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2019 November - Tennessee Monthly Climate Report

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November 2019 Tennessee State Climate Summary

Tennessee Climate Office * East Tennessee State University

Prepared by William Tollefson and Dr. Andrew Joyner

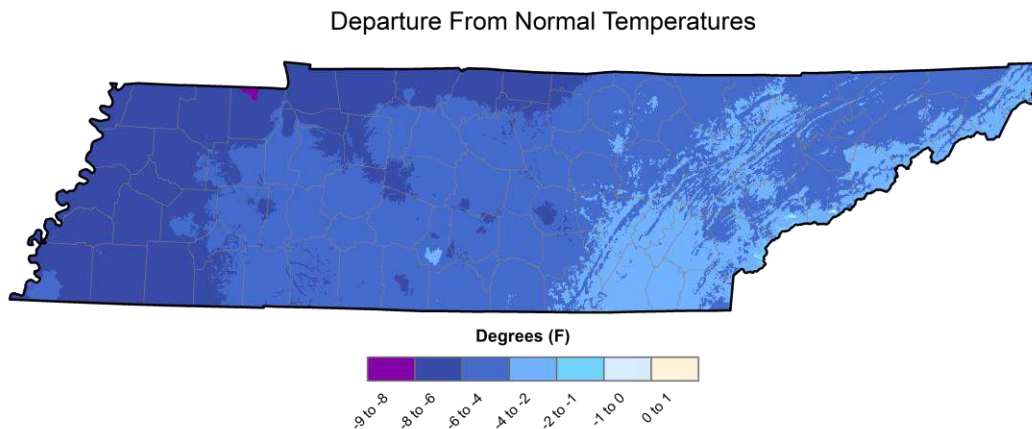
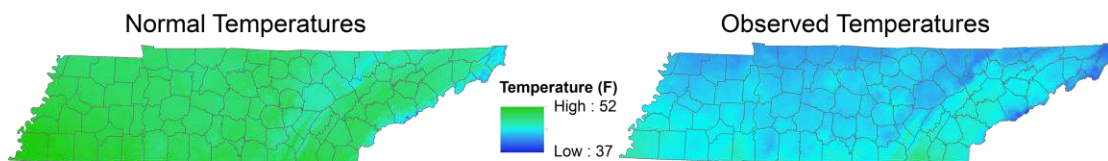
With contributions by Climate Data Representatives at University of Tennessee-Martin, Vanderbilt University, and University of Tennessee-Institute of Agriculture

Monthly Temperature Summary:

A strong cold front that swept the state on Halloween ushered in a cold start to the month. Another reinforcing arctic air mass moved into the state on the 11th bringing record-setting cold temperatures to many areas. Temperatures moderated during the second half of the month, climbing to normal, to a couple degrees above normal. Despite those warmer than normal temperatures, most areas of the state ended up much cooler than normal for the month. Southeast Tennessee was the closest to normal (with departures of 2-4 degrees below normal), while West Tennessee was the most below normal, with mean temperatures 6-8 degrees below normal for the month!



November 2019 Mean Temperature



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	49.5
MEMPHIS INTERNATIONAL AP	WBAN	48
SHILOH NMP TENNESSEE	RAWS	47.6
MC MINNVILLE	COOP	47
AMES PLANTATION	COOP	47

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

Stations with the lowest mean temperature

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	34.4
NEWFOUND GAP	COOP	40.1
TAZEWELL	COOP	40.3
ONEIDA	COOP	40.8
ROAN MOUNTAIN 3SW	COOP	41

Monthly Precipitation Summary:

Precipitation for the month came in the form of both rain and snowfall, associated with several frontal passages. Areas in East Tennessee, and those generally north of the I-40 corridor recorded above normal precipitation, while areas in the southern half of West and Middle Tennessee, along with most of the Cumberland Plateau, recorded below normal precipitation for the month. Despite the dryer than normal conditions across the southern half of the state, rainfall totals were generally in excess of two inches, that precipitation paired with below normal temperatures allowed for continued recovery from the flash drought, which occurred earlier in the fall. Widespread snowfall occurred on the 11th, with about half of the precipitation reporting weather stations in the state recording at least a trace of snowfall. Totals were generally light, with 1-2" of accumulation common in northern West Tennessee and parts of East Tennessee, with higher amounts in the mountains.

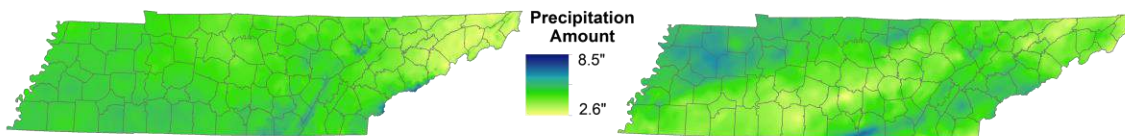


November 2019 Precipitation

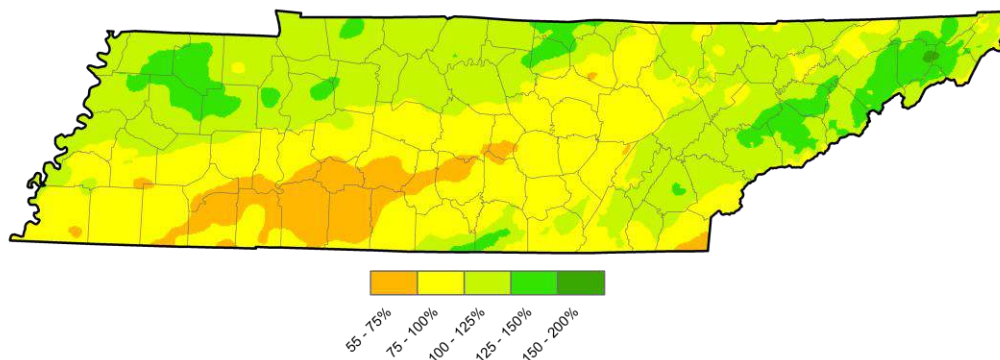


Normal Precipitation

Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
FAYETTEVILLE 1.5 W	CoCoRaHS	7.1
WHITWELL 0.3 SE	CoCoRaHS	6.87
CLARKSVILLE 3.4 NNW	CoCoRaHS	6.86
WINCHESTER 5.4 SSE	CoCoRaHS	6.83
ATWOOD 0.8 WSW	CoCoRaHS	6.74

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

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
LEWISBURG 4.2 NNE	CoCoRaHS	1.33
FINGER 4.1 ENE	CoCoRaHS	1.62
SPRING HILL 2.8 ENE	CoCoRaHS	2.24
MOUNT JULIET 5.2 SSW	CoCoRaHS	2.25
CLEVELAND 4.7 S	CoCoRaHS	2.3

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

Station data for airports across the state using WBAN weather stations:

Station Name	Temperatures (°F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	High	Low	Mean	Departure	High	Date	Low	Date	Obs	Departure	%Norm
Memphis	58.6	37.3	45.4	-7.8	72	11/20	17	11/13	4.31	-1.18	79%
Jackson	56.6	32.5	44.6	-5.5	69	11/20	14	11/13	4.76	-0.14	97%
Clarksville	54.7	31.2	43	-5.4	68	11/10	9	11/13	5.98	1.4	131%
Nashville	57.8	34.3	46.1	-3.7	74	11/6	17	11/13	5.39	1.08	125%
Chattanooga	61.3	37.8	49.5	-1.7	72	11/6	22	11/13	4.61	-0.39	92%
Crossville	54.5	32.1	42.4	-5.1	68	11/6	13	11/13	5.11	0.01	100%
Knoxville	56.8	35.6	46.2	-3.5	68	11/27	19	11/13	6.11	2.1	152%
Bristol	55	32	43.5	-3.1	67	11/27	15	11/13	4.52	1.42	146%

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
ERWIN 1 W*	COOP	77	1
ELIZABETHTON*	COOP	77	1
GREENEVILLE EXP STA*	COOP	76	1
DECATURVILLE	COOP	75	7
LYNCHBURG	COOP	75	7
WOODBURY 1 WNW	COOP	75	7
MC MINNVILLE	COOP	75	6
MONTEAGLE	WBAN	74	24
NASHVILLE INTL AP	WBAN	74	6
BURNS TENNESSEE	RAWS	74	6
MERIWETHER LEWIS TENNESSEE	RAWS	74	6
SHILOH NMP TENNESSEE	RAWS	74	6
FAYETTEVILLE WATER PLANT	COOP	74	6

*** COOP station high temperature reported at 7am from the previous 24hrs. These three warmest stations reported these high temperatures on Nov 1, but the highs were observed on Oct 31, before the strong frontal passage that brought in the record cold start to November.**

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	1	13
ROAN MOUNTAIN 3SW	COOP	8	13
CLARKSVILLE OUTLAW AP	WBAN	9	13
WHITE HOUSE	COOP	9	13
NEWFOUND GAP	COOP	9	13
MILAN EXP STN	COOP	9	13
DECATURVILLE	COOP	10	13
CHARLOTTE	COOP	10	13
TAZEWELL	COOP	10	13
CROSSVILLE 7 NW	WBAN	11	13
MERIWETHER LEWIS TENNESSEE	RAWS	11	13
LEXINGTON	COOP	11	13
UT MARTIN EXP STATION	COOP	11	12
SPRINGFIELD EXP STATION	COOP	11	13
DOVER 1 W	COOP	11	13
COALMONT	COOP	11	13
TENNESSEE RIDGE	COOP	11	14

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	49.5
MEMPHIS INTERNATIONAL AP	WBAN	48
SHILOH NMP TENNESSEE	RAWS	47.6
MC MINNVILLE	COOP	47
AMES PLANTATION	COOP	47
PRENTICE COOPER SF TENNESSEE	RAWS	46.9
LEWISBURG TOWER TENNESSEE	RAWS	46.6
PIKEVILLE	COOP	46.5
INDIAN GRAVE TENNESSEE	RAWS	46.3
FAYETTEVILLE WATER PLANT	COOP	46.3

Cooltest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	34.4
NEWFOUND GAP	COOP	40.1
TAZEWELL	COOP	40.3
ONEIDA	COOP	40.8
ROAN MOUNTAIN 3SW	COOP	41
MILAN EXP STN	COOP	41.3
BETHPAGE 1 S	COOP	41.4
CENTERVILLE 4NE	COOP	41.6
GLADEVILLE	COOP	41.8
NEWCOMB	COOP	41.8

Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
FAYETTEVILLE 1.5 W	CoCoRaHS	7.1
WHITWELL 0.3 SE	CoCoRaHS	6.87
CLARKSVILLE 3.4 NNW	CoCoRaHS	6.86
WINCHESTER 5.4 SSE	CoCoRaHS	6.83
ATWOOD 0.8 WSW	CoCoRaHS	6.74
UT MARTIN EXP STATION	COOP	6.72
CLEVELAND FILTER PLANT	COOP	6.64
MILAN EXP STN	COOP	6.59
CLARKSVILLE WWTP	COOP	6.56
CAMDEN 0.7 SE	CoCoRaHS	6.51

Driest Stations (lowest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
LEWISBURG 4.2 NNE	CoCoRaHS	1.33
FINGER 4.1 ENE	CoCoRaHS	1.62
SPRING HILL 2.8 ENE	CoCoRaHS	2.24
MOUNT JULIET 5.2 SSW	CoCoRaHS	2.25
CLEVELAND 4.7 S	CoCoRaHS	2.3
HOHENWALD 0.3 E	CoCoRaHS	2.32
SOMERVILLE 10N	COOP	2.4
ROAN MOUNTAIN 3SW	COOP	2.41
LAWRENCEBURG 1.4 E	CoCoRaHS	2.48
ROGERSVILLE 7.8 ENE	CoCoRaHS	2.63

Snowiest Stations

Station Name	Station Type	Total Snowfall (in)
CLARKSVILLE 9.3 ESE	CoCoRaHS	5
BYRDSTOWN 2.8 SSW	CoCoRaHS	3
TAZEWELL	COOP	2.6
MT LCONTE	COOP	2.5
ROAN MOUNTAIN 7.1 W	CoCoRaHS	2.5
MAYNARDVILLE	COOP	2.5
MAYNARDVILLE 0.6 E	CoCoRaHS	2.2
FARRAGUT 1.0 WNW	CoCoRaHS	2.2
KYLES FORD 1.0 N	CoCoRaHS	2.1

Drought Monitor:

At the start of November, large areas of East Tennessee and the Cumberland Plateau remained in drought conditions from the flash drought that affected the state earlier in the fall. However, this area of the state also recorded some of the highest precipitation totals over the month, leading to weekly improvements in drought conditions. By the last Drought Monitor release at the end of November, all but a few small areas of D0 had been cleared from the state.

