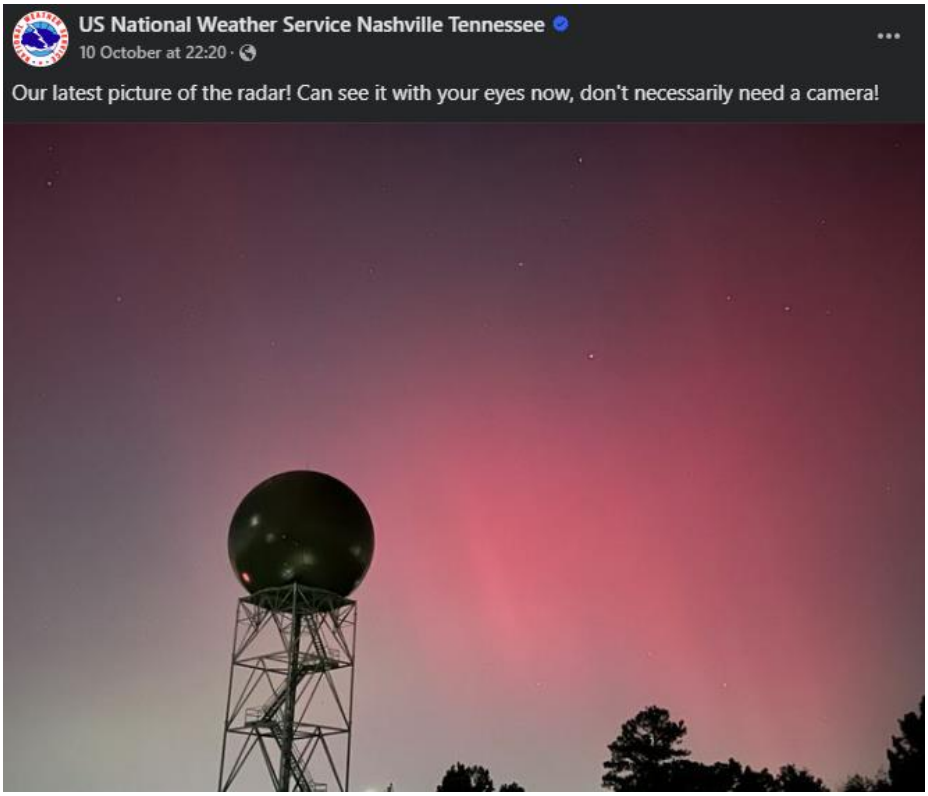
Stories of the Month:

Following an intense and devastating September, October was fortunately a much quieter month for weather stories across Tennessee, with the main weather events being the lack of rainfall for most of the month, temperature whiplash from two weeks with record heat interrupted by a week with record cold temperatures, and a second showing of the northern lights in Tennessee this year.

Dry conditions were observed across the state for most of October, with little widespread rainfall anywhere until Halloween. The weather station at the Nashville International Airport, with data from 1940 through today, had its 4th longest dry streak, with 26 days in a row without precipitation from September 30 – October 25, 2024.

Daily high temperature records were set between October 6 and 14, followed by a strong cold front that sent temperatures tumbling, producing frosts around the state and even snow for the highest mountains in East Tennessee. The cold air set daily low temperature records and record cool high temperatures from October 15 to 17. A few days later warm sunny skies and southerly winds brought record heat back to the state from October 23 to 31.

