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Tennessee Climate Office Monthly Report

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### 2019 December - Tennessee Monthly Climate Report

Tennessee Climate Office, East Tennessee State University

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# December 2019 Tennessee State Climate Summary

Tennessee Climate Office \* East Tennessee State University

Prepared by William Tollefson and Dr. Andrew Joyner

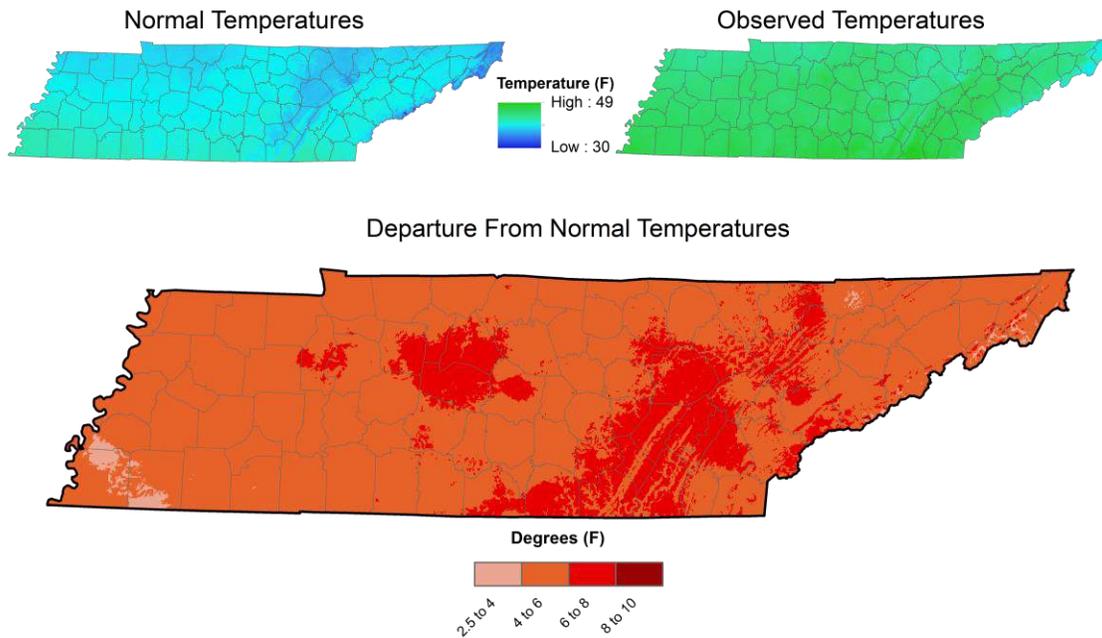
With contributions by Climate Data Representatives at University of Tennessee-Martin, Vanderbilt University, and University of Tennessee-Institute of Agriculture

## Monthly Temperature Summary:

In a major turn around from November, temperatures across the state were well above normal for the month of December. Based on observations from airport weather stations, all major cities across the state, except Chattanooga, recorded a mean December temperature that was equal to or warmer than the mean temperature for November. The month started on a cold note, but temperatures quickly warmed to above normal for the following weeks, culminating in temperatures that were 8-10°F above normal for the second half of the month. Mean temperatures for the month placed most locations in Middle and East Tennessee among their top-10 warmest Decembers. December 29<sup>th</sup> brought record-setting high temperatures to Clarksville (66°F), Oak Ridge (70°F), Bristol/Tri-Cities (74°F), and Knoxville (78°F); as well as record high, low temperatures to Clarksville (50°F), Bristol/Tri-Cities (50°F), Oak Ridge (54°F), Crossville (56°F), and Chattanooga (62°F).



## December 2019 Mean Temperature



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	49.2
MC MINNVILLE	COOP	48.9
NASHVILLE INTL AP	WBAN	48.4
LEWISBURG TOWER TENNESSEE	RAWS	48.1
SHELBYVILLE WATER DEPT	COOP	48

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	31.8
NEWFOUND GAP	COOP	38
ROAN MOUNTAIN 3SW	COOP	40.1
MAYNARDVILLE	COOP	40.3
TAZEWELL	COOP	40.8

### Monthly Precipitation Summary:

Rainfall patterns in December produced heavier and more widespread rains in the eastern half of the state; up until the last system of the year when large portions of West Tennessee recorded two or more inches of rainfall. However, most of West Tennessee recorded monthly precipitation totals below normal, with counties along the Mississippi River recording only 50% to 75% of normal rainfall. Across most of Middle and East Tennessee, areas recorded 100% to 150% of their normal December precipitation totals, with a few areas in the higher elevations and northeastern Middle Tennessee even recording 150% to 200% normal rainfall.