Author:

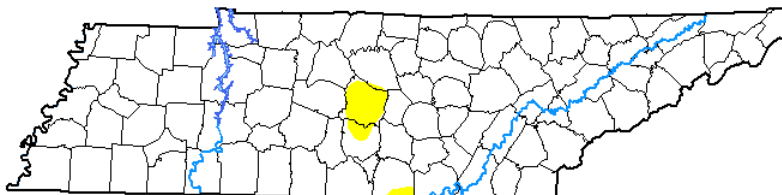
Brad Rippey
U.S. Department of Agriculture

**U.S. Drought Monitor
Tennessee**

November 26, 2019

(Released Wednesday, Nov. 27, 2019)

Valid 7 a.m. EST



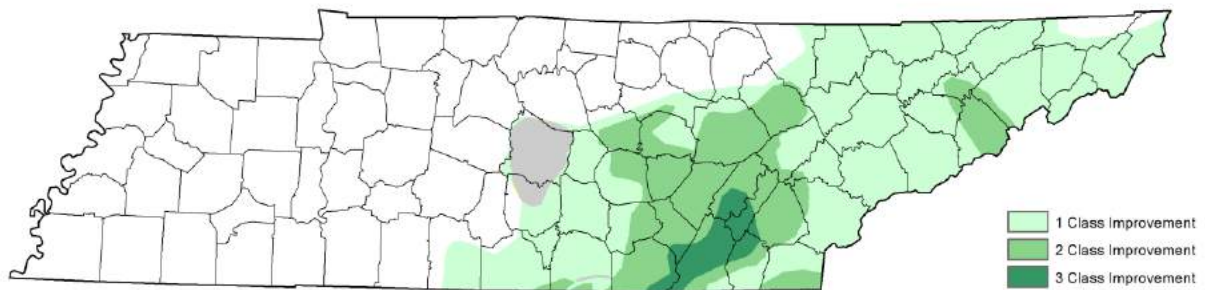
Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <http://droughtmonitor.unl.edu/About.aspx>

November 26, 2019
 compared to
 October 29, 2019

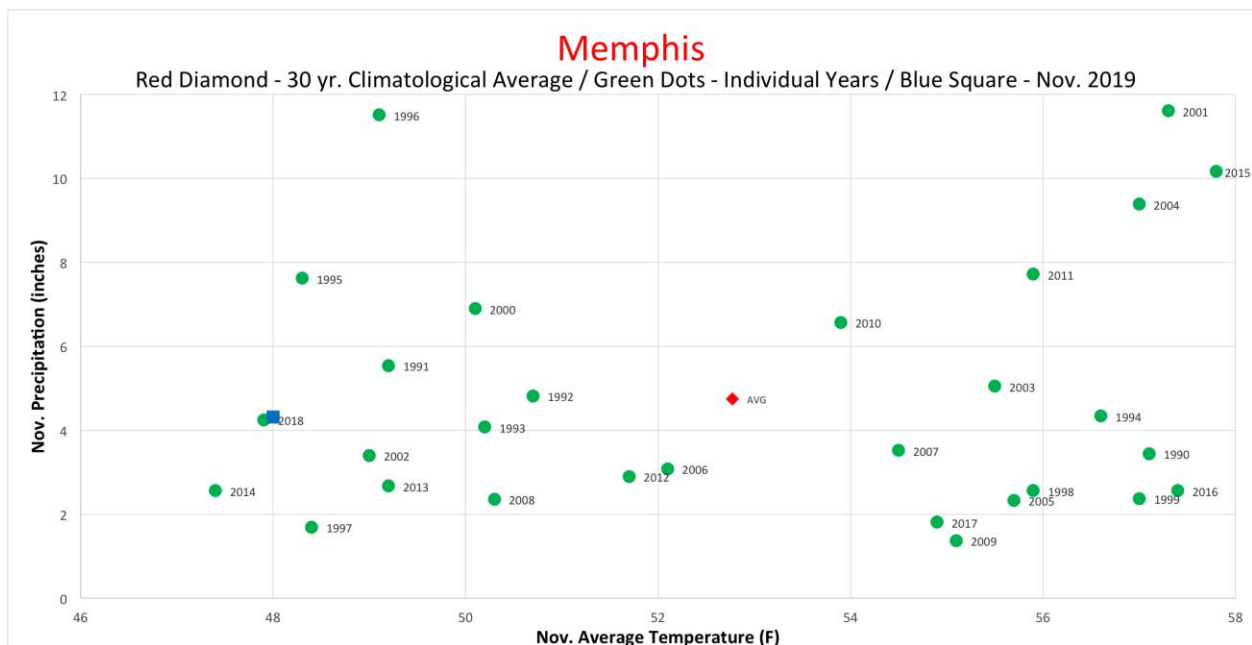
U.S. Drought Monitor Class Change - Tennessee 1 Month

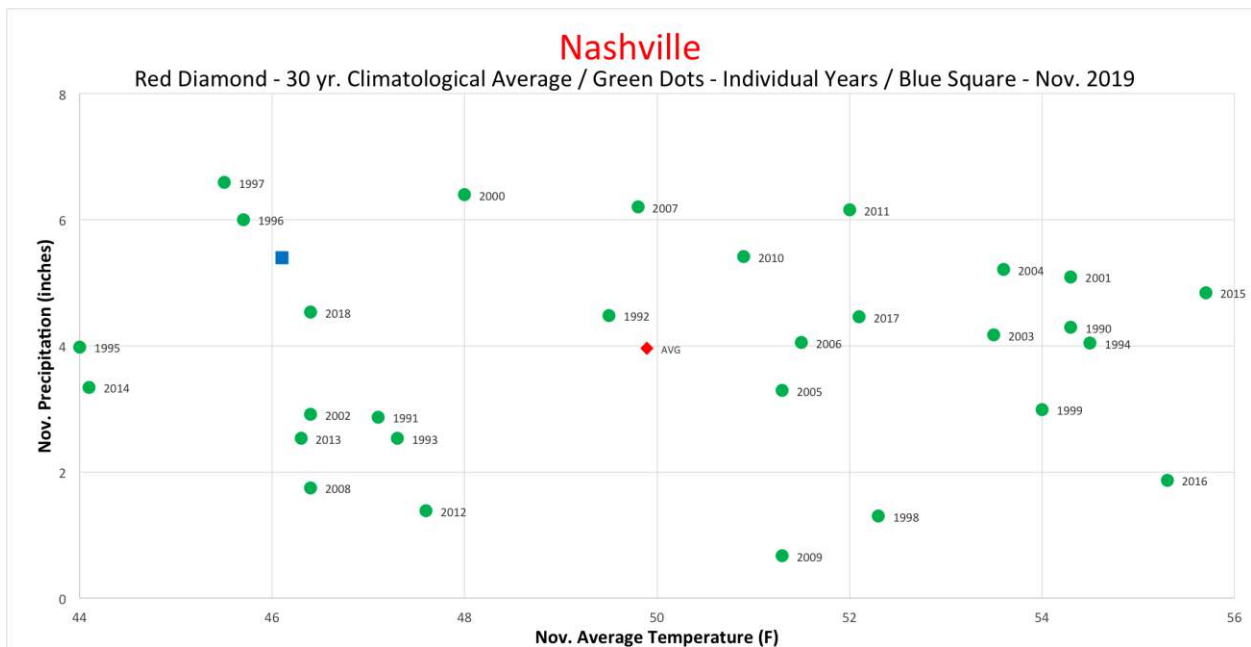
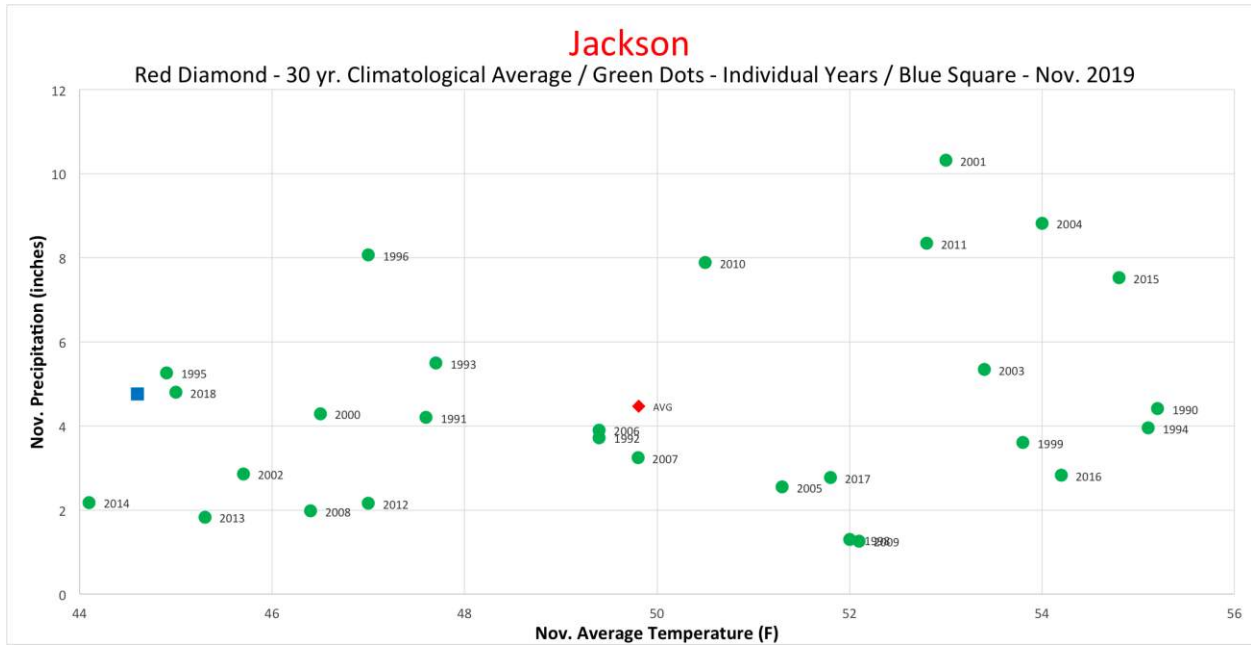