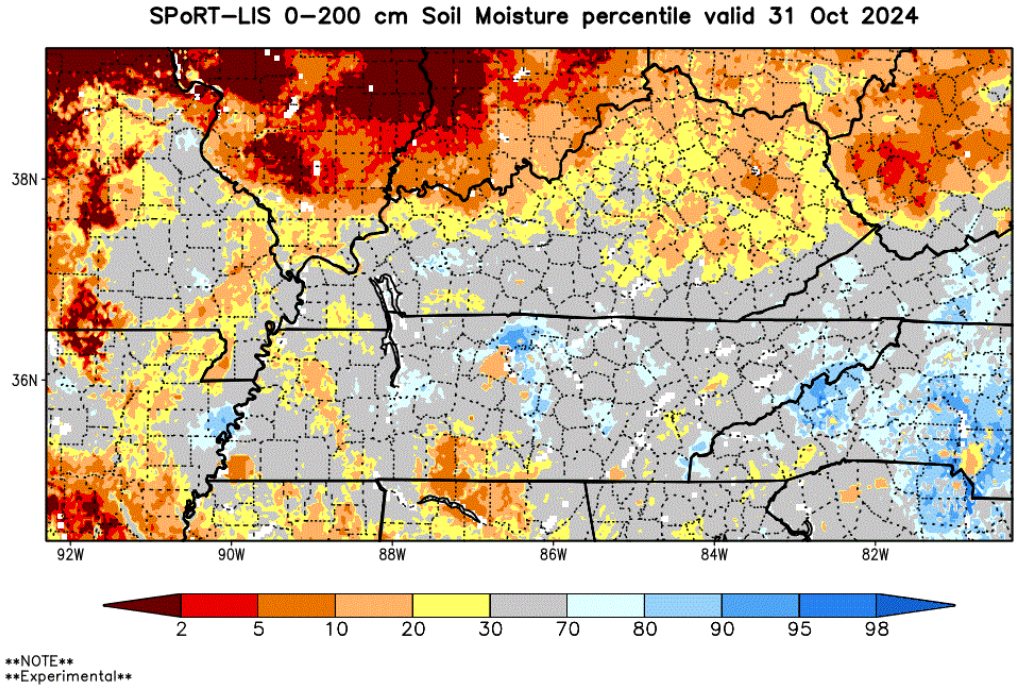
On the night of October 10, a strong solar storm hit earth and produced a strong display of the northern lights (aurora borealis) that was visible across Tennessee for the second time this year, following a display in May.

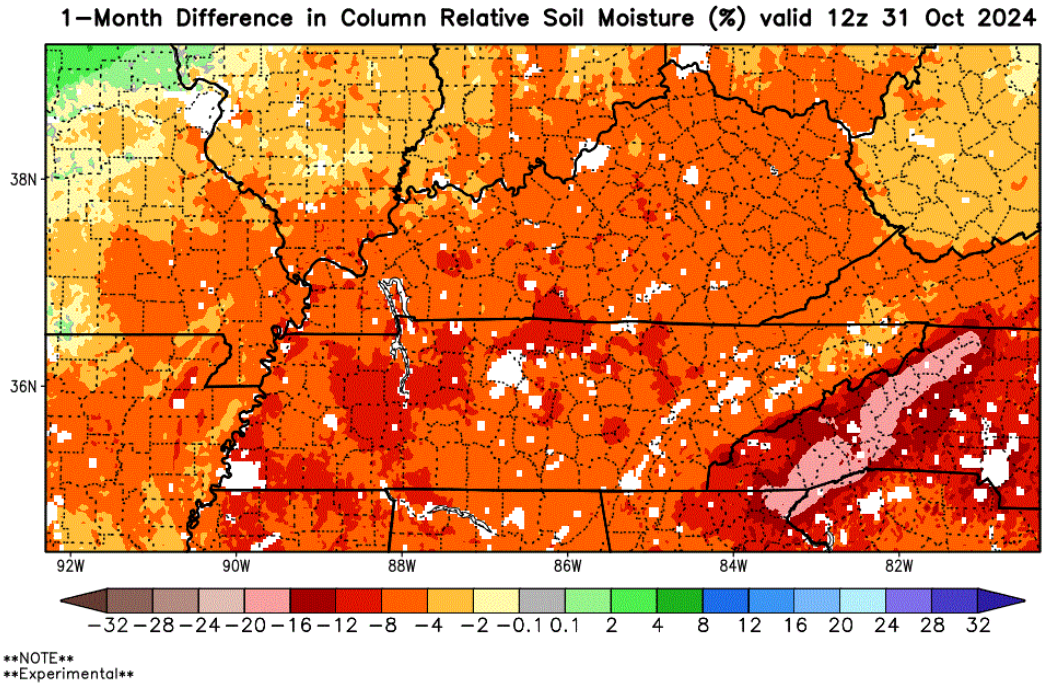


Soil Moisture:

The NASA SPoRT Land Information System still showed a few pockets of higher-than-normal soil moisture percentiles by the end of October, but over the month soil moisture levels fell by 4-12 percent across the state from the high levels seen after Helene. For the week ending October 28, the USDA reported topsoil moisture as 28% very short, 38% short, and 34% adequate, with no areas having surplus topsoil moisture.

