

October 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:

October 2022 was cooler than normal across the state, compared to the 1991-2020 30-year climate normals. The Cumberland Plateau and East Tennessee saw the biggest difference, with some areas having a mean temperature for the month that was 4-6°F cooler than normal. This was mainly due to a strong cold spell in the middle part of the month that brought freezing conditions, record-setting cold, and even a bit of snow and sleet to parts of the state. Through the month, there were 52 daily records set for coldest low temperature, including 15 at weather stations with at least a 100-year reporting history. In addition to record low temperatures, there were 25 daily records set for coldest high temperature during the month, including 9 at weather stations with at least a 100-year history. Mt. LeConte smashed the previous record for coolest high temperature on October 19, with a reported high of only 18°F. The previous record was 40°F (set in 1997), 22-degrees higher! Two weather stations in Great Smoky Mountains National Park set records for the coolest high temperature ever recorded in the month of October on the 19th with 18°F at Mt. LeConte and 24°F at Newfound Gap.

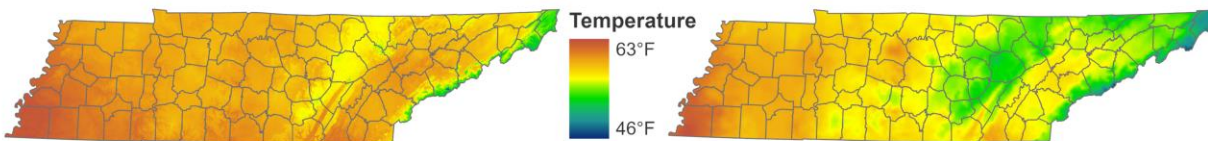


October 2022 Mean Temperature

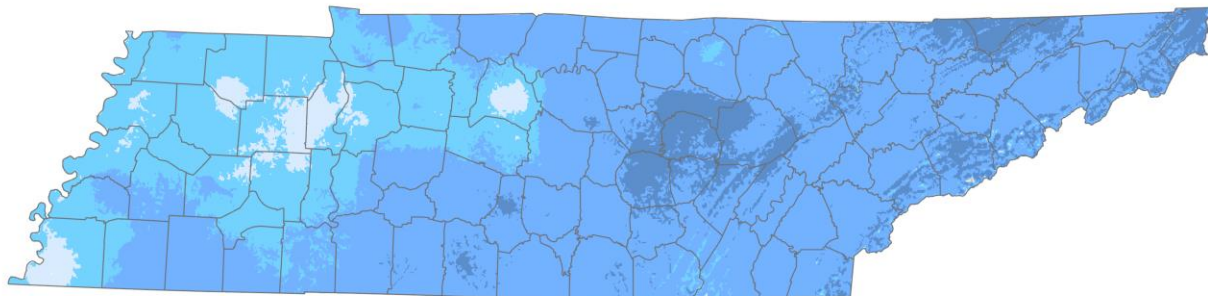


Normal Temperatures

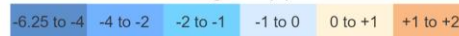
Observed Temperatures



Departure from Normal Temperature



Degrees (F)



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	63.2
SHILOH NMP TENNESSEE	RAWS	60.8
MEMPHIS WFO	WBAN	60.7
DYERSBURG MUNICIPAL AIRPORT	WBAN	60.6
NASHVILLE INTL AP	WBAN	60.6

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	41.5
NEWFOUND GAP	COOP	48.3
ROAN MOUNTAIN 3SW	COOP	48.4
MOUNTAIN CITY 2	COOP	49.3
COALMONT	COOP	51.1

Monthly Precipitation Summary:

October brought drier than normal conditions to almost all areas of Tennessee; coming on the heels of a mostly drier than normal September, this set the state up for rapid expansions in drought during the month. Rainfall totals of 2-3 inches were common in the southern half of West Tennessee and in parts of Middle Tennessee, which were the driest areas of the state last month. This led to improvements or no change in drought conditions for these areas. The driest areas of the state shifted to East Tennessee in October, and some weather stations in this region of the state recorded less than 1-inch of rain during the month. Despite the drier than normal conditions, there were a few rounds of heavy rains during October, especially in the western half of the state, which produced 11 daily rainfall total records during the month. A strong cold front during the middle of the month even brought the first taste of winter weather to Tennessee, with some sleet and snow reported on the Cumberland Plateau and in East Tennessee on the 18th and 19th.

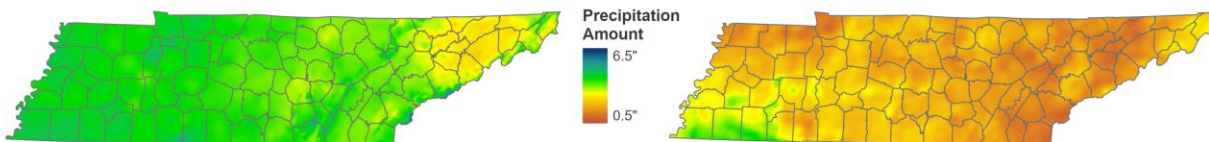


October 2022 Total Precipitation

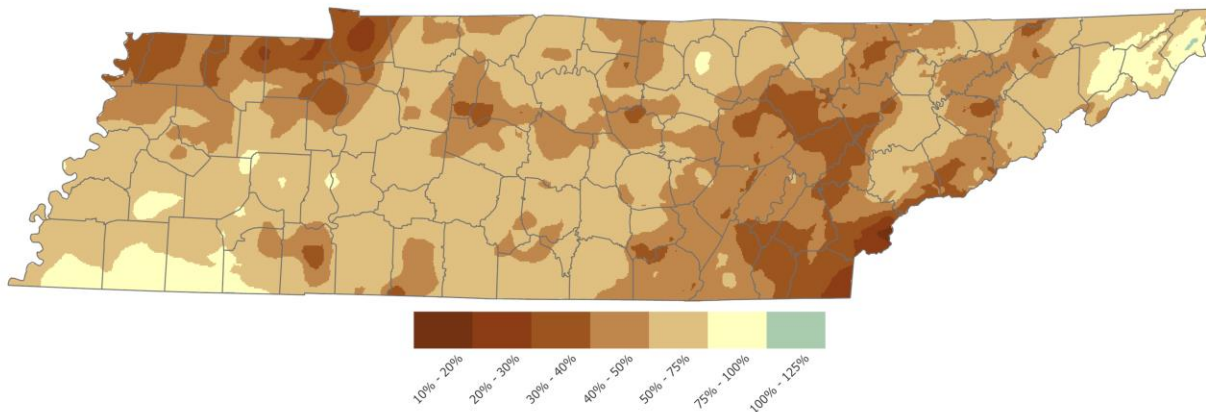


Normal Precipitation

Observed Precipitation



Percent of Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
MEMPHIS INTERNATIONAL AP	WBAN	4.82
MEMPHIS WFO	WBAN	3.71
NEWFOUND GAP	COOP	3.41
MEMPHIS 12.0 SE	CoCoRaHS	3.34
SAVANNAH 6 SW	COOP	3.18

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
CLINTON 4.9 S	CoCoRaHS	0.26
CLEVELAND 1.2 W	CoCoRaHS	0.44
KNOXVILLE 5.5 W	CoCoRaHS	0.46
BULLS GAP 3.6 W	CoCoRaHS	0.47
WHITE PINE 2.0 NE	CoCoRaHS	0.47