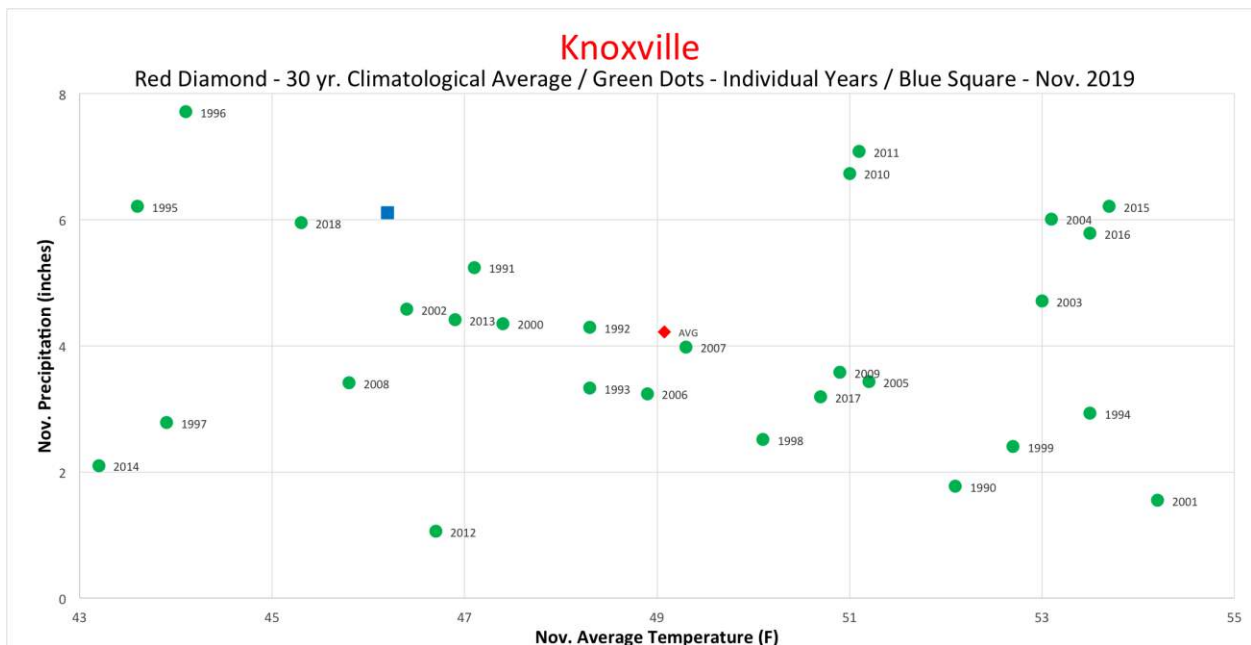
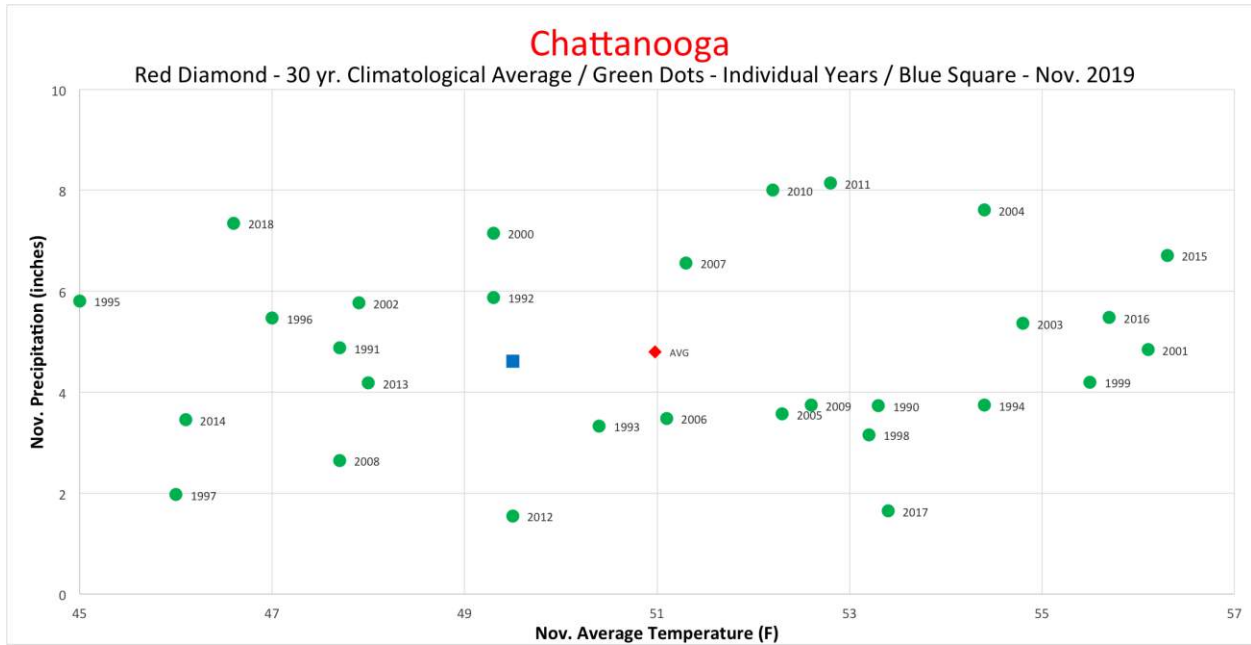
droughtmonitor.unl.edu