Subsoil moisture was rated as 24% very short, 39% short, and 37% adequate, with no areas having surplus subsoil moisture as we are dealing with both long-term and short-term dryness from the summer drought and fall drought separated by the flooding rains of late September.



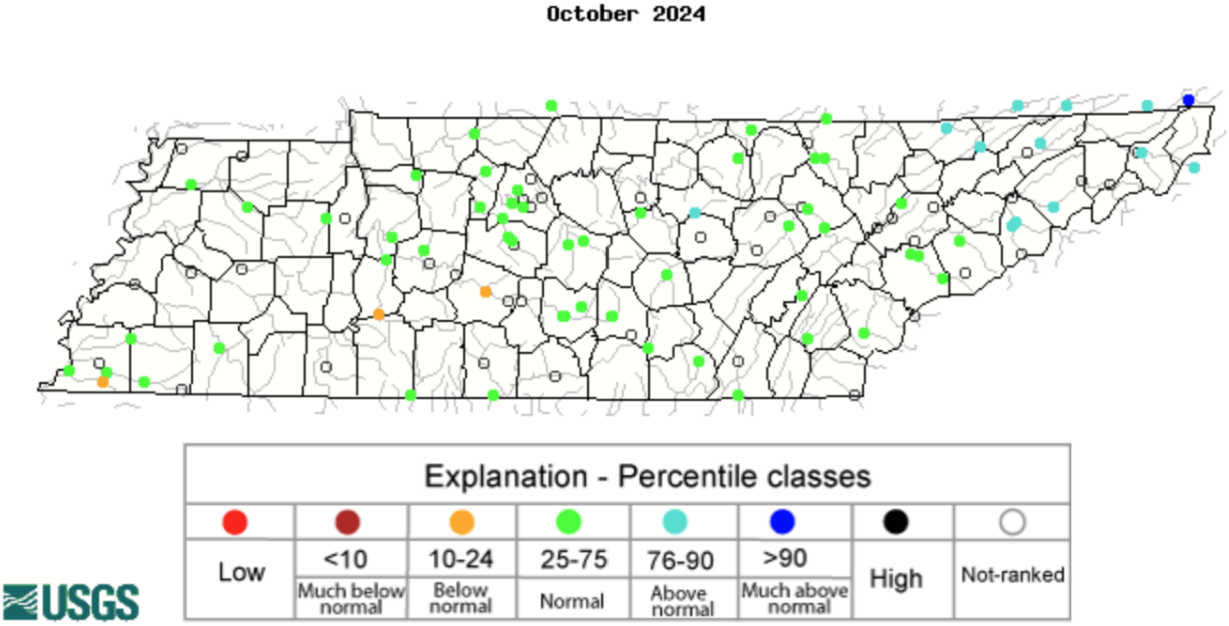


Streamflow:

Averaged over the month of October, most stream gauges reported flow levels in the normal range (25th to 75th percentile range), with stream gauges in Northeast Tennessee averaging above normal due to higher flow in the beginning of the month from Helene. A few gauges in southern Middle Tennessee and

southern West Tennessee averaged below normal for the month, where rainfall from Helene was lower and above average temperatures helped to reduce water resources.

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

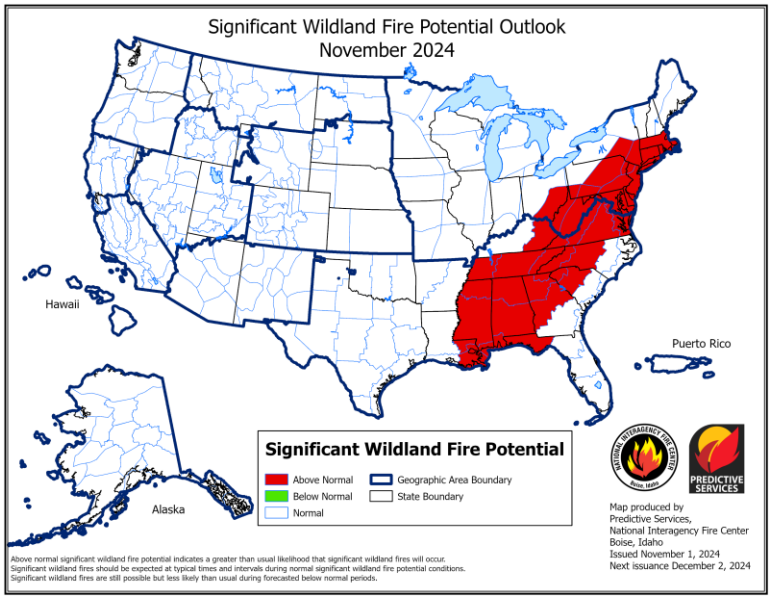


Miscellaneous:

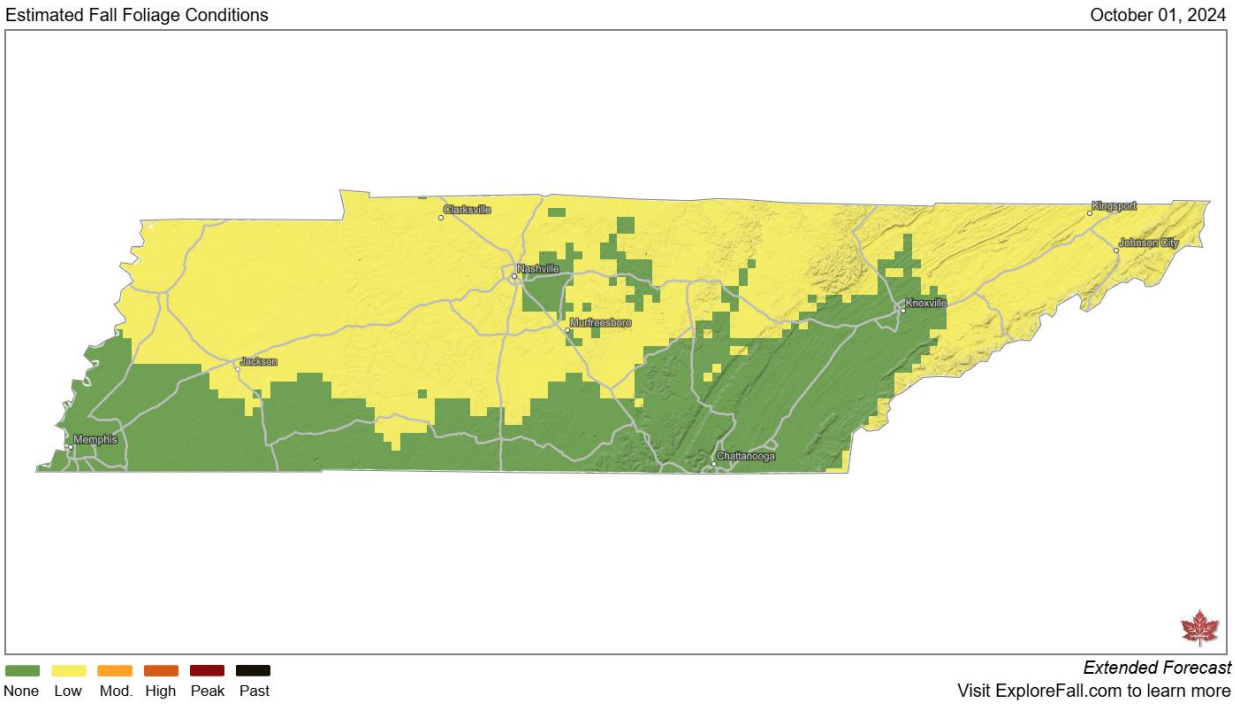
Crop Conditions from USDA: Corn, tobacco, and fall hay harvests were completed over the course of October, with soybeans and cotton harvest still ongoing by the end of the month. In East Tennessee flood and wind damage from Helene was assessed to crops and barns in the first week of October. Summer drought and heat followed by October's return to dry conditions have negatively impacted yields and quality for corn and soybeans. Cattle producers were also severely affected by drought conditions across the state this year, with ponds and streams drying up, having to feed hay during the summer and fall, and now culling herds early to reduce strain heading into winter. Dry soil conditions have also slowed progress in planting for winter wheat and other fall seedings, although in the last week of October the percent of winter wheat planted caught up to and surpassed the 5-year average percentage for this week of the year.