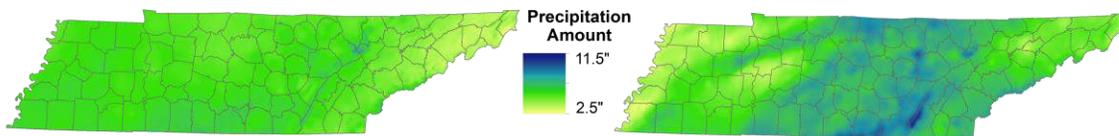


## December 2019 Precipitation

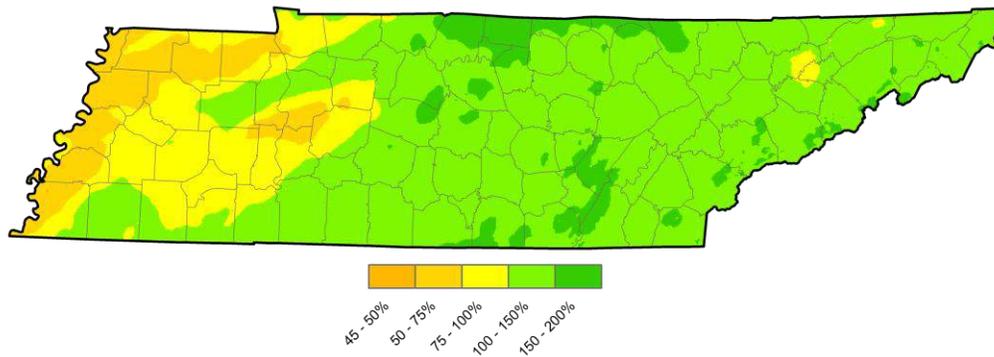


Normal Precipitation

Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
SIGNAL MOUNTAIN 2.2 NE	CoCoRaHS	10.83
WINCHESTER 5SE	COOP	10.7
MONTEREY	COOP	10.42
WHITWELL 0.3 SE	CoCoRaHS	9.61
DUNLAP 2.9 W	CoCoRaHS	9.48

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)
MAYNARDVILLE	COOP	2.28
DICKSON 6.7 SSW	CoCoRaHS	2.67
MORRISTOWN WFO	COOP	3.02
OAK GROVE 3.0 E	CoCoRaHS	3.05
WAVERLY AIRPORT	COOP	3.1

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
<b>Memphis</b>	55.8	38.8	46.0	<b>2.4</b>	71	12/26	24	12/11	4.04	<b>-1.70</b>	<b>70%</b>
<b>Jackson</b>	56	35.3	45.6	<b>4.8</b>	70	12/28	21	12/19	4.67	<b>-0.68</b>	<b>87%</b>
<b>Clarksville</b>	53.1	35.2	44.8	<b>6.1</b>	71	12/28	19	12/19	3.79	<b>-1.24</b>	<b>75%</b>
<b>Nashville</b>	57.9	38.9	48.4	<b>8.0</b>	73	12/28	23	12/19	5.00	<b>0.76</b>	<b>118%</b>
<b>Chattanooga</b>	58.4	40.1	49.2	<b>6.6</b>	72	12/29	27	12/20	4.91	<b>0.01</b>	<b>100%</b>
<b>Crossville</b>	53.1	35.3	44.2	<b>5.7</b>	65	12/28	19	12/19	6.39	<b>1.44</b>	<b>129%</b>
<b>Knoxville</b>	56.7	37.4	47.1	<b>6.3</b>	78	12/29	24	2/20	4.96	<b>0.46</b>	<b>110%</b>
<b>Bristol</b>	54.7	32.3	43.5	<b>5.7</b>	74	12/29	19	12/19	3.24	<b>-0.13</b>	<b>96%</b>

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
KNOXVILLE AP	WBAN	78	29
MORRISTOWN RADIO WCRK	COOP	75	30
KINGSPORT	COOP	75	29
MORRISTOWN WFO	COOP	75	29
BRISTOL AP	WBAN	74	29
HAMBLEN CO HQ TENNESSEE	RAWS	74	29
GATLINBURG 2 SW	COOP	74	30
NASHVILLE INTL AP	WBAN	73	28
INDIAN GRAVE TENNESSEE	RAWS	73	29
ROCK ISLAND STATE PARK	COOP	73	17
AMES PLANTATION	COOP	73	26
COOKEVILLE	COOP	73	25
CARTHAGE	COOP	73	29
ROGERSVILLE 1 NE	COOP	73	30
NEWPORT 1 NW	COOP	73	16
GREENEVILLE EXP STA	COOP	73	30
CELINA	COOP	73	31
CLARKSVILLE WWTP	COOP	73	27
NASHVILLE BERRY FIELD	COOP	73	29