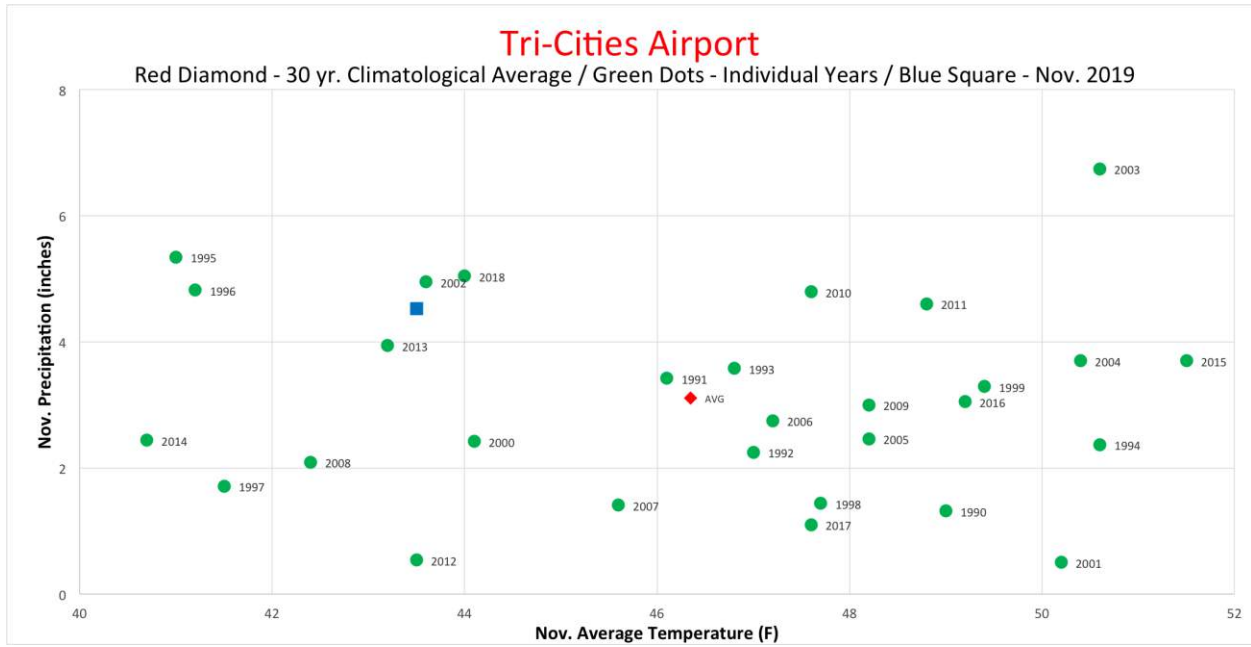
The Month in Comparison:

Comparing the average temperature and precipitation patterns for cities across the state with the past thirty years, we can see that all cities were colder than normal, with Jackson recording their second coldest November and Memphis recording its third coldest November over that time period. Some cities recorded above normal rainfall, while Memphis was a good bit dryer than normal, and Jackson and Chattanooga were slightly below normal; however none of these departures stood out from the observations in the last thirty years.



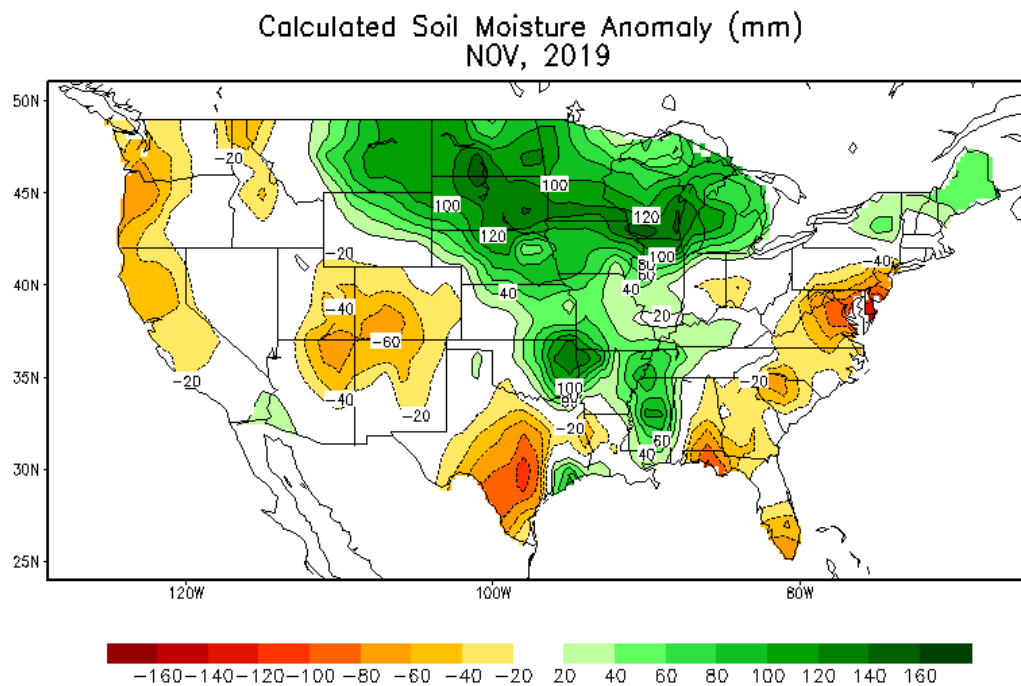
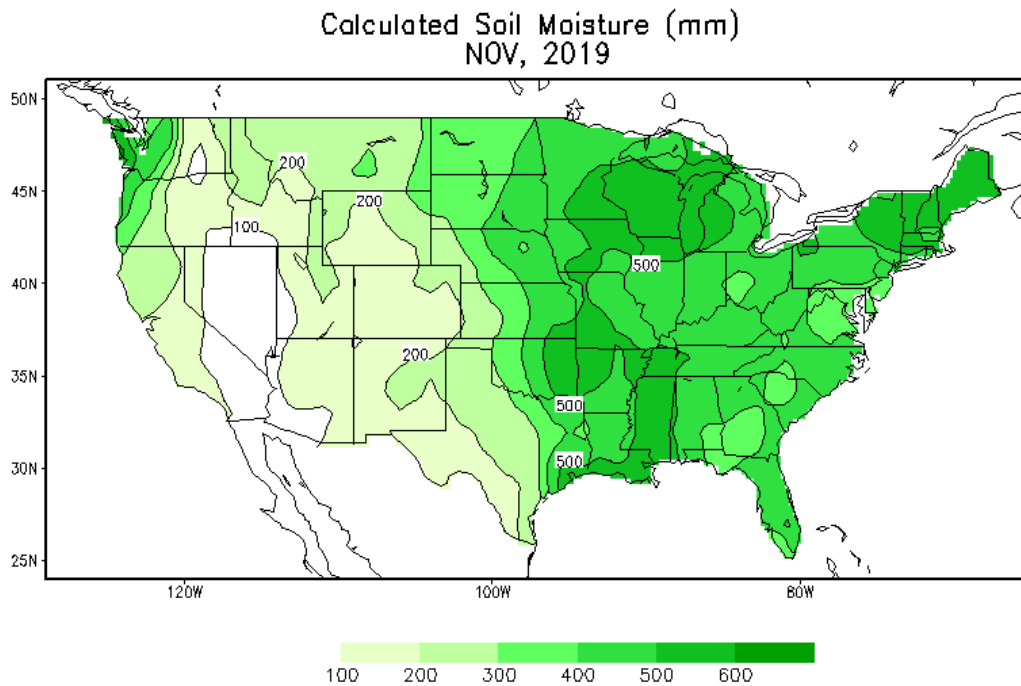