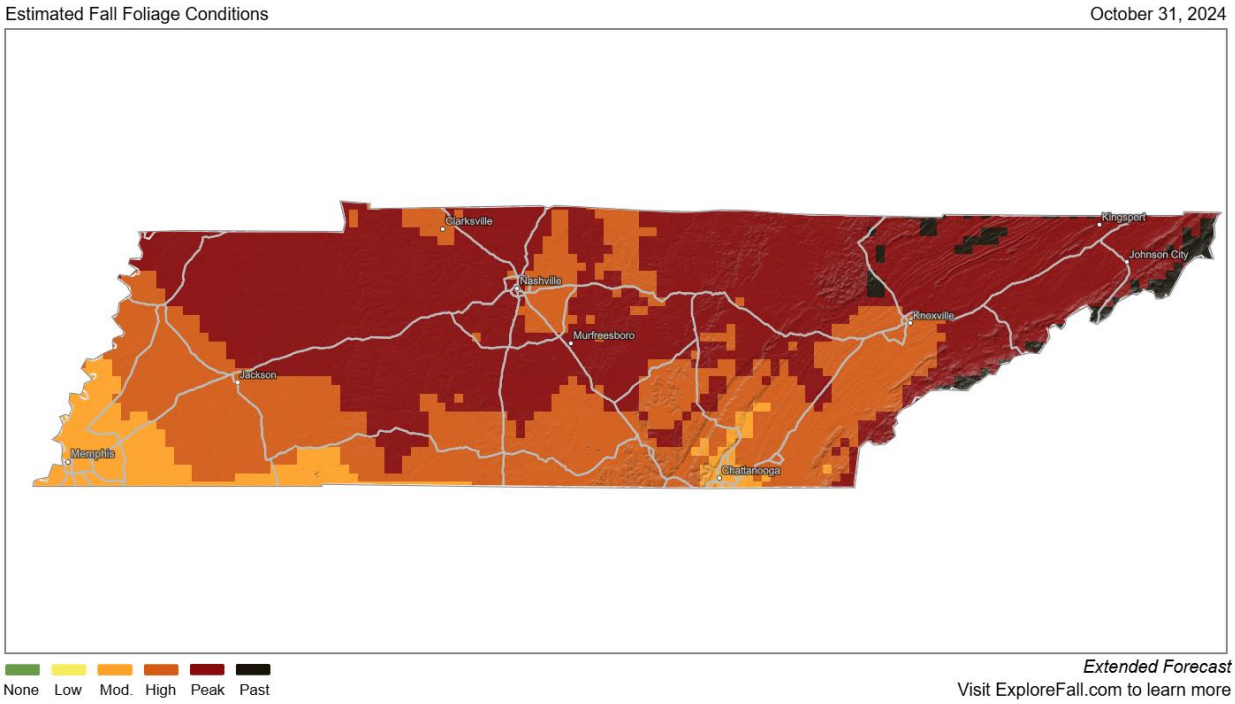
CROP PROGRESS					CONDITION					
Item	This Week	Last Week	2023	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
	Percent					Percent				
Corn – Harvested	96	94	91	93	Cotton	16	19	28	31	6
Cotton – Bolls Opening	99	97	97	97	Pasture	18	33	35	13	1
Cotton – Harvested	66	53	57	51	Winter Wheat	4	8	22	52	14
Soybeans – Harvested	77	69	69	62						
Winter Wheat – Planted	60	42	45	52						
Winter Wheat – Emerged	30	20	22	29						

Fire Danger: The Interagency Fire Center's significant wildfire potential outlook for November shows all of Tennessee and surrounding regions in Alabama, Mississippi, Georgia, North Carolina, and eastern Kentucky with above normal fire potential. This is likely due to the lack of rain over October paired with continued warm days producing very low relative humidity conditions for this time of the year. Leaf litter and storm debris can also dry out adding fuel for potential fires in the coming month.