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	74.5	51.9	63.2	-1.4	85	10/12	35	10/19	4.82	+0.84	121%
Jackson	73.1	44.1	58.6	-2.1	85	10/12	28	10/20	2.40	-1.23	66%
Clarksville	73.3	44.9	59.1	-0.2	86	10/12	30	10/20	2.26	-1.87	55%
Nashville	73.3	48.0	60.6	-1.1	85	10/6	33	10/20	1.38	-1.98	41%
Chattanooga	73.0	46.1	59.6	-3.1	83	10/15	31	10/20	1.63	-1.96	45%
Crossville	65.1	40.9	53.0	-3.4	74	10/15	26	10/20	1.18	-1.96	38%
Knoxville	70.2	44.1	57.1	-3.2	83	10/12	31	10/20	1.98	-0.83	70%
Bristol	68.3	40.2	54.2	-3.1	79	10/15	27	10/20	0.84	-1.68	33%

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
JACKSON EXP STA	COOP	87	13
AMES PLANTATION	COOP	86	13
UNION CITY	COOP	86	28
DECATURVILLE	COOP	86	7
CAMDEN TOWER TENNESSEE	RAWS	86	6
CLARKSVILLE OUTLAW AP	WBAN	86	12
DECATUR 7NE	COOP	85	16
CAMDEN	COOP	85	7
TENNESSEE RIDGE	COOP	85	12
NASHVILLE BERRY FIELD	COOP	85	7
SHILOH NMP TENNESSEE	RAWS	85	12
MEMPHIS INTERNATIONAL AP	WBAN	85	12
JACKSON MCKELLAR- SIPES AP	WBAN	85	12
MEMPHIS WFO	WBAN	85	13
NASHVILLE INTL AP	WBAN	85	6

Nine stations tied for the 7th hottest temperature (85°F)

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
MT LCONTE	COOP	12	20
MILAN EXP STN	COOP	18	21
NEWFOUND GAP	COOP	19	19
MC MINNVILLE	COOP	20	20
GAINESBORO	COOP	21	20
MOUNT PLEASANT 1N	COOP	22	14
BETHPAGE 1 S	COOP	22	20
CROSSVILLE EXP STN	COOP	23	21
MOUNTAIN CITY 2	COOP	23	21
ONEIDA	COOP	23	21
COALMONT	COOP	23	21
GLADEVILLE	COOP	23	21
CROSSVILLE 7 NW	WBAN	23	20

Six stations tied for the 8th coldest temperature (23°F)

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	63.2
SHILOH NMP TENNESSEE	RAWS	60.8
MEMPHIS WFO	WBAN	60.7
DYERSBURG MUNICIPAL AIRPORT	WBAN	60.6
NASHVILLE INTL AP	WBAN	60.6
CAMDEN TOWER TENNESSEE	RAWS	60.3
SAVANNAH 6 SW	COOP	60
JACKSON EXP STA	COOP	59.9
NASHVILLE BERRY FIELD	COOP	59.8
BROWNSVILLE	COOP	59.7

Cooltest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	41.5
NEWFOUND GAP	COOP	48.3
ROAN MOUNTAIN 3SW	COOP	48.4
MOUNTAIN CITY 2	COOP	49.3
COALMONT	COOP	51.1
CROSSVILLE EXP STN	COOP	51.3
ONEIDA	COOP	51.4
NEWCOMB	COOP	51.5
CROSSVILLE 7 NW	WBAN	51.5
GATLINBURG 2 SW	COOP	51.8

Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
MEMPHIS INTERNATIONAL AP	WBAN	4.82
MEMPHIS WFO	WBAN	3.71
NEWFOUND GAP	COOP	3.41
MEMPHIS 12.0 SE	CoCoRaHS	3.34
SAVANNAH 6 SW	COOP	3.18
AMES PLANTATION	COOP	3.1
SOMERVILLE 1.3 E	CoCoRaHS	3.08
ROAN MOUNTAIN 7.1 W	CoCoRaHS	2.98
LAKELAND 4.6 SE	CoCoRaHS	2.96
CLARKSVILLE NO.2	COOP	2.94

Driest Stations (lowest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
CLINTON 4.9 S	CoCoRaHS	0.26
CLEVELAND 1.2 W	CoCoRaHS	0.44
KNOXVILLE 5.5 W	CoCoRaHS	0.46
BULLS GAP 3.6 W	CoCoRaHS	0.47
WHITE PINE 2.0 NE	CoCoRaHS	0.47
KNOXVILLE 5.7 NNW	CoCoRaHS	0.48
OAK RIDGE 8.1 ENE	CoCoRaHS	0.51
MARYVILLE 3.4 ESE	CoCoRaHS	0.52
SHELBY BOTTOMS NATURE CENTER	COOP	0.53
OAK RIDGE 3.1 NNW	CoCoRaHS	0.59

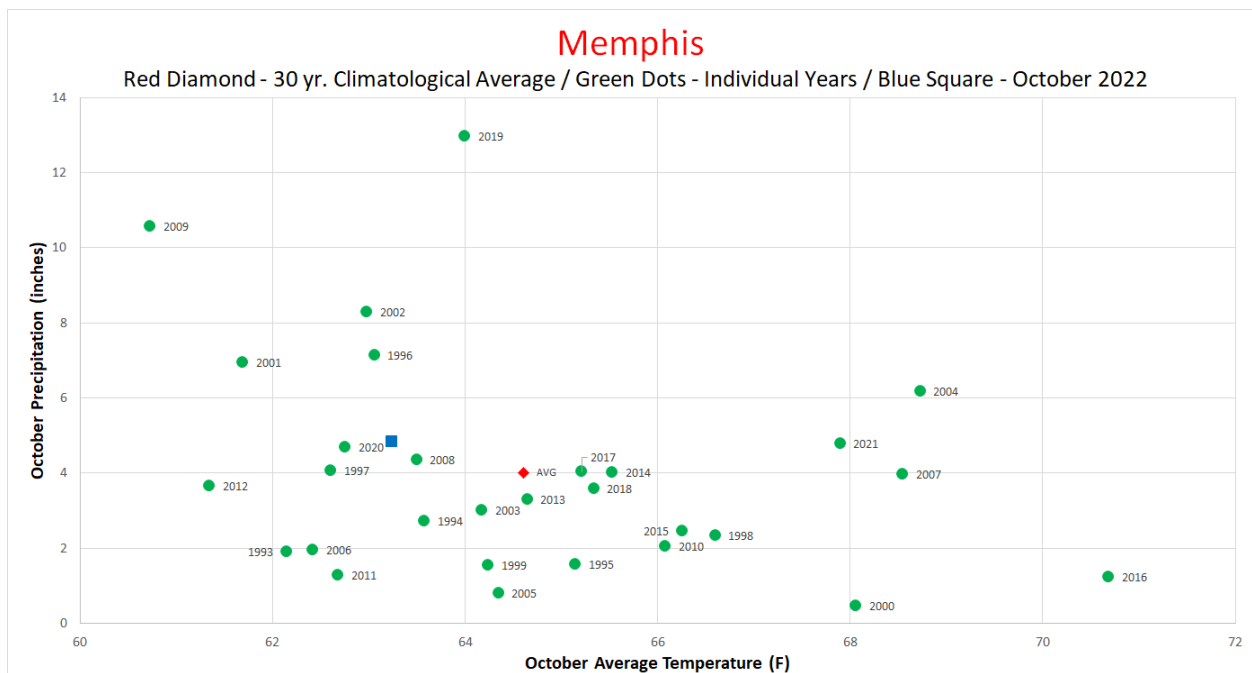
Snowiest Stations (highest snowfall accumulations)

Name	Station Type	Total Snowfall (in)
JAMESTOWN 12.9 S	CoCoRaHS	T
CLARKRANGE 6.0 NE	CoCoRaHS	T
NEWCOMB	COOP	T