**Coldest Stations (lowest minimum temperature)**

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	6	19
CENTERVILLE 4NE	COOP	13	12
NEWFOUND GAP	COOP	14	20
GAINESBORO	COOP	15	19
ROAN MOUNTAIN 3SW	COOP	15	20
TAZEWELL	COOP	16	21
BETHPAGE 1 S	COOP	16	20
PICKETT STATE PARK	COOP	16	19
CROSSVILLE 7 NW	WBAN	17	11
BIG SOUTH TENNESSEE	RAWS	17	19
MILAN EXP STN	COOP	17	11
CROSSVILLE EXP STN	COOP	17	12
WHITE HOUSE	COOP	17	19

**Warmest Stations (highest mean temperatures)**

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	49.2
MC MINNVILLE	COOP	48.9
NASHVILLE INTL AP	WBAN	48.4
LEWISBURG TOWER TENNESSEE	RAWS	48.1
SHELBYVILLE WATER DEPT	COOP	48
AMES PLANTATION	COOP	47.8
MEMPHIS INTERNATIONAL AP	WBAN	47.7
SHILOH NMP TENNESSEE	RAWS	47.7
NASHVILLE BERRY FIELD	COOP	47.7
FAYETTEVILLE WATER PLANT	COOP	47.7

**Cooltest Stations (lowest mean temperatures)**

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	31.8
NEWFOUND GAP	COOP	38
ROAN MOUNTAIN 3SW	COOP	40.1
MAYNARDVILLE	COOP	40.3
TAZEWELL	COOP	40.8
MONTGOMERY BELL STATE PARK	COOP	42
CROSSVILLE EXP STN	COOP	42.1
ONEIDA	COOP	42.1
JAMESTOWN	COOP	42.3
BETHPAGE 1 S	COOP	42.5

**Wettest Stations (highest precipitation totals):**

Station Name	Station Type	Total Precipitation (in)
SIGNAL MOUNTAIN 2.2 NE	CoCoRaHS	10.83
WINCHESTER 5SE	COOP	10.7
MONTEREY	COOP	10.42
WHITWELL 0.3 SE	CoCoRaHS	9.61
DUNLAP 2.9 W	CoCoRaHS	9.48
BYRDSTOWN 8.7 E	CoCoRaHS	9.37
WINCHESTER 3.9 W	CoCoRaHS	9.35
FAYETTEVILLE 8.6 S	CoCoRaHS	9.35
WHITWELL 3.0 SSE	CoCoRaHS	9.33
PIKEVILLE 7.5 SW	CoCoRaHS	9.25

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

Station Name	Station Type	Total Precipitation (in)
MAYNARDVILLE	COOP	2.28
DICKSON 6.7 SSW	CoCoRaHS	2.67
MORRISTOWN WFO	COOP	3.02
OAK GROVE 3.0 E	CoCoRaHS	3.05
WAVERLY AIRPORT	COOP	3.1
HENRY 4.5 N	CoCoRaHS	3.11
GERMANTOWN 4SE	COOP	3.17
WARNER PARK	COOP	3.19
UT MARTIN EXP STATION	COOP	3.22
BRISTOL AP	WBAN	3.24
LEWISBURG 4.2 NNE	CoCoRaHS	1.33

### Snowiest Stations

Station Name	Station Type	Total Snowfall (in)
MT LECONTE	COOP	8
ALTAMONT 3.9 NW	CoCoRaHS	4
NEWFOUND GAP	COOP	3.3
PIKEVILLE 7.5 SW	CoCoRaHS	3.3
MAYNARDVILLE	COOP	3
CROSSVILLE 6.9 S	CoCoRaHS	3
TAZEWELL	COOP	2.7
CROSSVILLE 4.7 S	CoCoRaHS	2.7
FALL CREEK FALLS SP	COOP	2.5
NORRIS 0.6 NW	CoCoRaHS	2.5
CROSSVILLE 11.3 ENE	CoCoRaHS	2.5
OLIVER SPRINGS 9.0 W	CoCoRaHS	2.5
PIKEVILLE 8.2 WSW	CoCoRaHS	2.5
HARRIMAN 4.1 NNE	CoCoRaHS	2.5
JEFFERSON CITY 0.9 SE	CoCoRaHS	2.5

Of the 333 reporting stations in Tennessee, 49.5% of stations had at least a trace of snowfall, with 59 stations reporting 1" or more, 51 stations reporting between 0.1" and 0.9", and an additional 55 stations reporting a trace of snowfall.