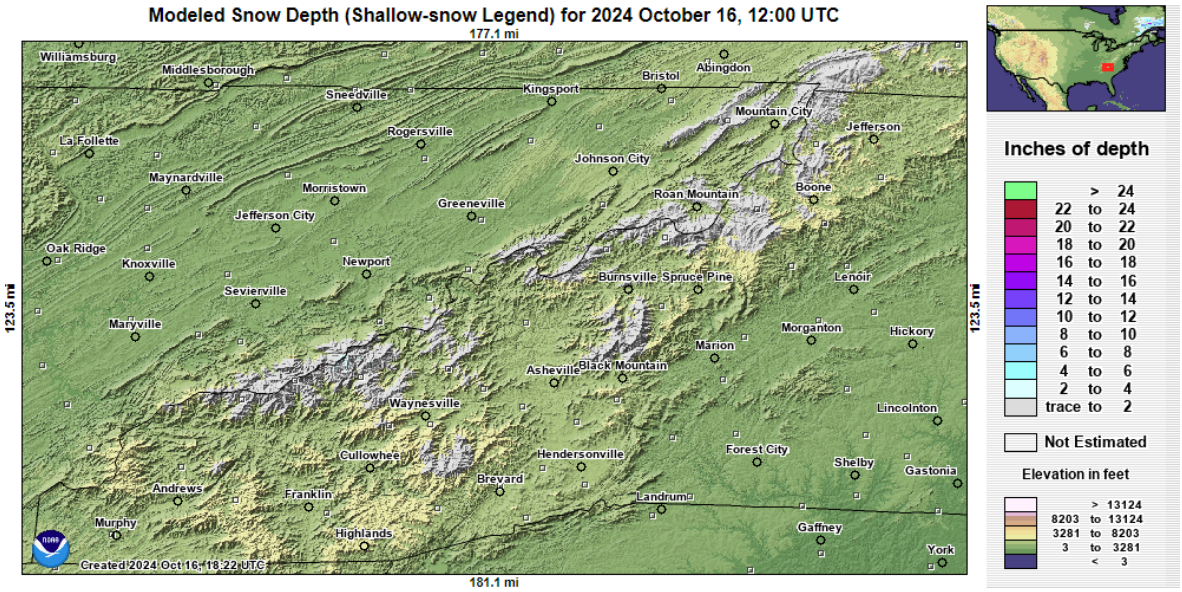


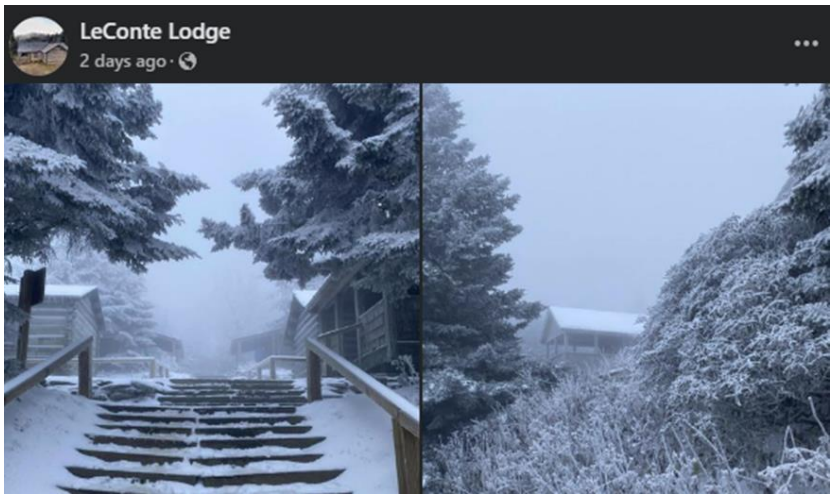
Fall Foliage: Despite drought stress causing some trees to drop their leaves early, rainfall in September, combined with cooler nights and warm sunny days, led to a decent fall foliage season across many areas of the state. Maps from Explore Fall show that in the beginning of the month low levels of fall color were detected in northern sections of East Tennessee and the Cumberland Plateau, most of Middle Tennessee and northern portions of West Tennessee. By Halloween the higher elevations of the mountains were passed peak while many areas across the state were showing high color or peak color. With only areas around Chattanooga and Memphis still in the moderate color phase.





Snow: There was one day in October with mountain snowfall on October 16, generally in locations that were above 4,000 ft in elevation. However, only the Mt. LeConte and the Newfound Gap COOP stations reported measurable snowfall in Tennessee. Mt. LeConte set a daily snowfall record with 2.99-inches on October 16, 2-inches above the previous daily record set in 2023. This also ties with last year for the 2nd earliest snowfall in the station's 37-year weather history, behind only 2010's first snowfall measured at the Mt. LeConte station on October 4.





Storm Reports:

There were no severe storm reports (tornado, winds, or hail) in Tennessee during October 2024.

CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center monthly outlooks for November show that all of Tennessee is likely to have above normal temperatures and equal chances for normal, above normal, or below normal precipitation.