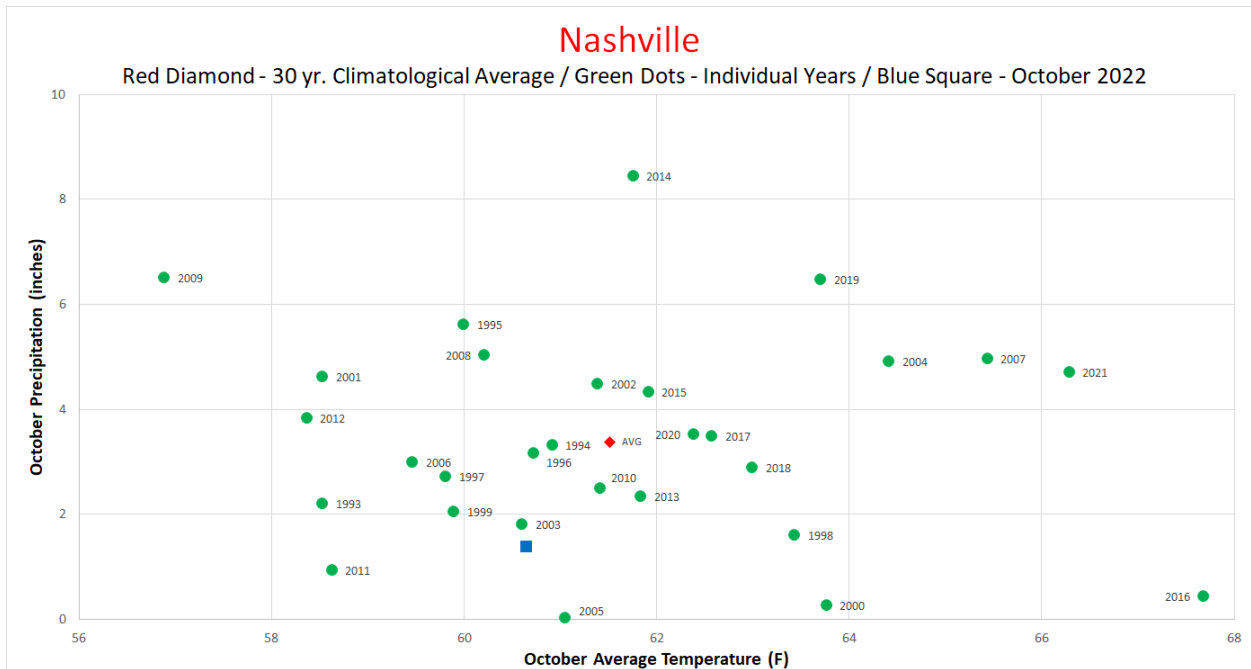
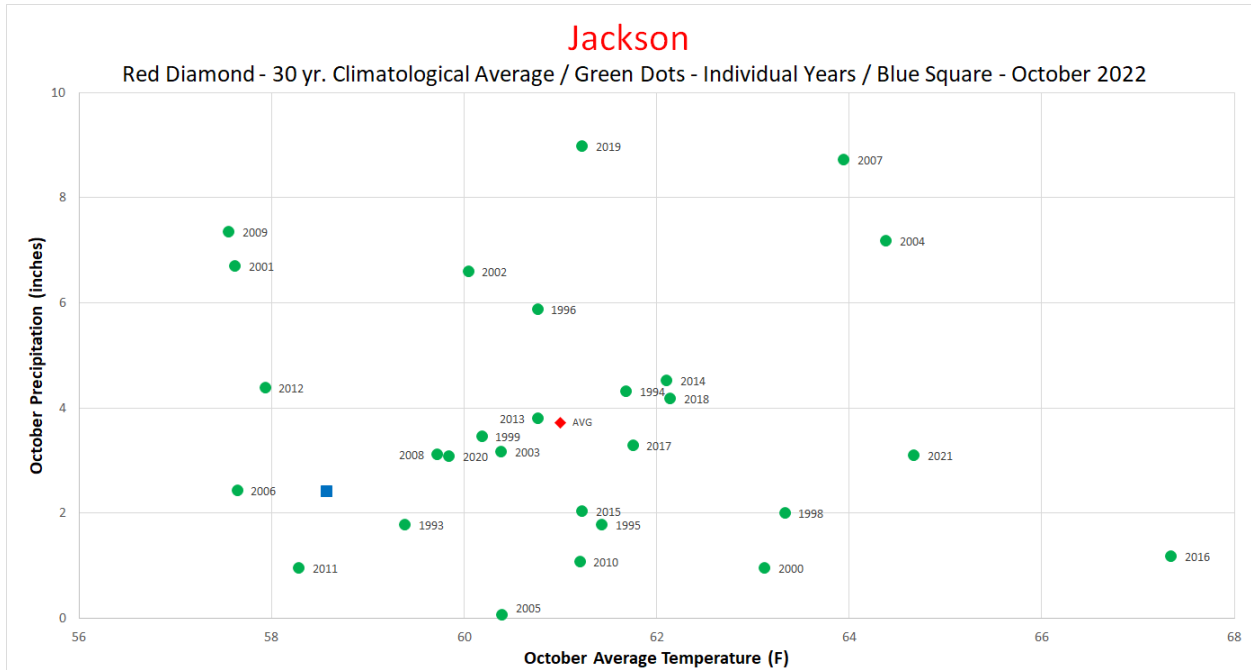
T = Trace (less than 0.1")

The Month in Comparison:

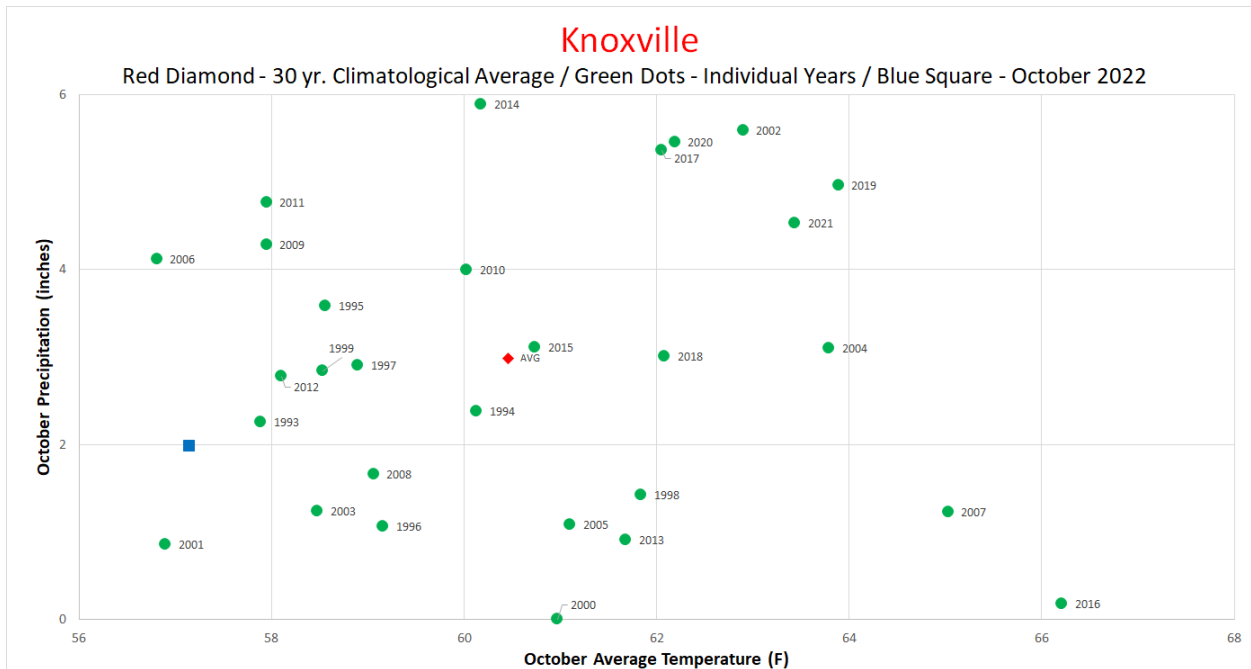
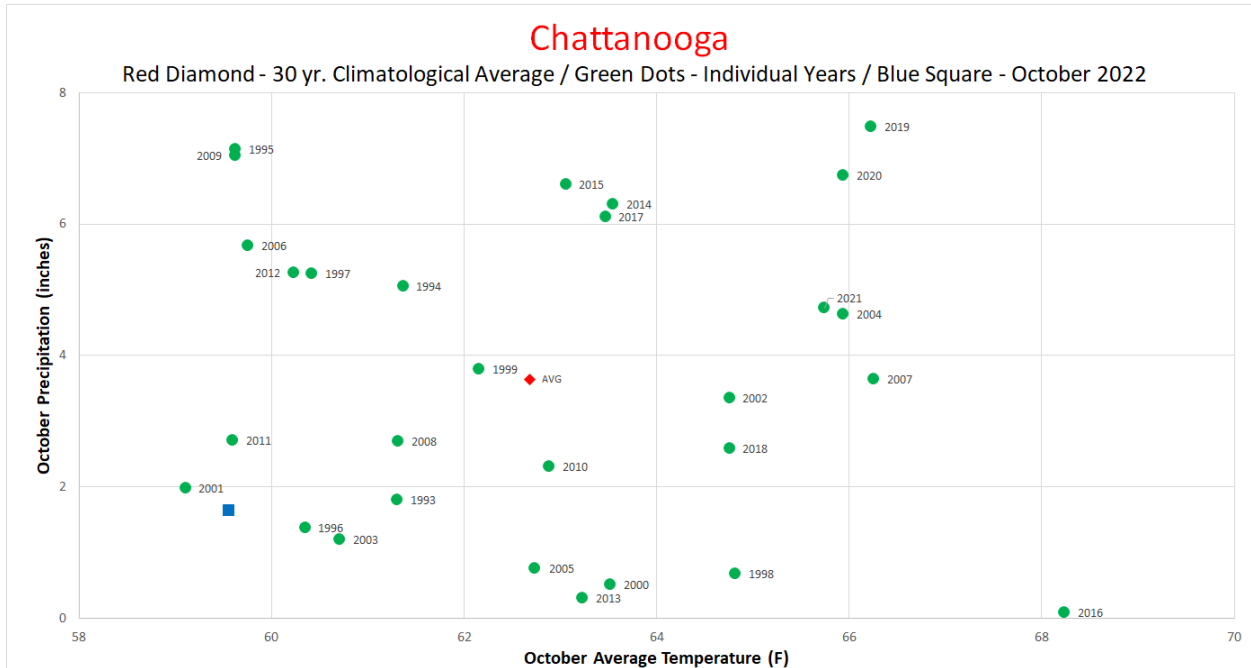
Comparing the average temperature and total rainfall at select automated weather stations located at airports across the state for October 2022 to the conditions of October over the past thirty years, Memphis was the only airport that reported above average rainfall. Bristol/Tri-Cities tied for the 4th driest October of the past thirty years, and the 5th driest October at Nashville; however, looking at the full weather record for the cities it was not a top-ten driest October at either location. All airport weather stations were cooler than the average of the past thirty years. It was the second coldest October of the past thirty years at Chattanooga and Bristol/Tri-Cities and third coldest at Knoxville, but looking at the full weather history for each city it was not a top-ten coldest October for these stations.