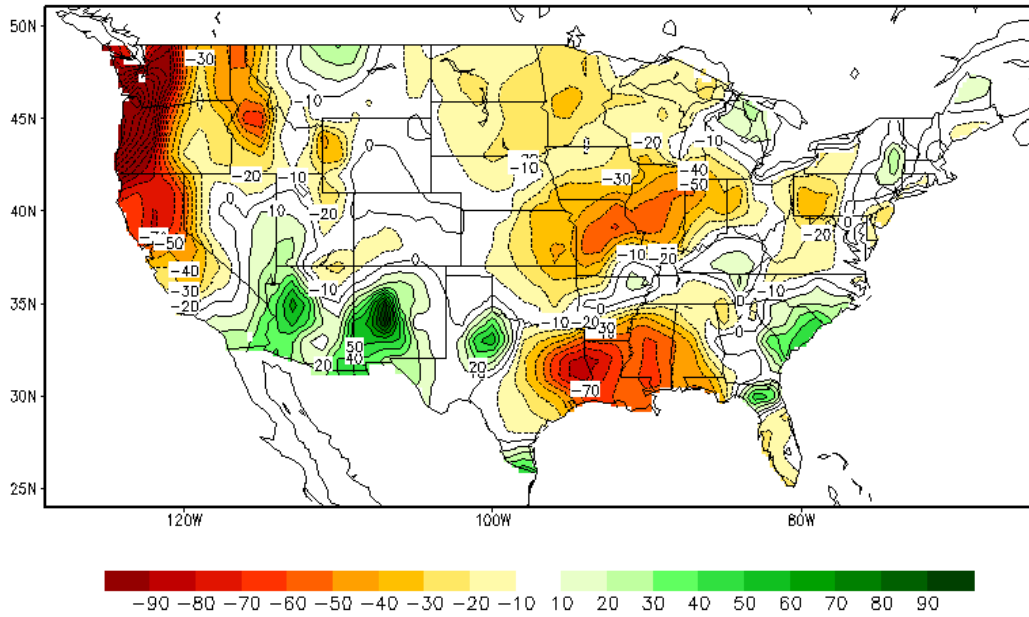


Soil Moisture:

Soil moisture across the state averaged around 400-500mm for the month, with higher amounts in West Tennessee. These readings were close to normal for the eastern half of the state, and 20-80mm above normal in the western half of the state. Most of the state recorded minor decreases in soil moisture during the month, with the northern Cumberland Plateau and northwest corner of the state recording minor increases.



Calculated Soil Moisture Anomaly Change
NOV 29, 2019 from OCT.31



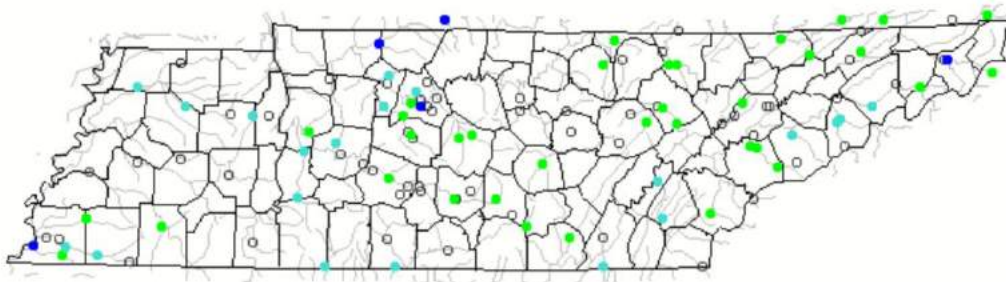
Streamflow:

In another sign of recovery from the flash drought, all stream gauges in the state reported an average monthly flow rate at or above normal, with a few gauges reporting much above normal stream flow.

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

Tennessee ▼ or Water-Resources Regions ▼

November 2019



Search USGS streamgage 🔍

Choose a data retrieval option and select a location on the map
 List of all stations Single station Nearest stations Peak flow

Explanation - Percentile classes							
Low	<10 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: A couple hard freezes in the first half of the month largely brought an end to the growing season for the year. Corn harvests were completed across the state by the middle of the month. Towards the end of November many Tennessee producers faced weather challenges in their efforts to finish cotton and soybean harvests and cover crop plantings. Up to 2 inches of rain pushed through the State in some areas late last week and brought these activities to a standstill. Fortunately, producers who were able to get crops out of the field were optimistic about the yields and quality. Because of drier weather conditions earlier in the fall that stunted pasture development, producers are feeding hay earlier than normal and are concerned about their hay supplies lasting through the winter. By the end of the month topsoil moisture was rated 1% very short, 6% short, 70% adequate, and 23% surplus. Subsoil moisture was rated 1% very short, 10% short, 74% adequate, and 15% surplus.