### Drought Monitor:

The state of Tennessee remained drought-free for the month of December. The last areas of D0 (Abnormally Dry) conditions, present from the fall drought, were removed in the December 3<sup>rd</sup> release of the U.S. Drought Monitor, and no new areas of drought were indicated in the last release of the month on December 24<sup>th</sup>. In addition, no new areas of drought are expected in Tennessee for the first Drought Monitor release in January.

*Author:*  
Brad Pugh  
CPC/NOAA

## U.S. Drought Monitor Tennessee

**December 24, 2019**  
(Released Thursday, Dec. 26, 2019)  
Valid 7 a.m. EST



**Intensity:**

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

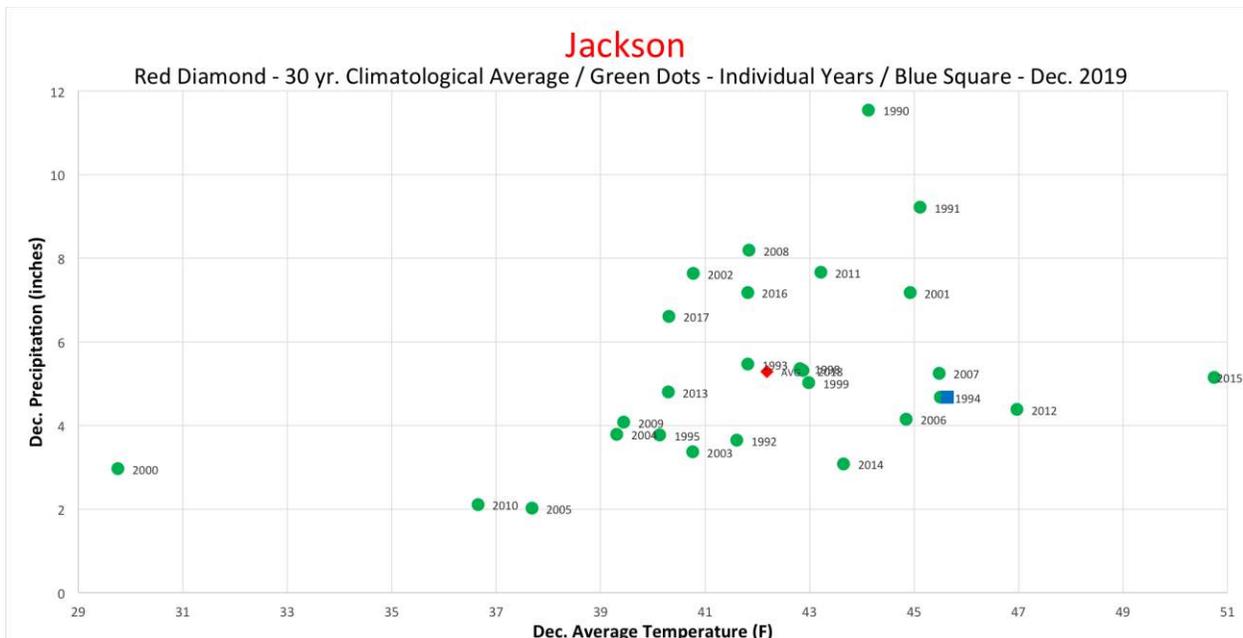
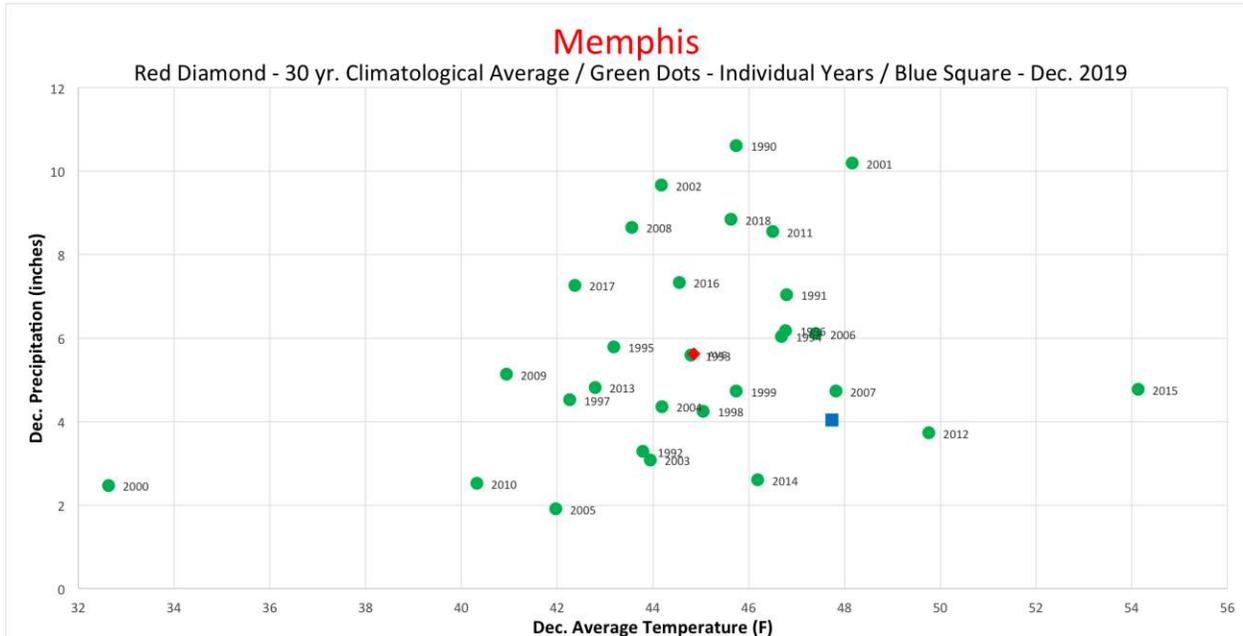
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