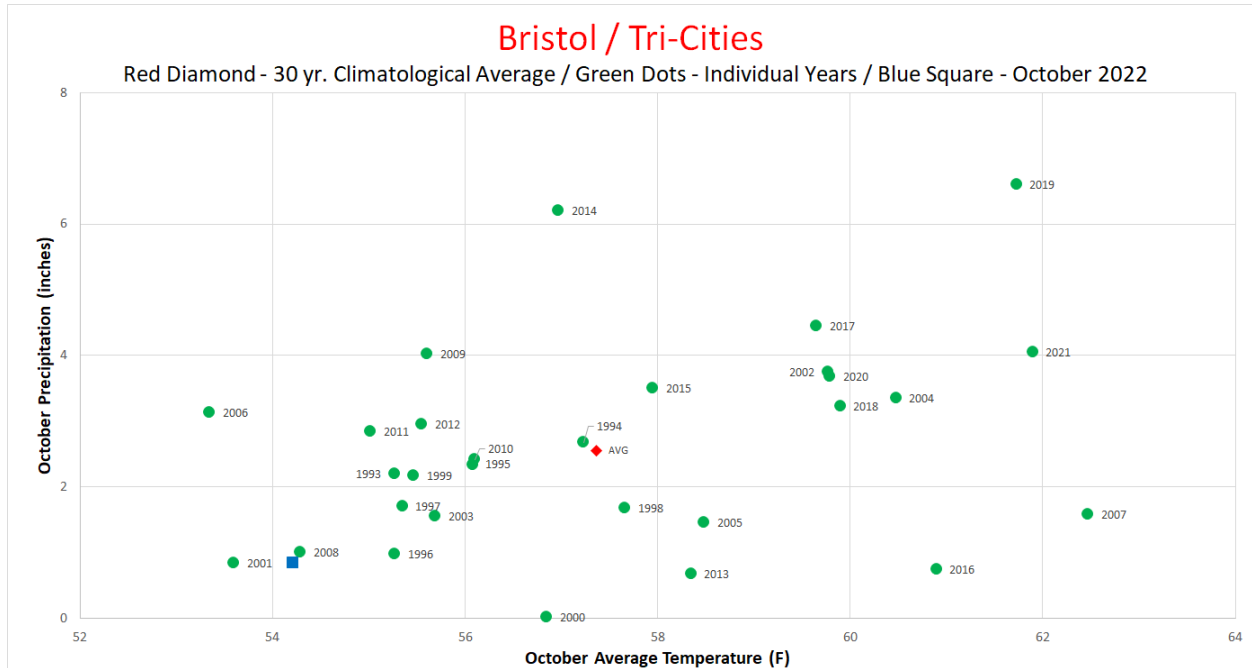


October 2022 Tennessee State Climate Summary



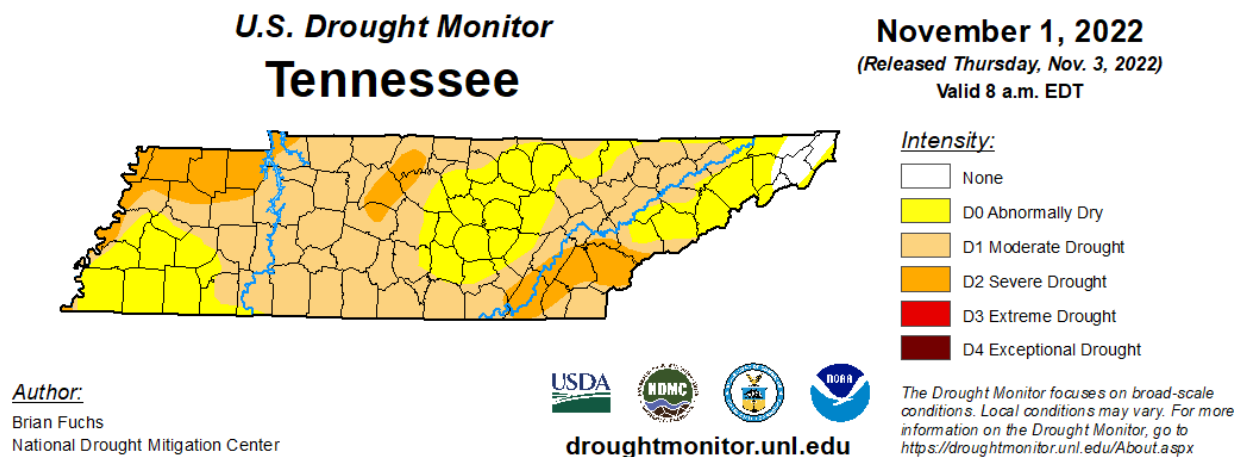
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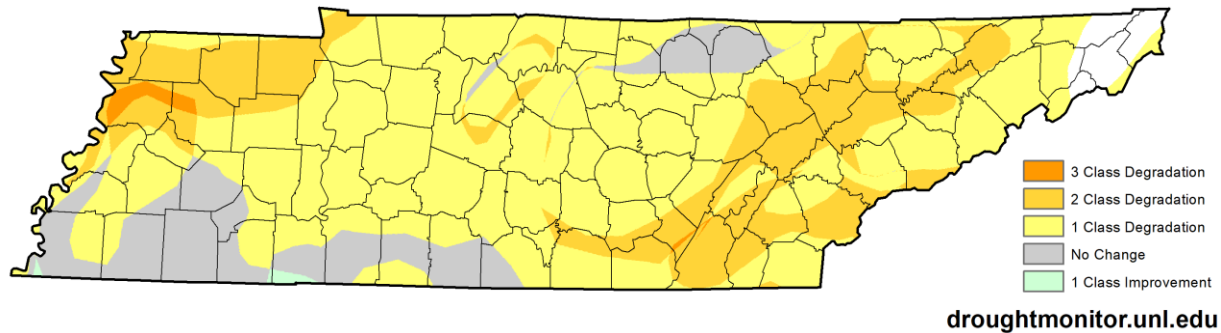
Drought Monitor:

The U.S. Drought Monitor from November 1, shows that most of Tennessee is experiencing abnormally dry or drought conditions. Only 2% of the state’s area was clear on the Drought Monitor map; this was a decrease of 35% compared to the Drought Monitor map from October 4. On November 1, 14.5% of the state was shown in Severe Drought (D2) and 51.3% of the state was shown with Moderate Drought (D1). Most areas of Tennessee saw a 1- to 2-category worsening of drought conditions through October.



November 1, 2022
 compared to
 October 4, 2022

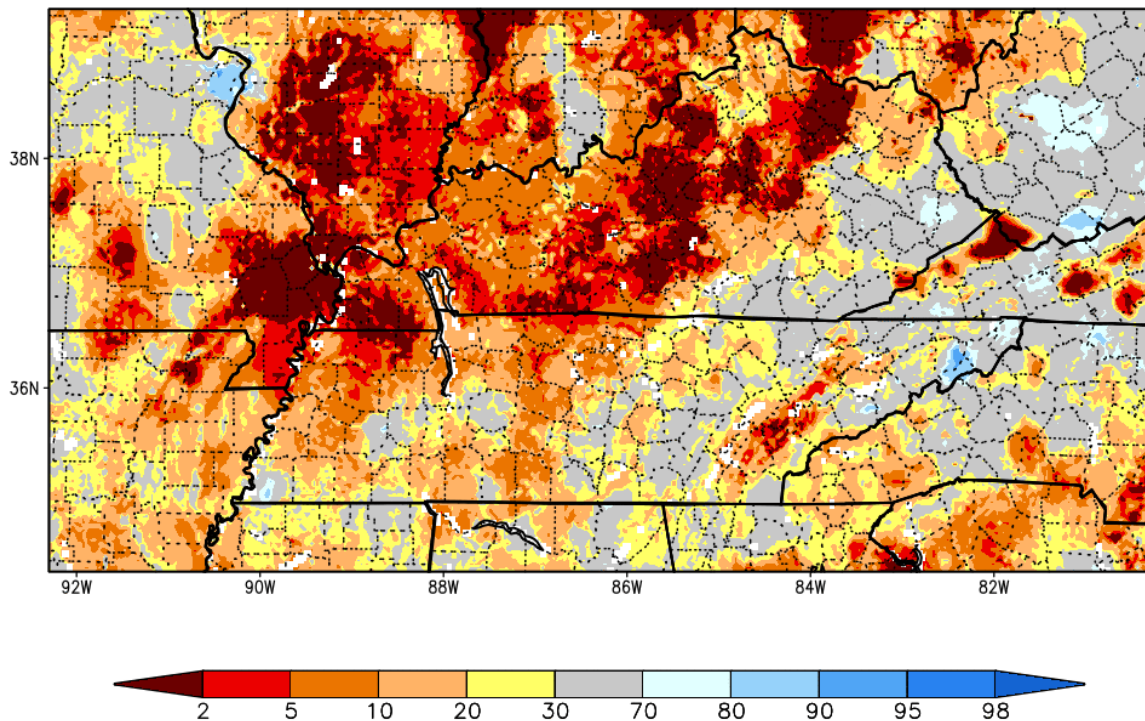
U.S. Drought Monitor Class Change - Tennessee
 4 Week



Soil Moisture:

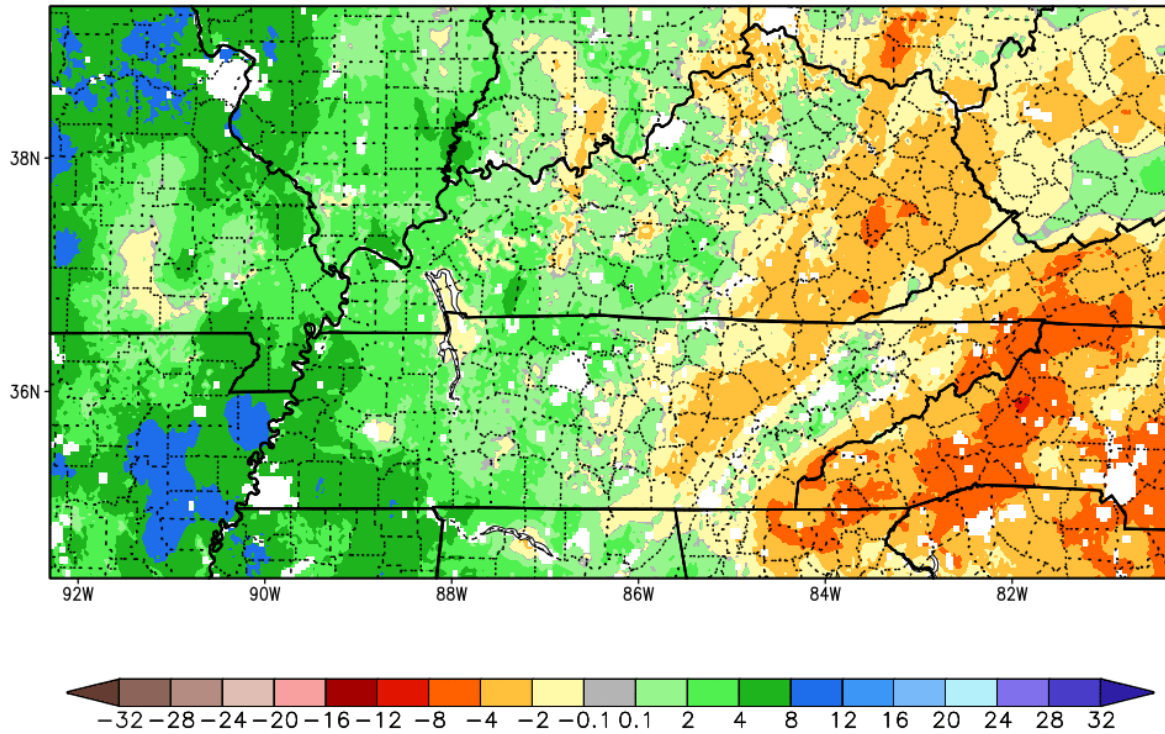
The NASA SPoRT Land Information System showed that the majority of the state had below normal soil moisture levels by the end of October, with the northwest quarter of the state and the southern Tennessee Valley in East Tennessee having the lowest soil moisture percentiles. However, the western half of the state and some areas of the Tennessee Valley saw a minor increase in soil moisture levels (2-8%) over the month. The USDA crop weather report for Tennessee released on October 31 rated topsoil moisture as 15% very short, 40% short, 43% adequate, and 2% surplus; subsoil moisture was rated 15% very short, 43% short, 41% adequate, and 1% surplus.