November 14th Crop Progress Report from the USDA:

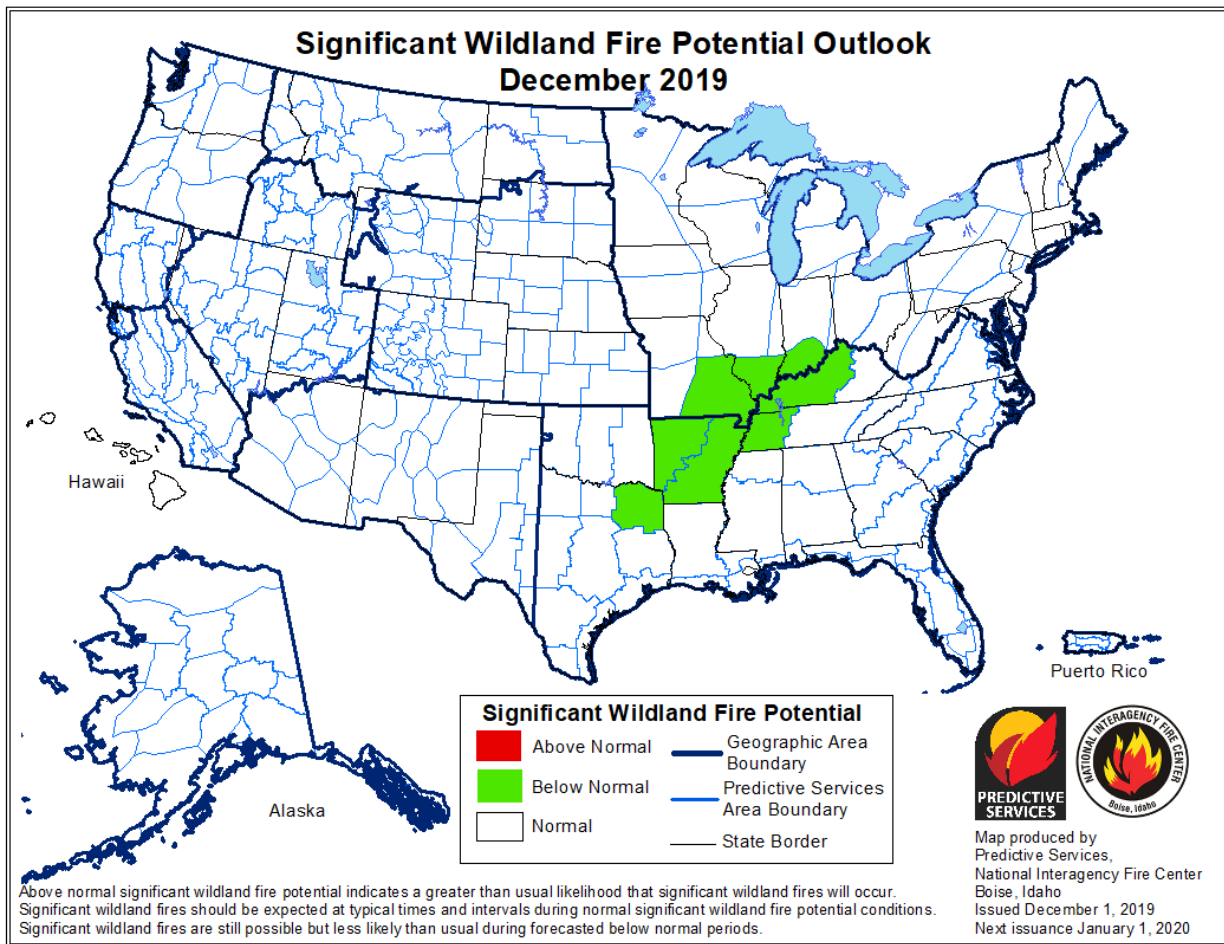
CROP PROGRESS					CONDITION					
Crop	This Week	Last Week	2018	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
Percent					Percent					
Corn – Harvested	100	99	98	99	Wheat	4	4	28	56	8
Cotton – Harvested	73	67	80	75	Pasture	10	30	41	17	2
Soybeans – Harvested	80	75	71	79						
Winter Wheat – Planted	68	58	66	75						
Winter Wheat – Emerged	48	36	47	51						

November 26th Crop Progress Report from the USDA:

CROP PROGRESS					CONDITION					
Crop	This Week	Last Week	2018	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
Percent					Percent					
Cotton – Harvested	88	79	91	92	Wheat	4	4	31	52	9
Soybeans – Harvested	91	85	82	91	Pasture	10	32	42	14	2
Winter Wheat – Planted	87	81	82	N/A						
Winter Wheat – Emerged	72	58	66	N/A						

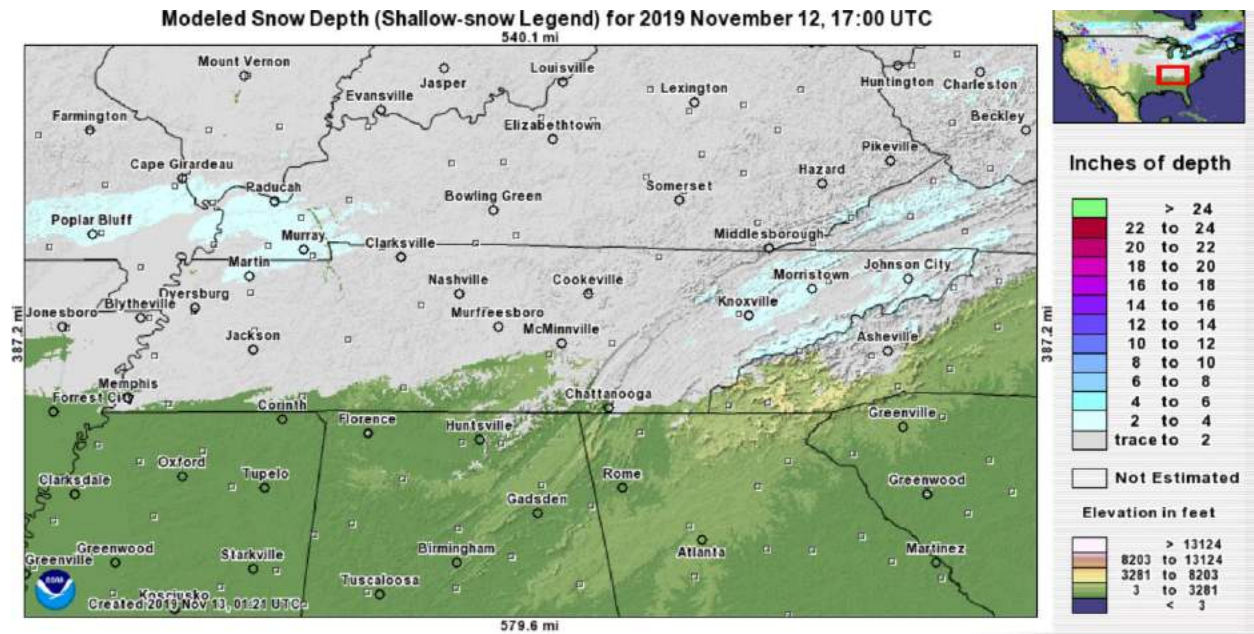
Fire Danger:

The Interagency Fire Center outlook for significant wildland fire shows that West Tennessee will have below normal risk, while the rest of the state will have normal wildfire potential for December.