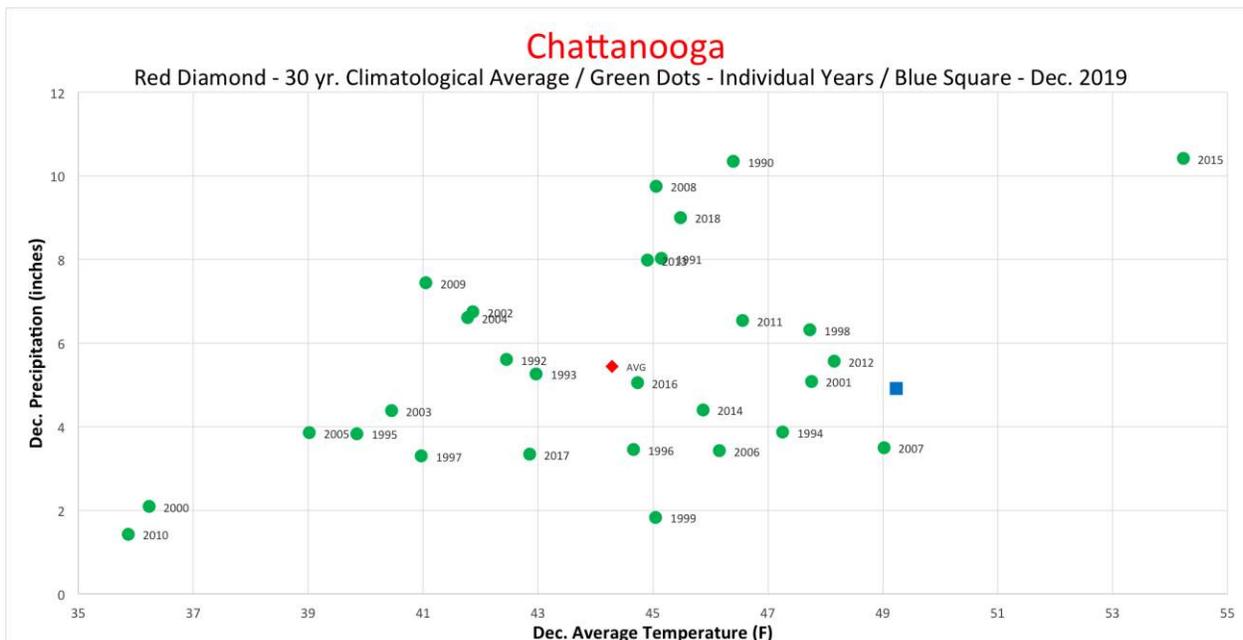
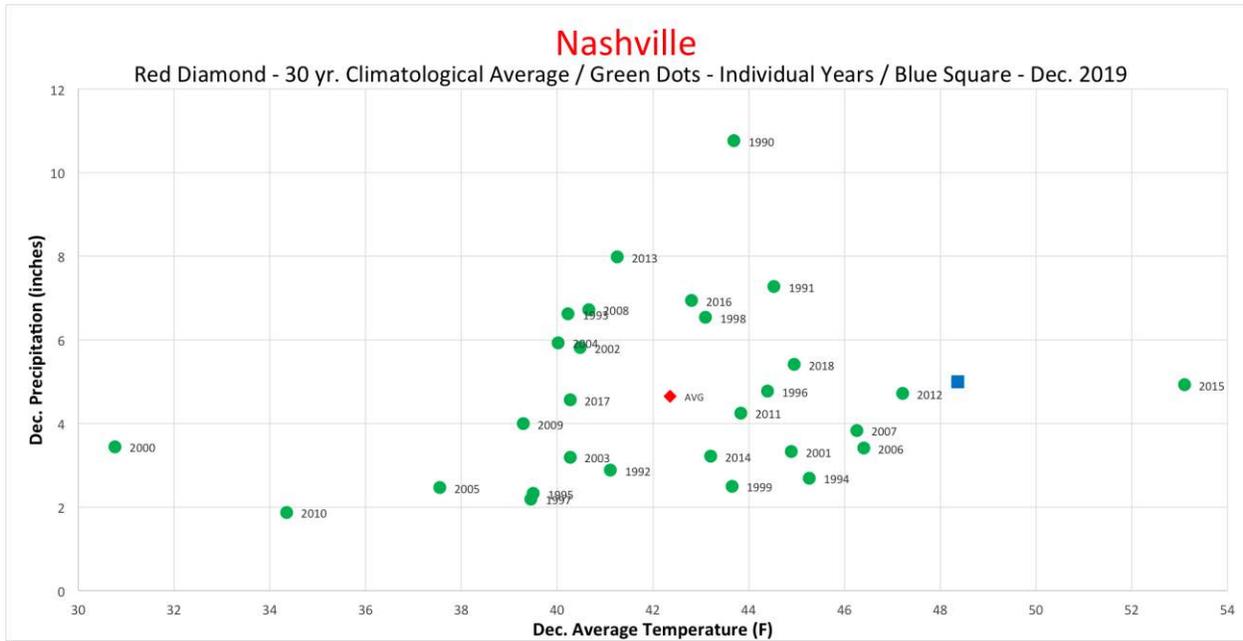
droughtmonitor.unl.edu