SPoRT-LIS 0-200 cm Soil Moisture percentile valid 31 Oct 2022



****NOTE****
****Experimental****

1–Month Difference in Column Relative Soil Moisture (%) valid 12z 31 Oct 2022



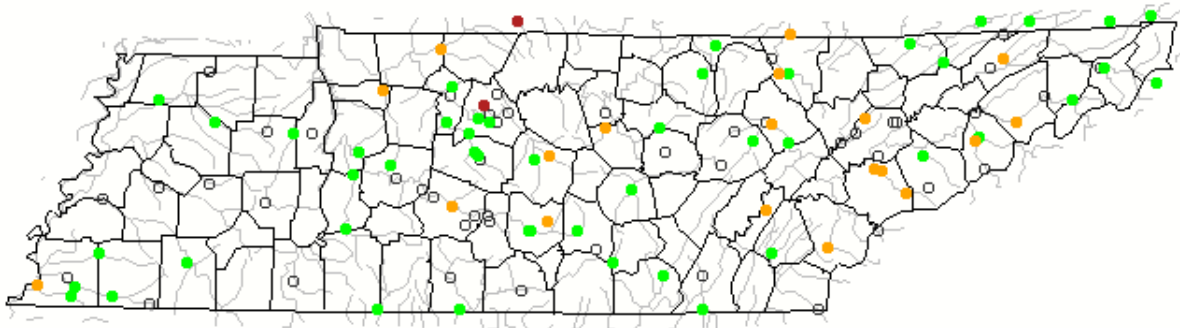
****NOTE****
****Experimental****

Streamflow:

Streamflow levels averaged over October show a mixed pattern of streams in the normal percentile range (25th-75th) and below normal (10th-24th) percentiles, however most below normal stream gauges were found in Middle and East Tennessee.

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

October 2022



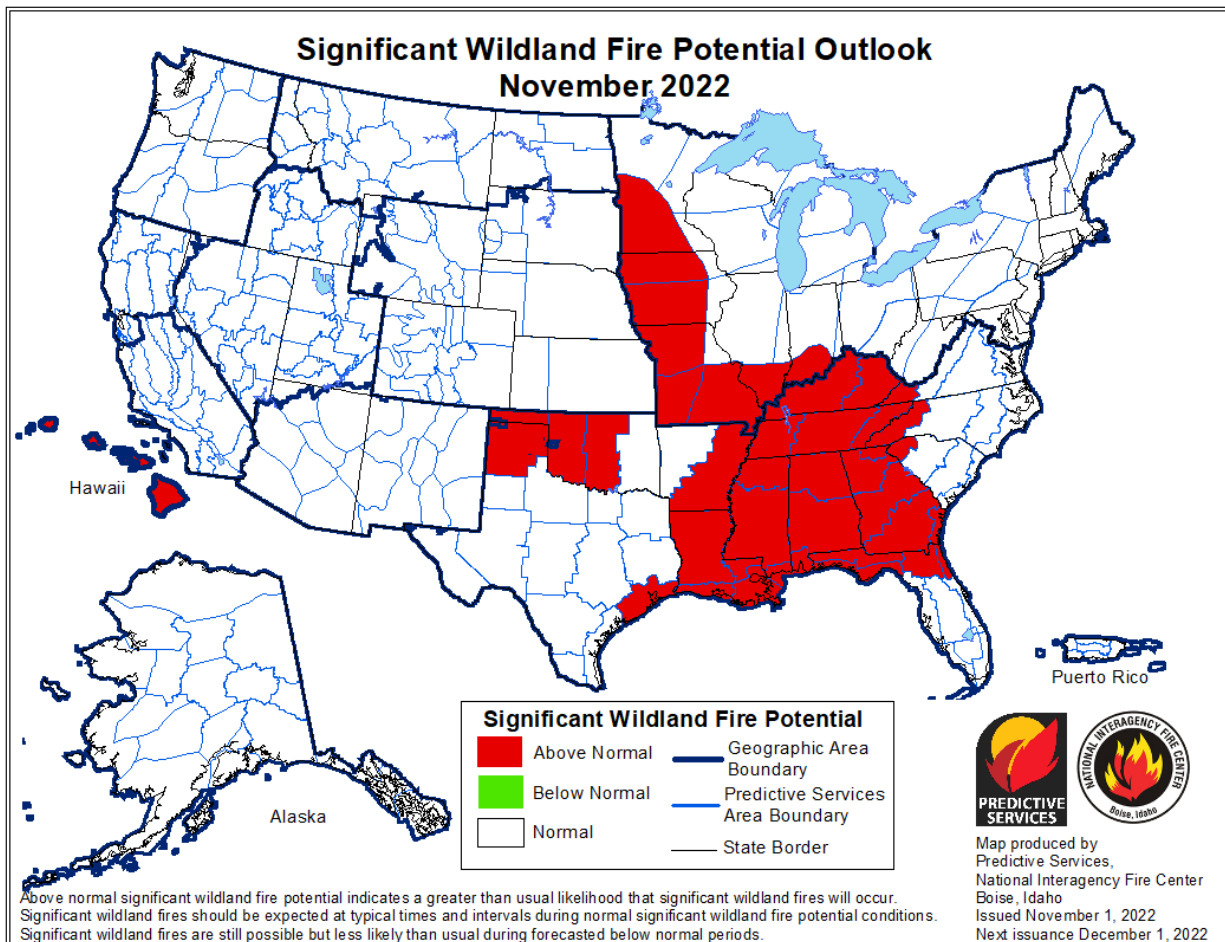
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Miscellaneous:

Crop Conditions from USDA: Cool and dry weather were major concerns for pastures through October, with 40% of pastures reported in Poor or Very Poor condition at the end of the month. Many livestock producers were having to feed hay already and were worried about having enough hay to last through the winter. The Corn harvest finished up during October, and Cotton harvesting was ahead of the 5-year average. The cotton crop is looking good, with 51% reported in Good or Excellent condition. Dry conditions in the beginning of the month had many farmers waiting to plant winter wheat but the rains in the middle of the month prompted planting, and by the end of the month the amount of winter wheat planted was ahead of the 5-year average.