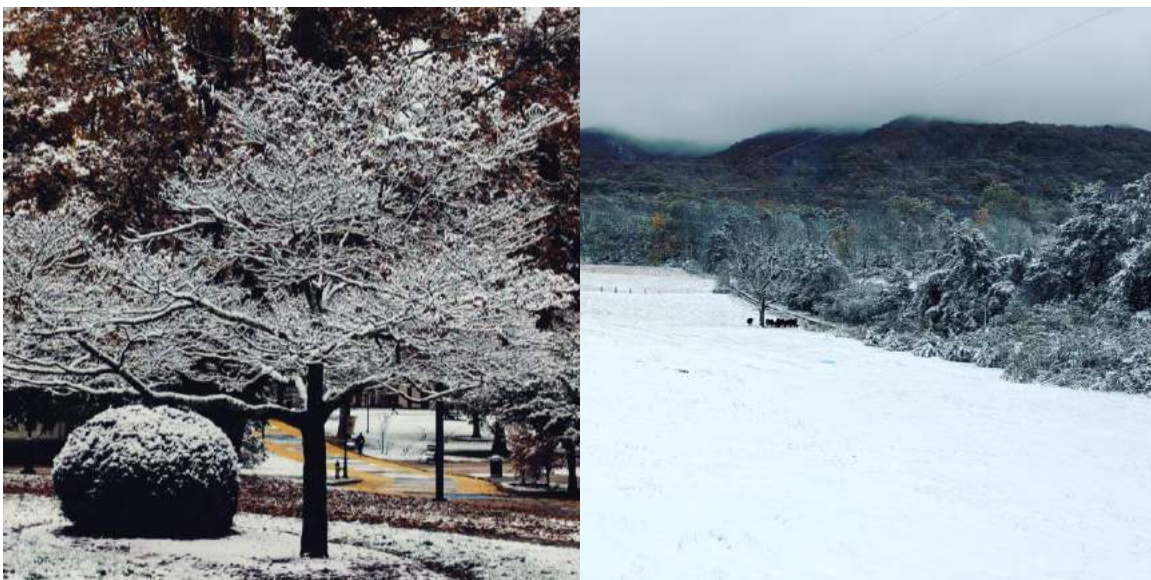
Fall Foliage: An early hard freeze following a strong cold front on November 11th brought an end to most of the fall colors, just as peak color was being reported in Nashville and Memphis, along with the southern half of the state.

Snow: In November 187 of 346 precipitation reporting weather stations (54%) reported at least a trace of snowfall: 17 stations reported at least 2" of snowfall, 27 more reported at least 1" of snowfall, 75 more stations had measurable snow of less than 1", and 68 more had a trace amount of snowfall. Most of this snow fell late on November 11th into the morning of November 12th, resulting in the most snow coverage midday on the 12th. Knoxville set their record for the earliest recorded 1" or more of snowfall. The mountains recorded a couple of additional light snowfalls later in the month, but with any accumulation limited to the elevations above 3,000ft.



Story of the Month:

The biggest weather and climate story for November 2019 was the record-setting cold and some measurable snows in the first half of the month. The month started off cold, with a strong cold front sweeping the state on Halloween, bringing the first snowflakes of the season, and minor accumulations in the mountains reported on the morning of the 1st. A second, reinforcing frontal passage brought in widespread snowfall overnight on the 11th and into the 12th as an arctic air mass caught the tail end of the frontal precipitation. Accumulations were minor, with 1-2" accumulations common in the northwest corner of the state, and in East Tennessee, with some higher totals in the mountains. This event set the record for the earliest 1" or more of snowfall in Knoxville, and the snowfall totals at the Nashville (0.4"), Tri-Cities (1.1"), and Knoxville (1.7") airports were higher than the season-to-date snowfall total of Anchorage, Alaska (which had only recorded 0.2" of snowfall through November 12th, about 13" below their average season-to-date total)!



Images of snow on the campus of East Tennessee State University, and in the mountains in Washington County, TN.



US National Weather Service Morristown Tennessee

12 November at 17:48 · 🌐



The snowfall today set a record for earliest snowfall of equal to or greater than an inch of snow for Knoxville. Thanks for all the pictures and reports today! #mrwxw



Fall Snowfall Statistics

National Weather Service – Morristown, TN

SITE	Earliest Recorded Measurable Snowfall	Earliest Recorded Snowfall of 1.0" or greater
Knoxville	0.2" – November 8, 1991	1.7" – November 12, 2019
Tri-Cities	0.1" – October 20, 1989	1.1" – November 1, 2014
Chattanooga	0.3" - November 9, 1913	6.5" - November 14, 1906

Records date back to 1879 for CHA, 1871 for TYS, and 1937 for TRI.

The cold air the following days lead to mean temperatures that were more than 10°F below normal across the state. This cold air was the strongest, and most below normal, in the western half of the state. Daily record low temperatures were set at Memphis, Jackson, Clarksville, Nashville, Crossville, Oak Ridge, and Knoxville on the 12th. Record low high temperatures were also recorded at Memphis, Jackson, Clarksville, and Nashville on the 12th, each with high temperatures remaining below freezing for the day. Record low temperatures were recorded at Memphis, Jackson, Clarksville, Nashville, Crossville, Oak Ridge, Chattanooga, and the Tri-Cities on November 13th. On November 13th, the Memphis airport recorded a low of 17°F, setting a record for the earliest date of a teen reading for the station. Additionally, all weather stations in West Tennessee recorded temperatures below 20°F that morning!



US National Weather Service Memphis Tennessee

13 November at 18:40 · 🌐



The low this morning at the Memphis airport was 17 degrees which set a daily record. It also is the earliest teen reading on record. The previous was 16 degrees on the 15th of November 1940. Tupelo MS set a daily record with a low of 17 but on the 5th of NOV in 1976 it was 18.



US National Weather Service Memphis Tennessee
14 November at 16:26 · 🌐

Well...yesterday was a pretty historic day for cold temperatures across the country, and especially for the Mid-South.

- ➔ 38 low temp records broken
- ➔ 18 significant records
- ➔ Many 50+ year records fell

Record Setting Lows Yesterday Weather Forecast Office
Office Name 
November 13th, 2019 Record Low Temperatures Issued November 14, 2019 2:57 PM CT



-18 Significant Low Temperature Records were broken across the Mid-South yesterday

-Significant Climate Record = 30 + year records

-38 Total Records were broken (<30 year of records)

-Memphis Intl. Airport broke an 80 year-old record for the day

 **NWS Memphis** weather.gov/memphis

Storm Reports:

There were no reports of severe weather damage in the state of Tennessee during the month of November.

CPC Outlooks for the Next Month:

Looking ahead to December, much of the US, including all of Tennessee will likely see temperatures above normal. The November pattern for precipitation will likely continue into December, with all but the southwest corner of the state likely to see above normal precipitation in the month.