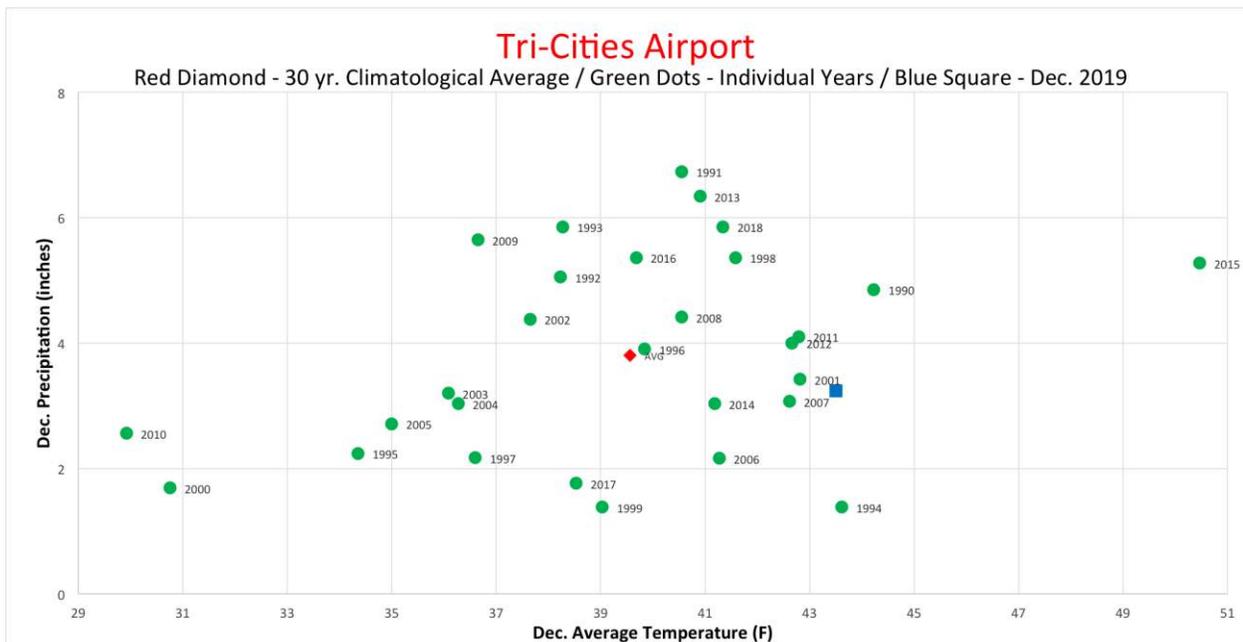
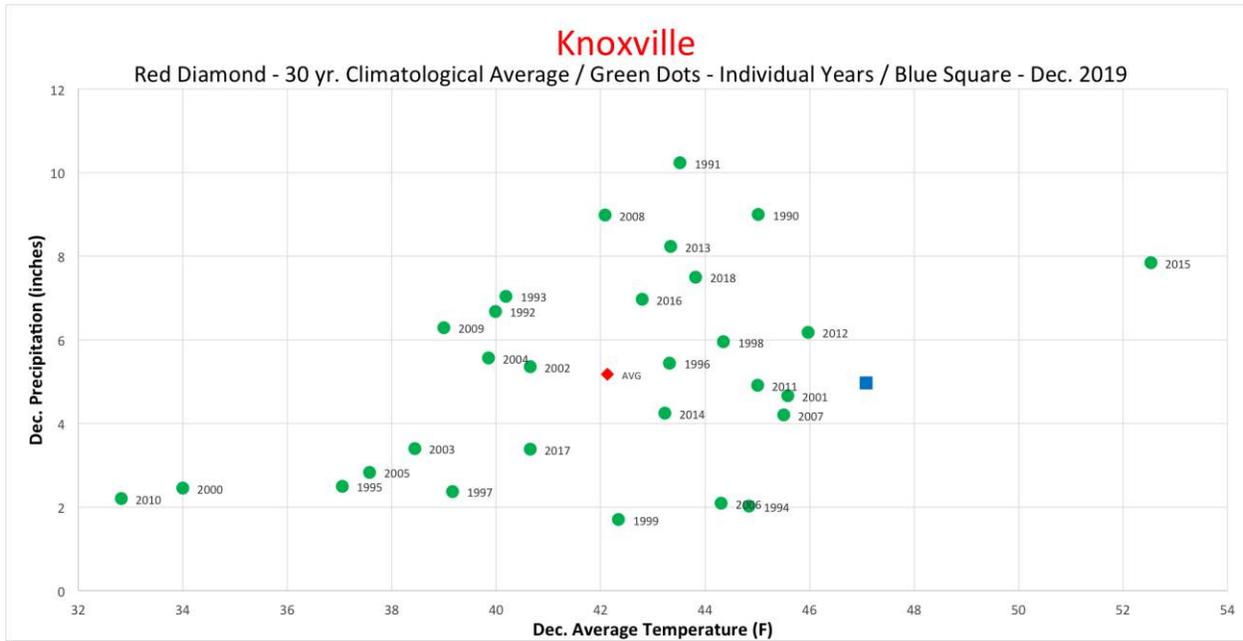