CROP PROGRESS	This Week	Last Week	2021	5 Year Avg.	CONDITION					
					Item	Very Poor	Poor	Fair	Good	Excellent
	Percent					Percent				
Corn – Harvested	97	94	90	95	Cotton	5	10	34	44	7
Cotton – Bolls Opening	99	96	93	99	Winter Wheat	1	5	49	38	7
Cotton – Harvested	65	51	40	58	Pasture	12	28	39	20	1
Soybeans – Harvested	73	61	53	62						
Winter Wheat – Planted	63	46	58	57						
Winter Wheat – Emerged	36	20	36	35						

Fire Danger: With the persistently drier than normal fall, several wildland fires broke out in parts of Tennessee during October, but most were contained relatively quickly although a few grew to over 100-acres. Looking ahead to November the National Interagency Fire Center outlook for significant wildland fire potential shows all of Tennessee, as well as most surrounding regions with an above normal potential for significant wildland fires.

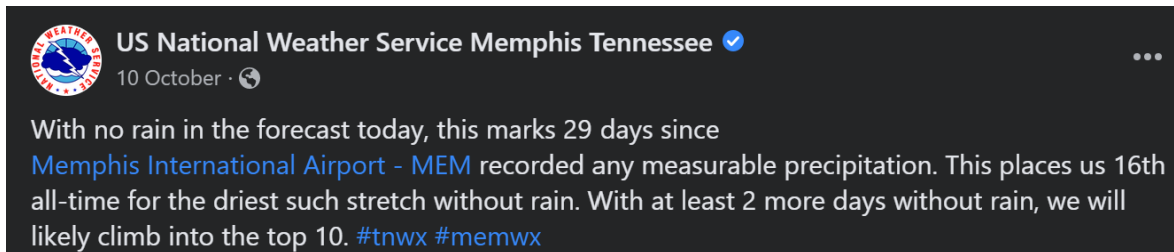


Fall Foliage: Cool conditions set the stage for a beautiful fall foliage season across the state. However, some areas had their colors muted because of the drier than normal conditions over the past two months. Most areas in the mountains peaked in mid-October with lower elevations around the state reaching peak towards the end of October.

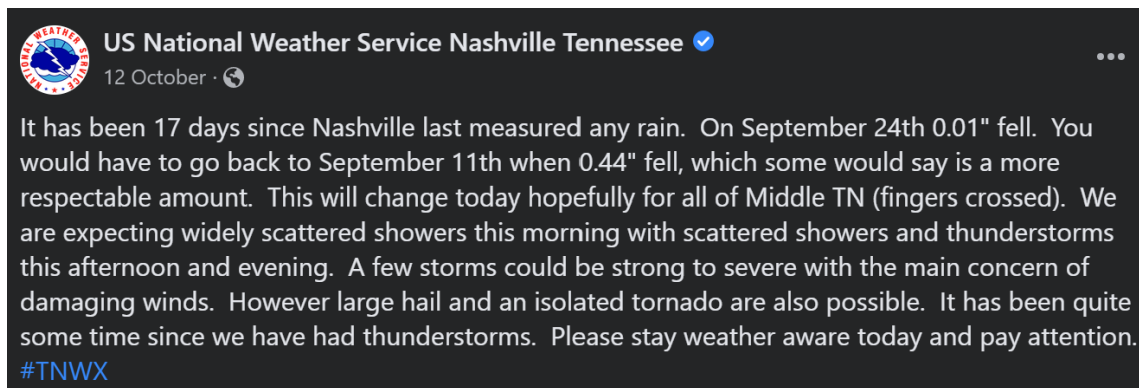
Story of the Month:

There were several major weather/climate stories impacting Tennessee this month including the spread of abnormally dry and drought conditions, record low water levels in the Mississippi River at Memphis, and record-setting cold in the middle of the month.

The current drought and abnormally dry conditions across Tennessee started with below normal rainfall over the past several months. The end of September and beginning of October were much drier than normal across most areas of the state. The weather station at Memphis International Airport went 31 days without measurable rainfall (from Sep. 11 to Oct. 11), making it the 3rd longest streak of no rainfall for the station, with records at the airport going back to 1940. Fall tends to be the driest season in Tennessee, and both longer precipitation-free streaks at Memphis (33-days in 1963 and 36 days in 1981) also centered around the Sep-Oct time period. Nashville had a similar dry spell from Sep. 12 to Oct.12, although the airport weather station did record 0.01” on September 24th so it was not completely rain free.

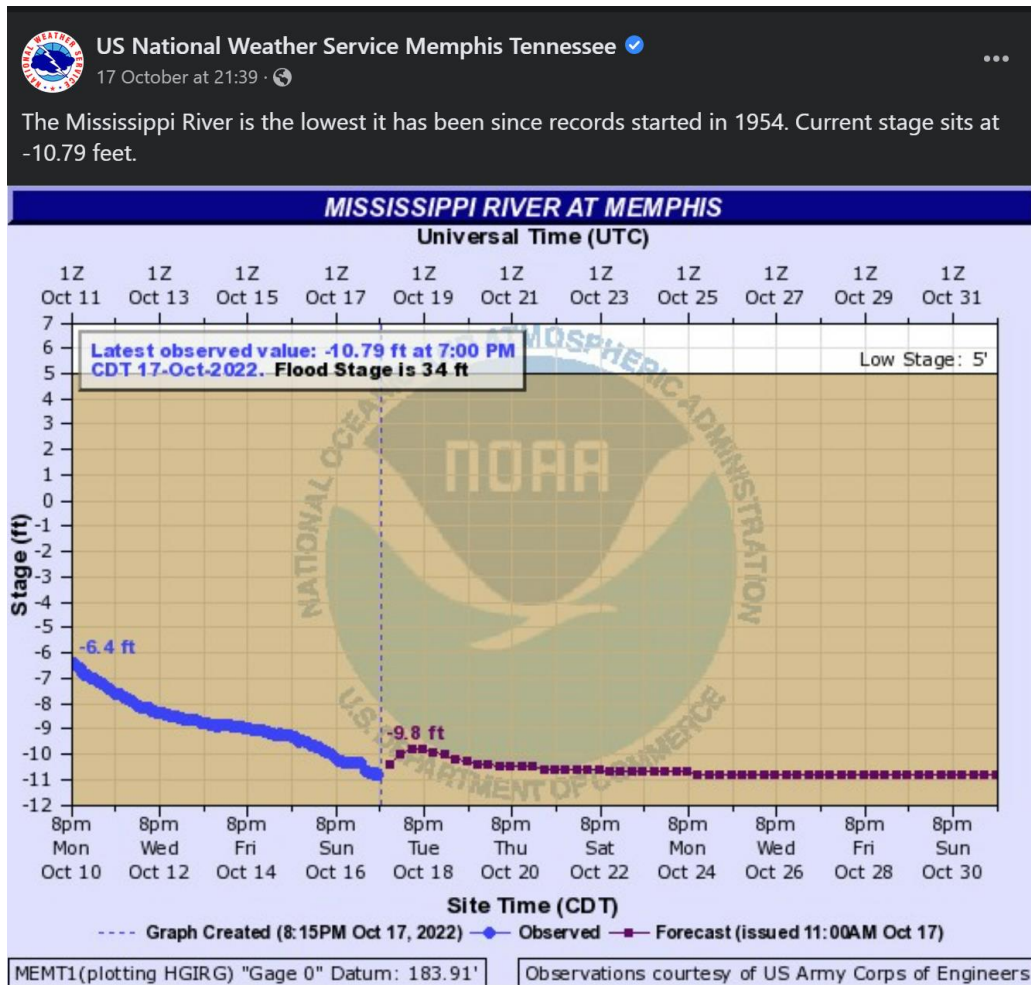


Post from the National Weather Service Memphis Office about the streak of rain-free days.