### The Month in Comparison:

As indicated in the temperature and precipitation summary sections, most locations across the state were warmer than normal, while precipitation was split, with some locations recording above normal rainfall, while others recorded below normal precipitation. Nashville, Chattanooga, and Knoxville each had their second warmest December of the past 30 years (each trailing 2015 which was several degrees warmer).



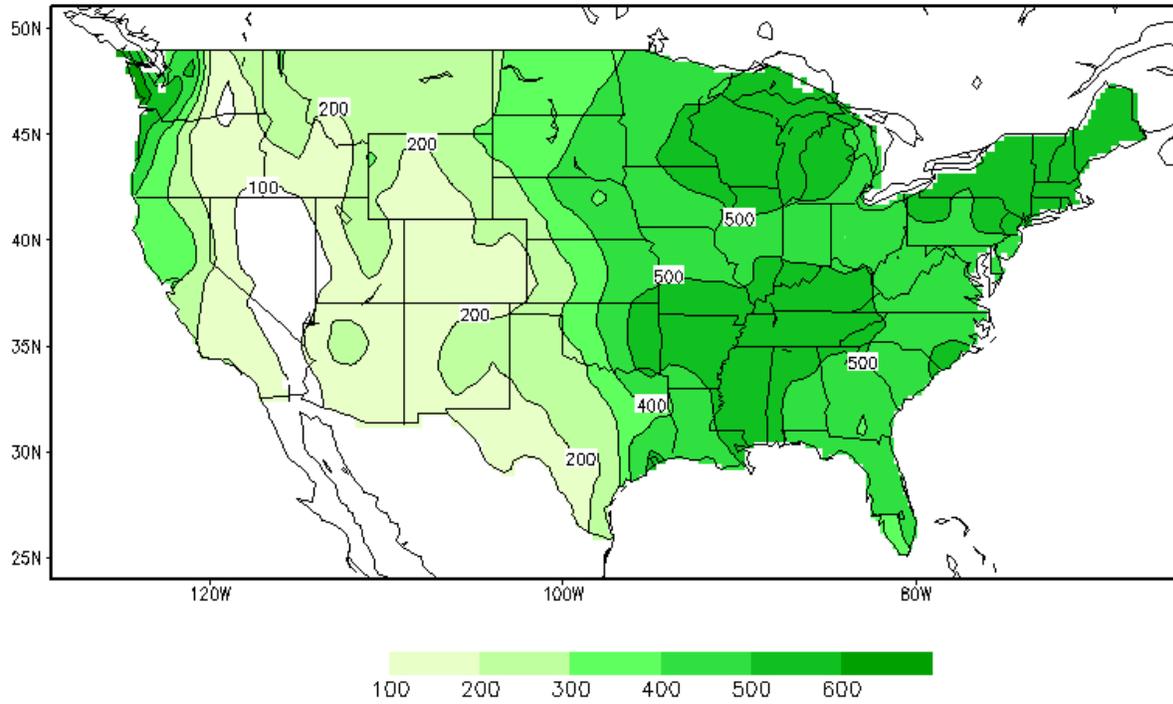