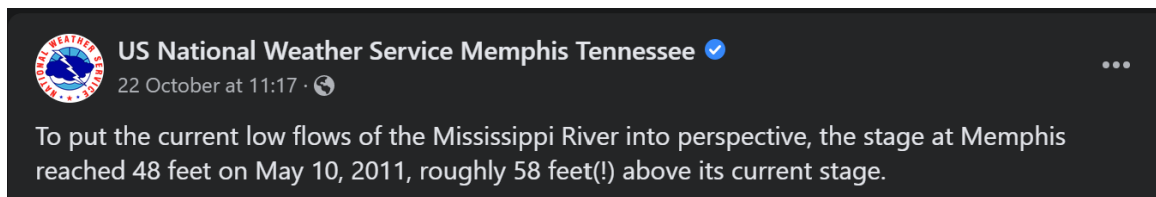


Post from the National Weather Service Nashville Office about the dry weather in Sep/Oct 2022.

In addition to drought conditions in Tennessee, widespread drought conditions including Extreme and Exceptional Drought (D3 & D4 on the U.S. Drought Monitor) throughout the upper Mississippi and Missouri River basins led to record low water levels in the lower Mississippi River. The USGS stream gauge on the Mississippi River at Memphis reached a record low stage (-10.79 ft) on October 17. The river continued to have near record low stages through October, and sections of the river had to be dredged to deepen the shipping lanes for barge traffic.




Post from the National Weather Service Memphis Office about the low water levels in the Mississippi River on October 17 including the USGS Hydrograph and forecast for the rest of October.



Post from the National Weather Service Memphis Office comparing the stage heights from high flow period of May 2011 to low flow heights this month.



Beyond the dry conditions and low water levels in the Mississippi River, the second major story impacting Tennessee this month was an early blast of wintry conditions in the third week of October, with October 18th being particularly cold, running more than 20°F cooler than normal for the date, and temperatures were more in line with an average January day for Tennessee. This surge of cold air brought freezing conditions across the state much earlier than normal, and even resulted in some reports of snow and sleet.

 US National Weather Service Memphis Tennessee ✓
18 October at 11:00 · 🌐

Much of the Mid-South will see their first fall freeze overnight tonight, much earlier than normal. This is only a few days shy of the earliest record fall freeze for Memphis ❄️🌨️

First Fall Freeze

	Earliest	Latest	Average
Memphis, TN	Oct 16, 1952	Dec 11, 1994	Nov 12
Jackson, TN	Oct 4, 1987	Nov 28, 2004	Oct 28
Jonesboro, AR	Oct 7, 1952	Dec 14, 1901	Nov 3
Tupelo, MS	Oct 3, 1974	Dec 2, 1946	Nov 4

@NWSMemphis   weather.gov/memphis

Post from the National Weather Service Memphis Office about average first freeze dates for their forecast area.

 US National Weather Service Morrystown Tennessee ✓
20 October at 10:35 · 🌐

The recent push of cold air proved to be the earliest of this magnitude in more than 15 years for most places, especially in Chattanooga. #tnwx #ncwx #vawx #mrwxw

Record-Breaking Temperatures

Chattanooga	Knoxville	Tri-Cities
<ul style="list-style-type: none"> 10/18 and 10/19: Earliest frost (36°F or lower) since 2006 Today: Earliest freeze since 1988 and tied with 1972 and 1981 for the 6th earliest on record Area-wide, temperatures on 10/18 in particular were 20+ degrees below normal and near the normal values in January. 	<ul style="list-style-type: none"> 10/18: Earliest freeze since 2006 10/18: Top 15 earliest freezes on record 10/18: Record low high temperature 	<ul style="list-style-type: none"> 10/18: Earliest freeze since 2015 10/18: Record low high temperature

*Note: Records for temperatures began in 1879 for Chattanooga, 1871 for Knoxville, and in 1938 for the Tri-Cities.

f NWSMorrystown  @NWSMorrystown

Post from the National Weather Service Morrystown Office about the early season freezes in East Tennessee.

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.

There was 1 day with severe storms reported in Tennessee with no tornados or severe hail reports, but 13 severe wind damage reports, sadly there was one fatality related to the severe winds.

October 12:



Wind:

Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
20:05	--	SALTILLO	HARDIN	35.38	-88.21	TREES AND POWERLINES DOWN ACROSS SALTILLO... PICKWICK... BIG IVY... AND GILLIS MILLS AREAS. (MEG)
20:33	--	LEXINGTON	HENDERSON	35.65	-88.39	LARGE TREE BRANCH DOWN CAUSING SOME ROOF DAMAGE TO A HOUSE AND ALSO TO A CAR. (MEG)
20:45	--	3 ESE BON AQUA	HICKMAN	35.93	-87.29	STEEPLE BLOWN OFF EAST HICKMAN BAPTIST CHURCH. (OHX)
20:57	--	1 SSW FAIRVIEW	WILLIAMSON	35.96	-87.14	GAS STATION AWNING DESTROYED BY WINDS NEAR WALMART IN FAIRVIEW. TSPOTTER REPORT. (OHX)
21:10	--	6 WNW FRANKLIN	WILLIAMSON	35.98	-86.93	*** 1 FATAL *** A TREE WAS BLOWN DOWN ONTO A VEHICLE ON OLD NATCHEZ TRACE KILLING A 22 YEAR OLD WOMAN. (OHX)
21:21	--	1 SW BRENTWOOD	WILLIAMSON	35.99	-86.8	AROUND 15 SCATTERED REPORTS OF TREES AND POWER LINES BLOWN DOWN WERE RECEIVED FROM FRANKLIN TO BRENTWOOD. (OHX)
21:32	--	2 ENE NASHVILLE	DAVIDSON	36.19	-86.75	TREE FELL ON A HOUSE IN EAST NASHVILLE NEAR MAS TACOS WITH SIDING DAMAGE ON THE HOUSE. (OHX)
21:43	--	6 WSW SUMMERTOWN	LAWRENCE	35.39	-87.4	SEVERAL TREES AND POWER LINES WERE BLOWN DOWN IN THE HENRYVILLE AREA. (OHX)

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Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
21:43	--	5 WSW GALLATIN	SUMNER	36.35	-86.53	TWO LANES BLOCKED BY FALLEN TREE AT THE INTERSECTION OF GALLATIN ROAD AND BIG STATION CAMP BLVD. TSPOTTER REPORT. (OHX)
21:57	--	4 S LAWRENCEBURG	LAWRENCE	35.19	-87.34	24 INCH DIAMETER MAPLE TREE DOWN ON GARAGE IN DUNN... SOUTH OF LAWRENCEBURG. (OHX)
22:57	--	4 W NORMANDY	BEDFORD	35.46	-86.33	TWITTER TSPOTTER REPORTS OF TREES BLOWN DOWN IN THE 300 BLOCK OF NORMANDY RD... ON HAWTHORNE HILL RD NEAR FLAT CREEK... AND ON HWY 82 NEAR HIMESVILLE. (OHX)
23:12	--	1 N MANCHESTER	COFFEE	35.48	-86.08	TREES FELL ON POWER LINES ON COLLEGE STREET AT THE INTERSECTION OF HWY 41 AND HWY 55. (OHX)
23:35	64	4 WNW MCMINNVILLE	WARREN	35.7	-85.84	AWOS STATION KRNC MCMINNVILLE AIRPORT. (OHX)

CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center outlooks for November indicate that all of Tennessee will be leaning towards a warmer than normal month, and that drier than normal conditions will continue, with a bit more confidence in the eastern half of the state for the dry pattern.