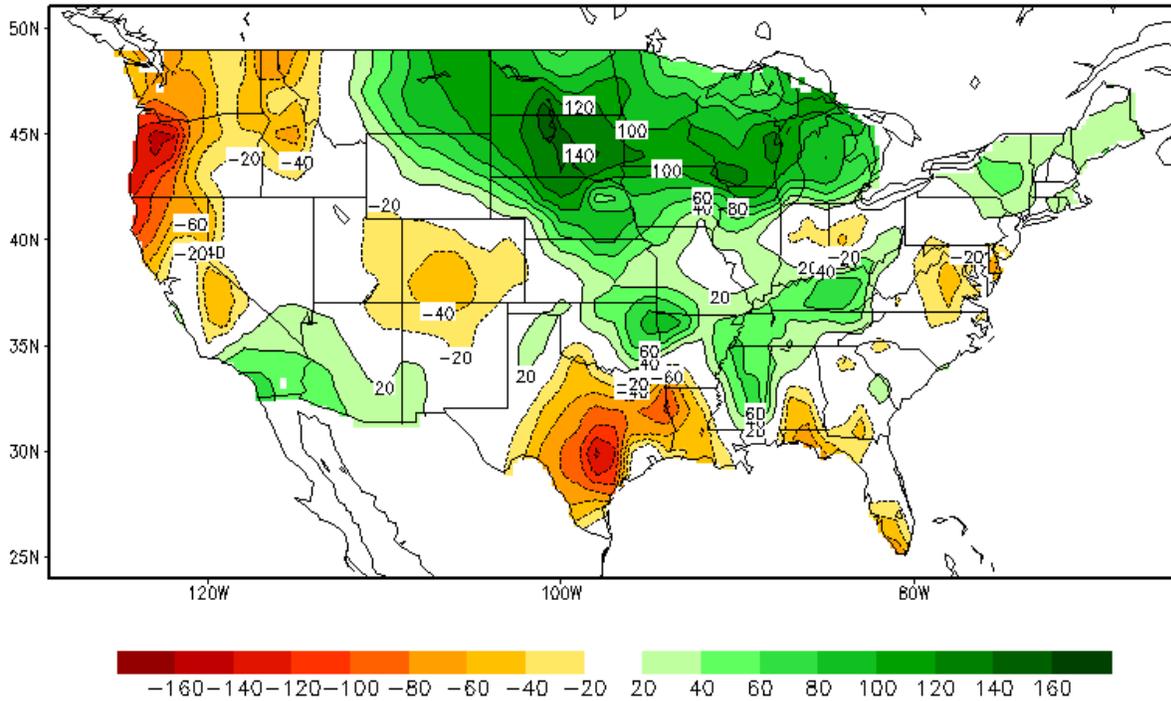
**Soil Moisture:**

Average soil moisture levels were above 500mm across the state for the month, which was above normal for all areas, except extreme southeastern portions of the state. However, due to the below normal precipitation levels in West Tennessee, soil moisture levels dropped over the month; most notably in the northwest corner of the state. For Middle and East Tennessee, soil moisture levels increased by 10 to 40mm through the month.

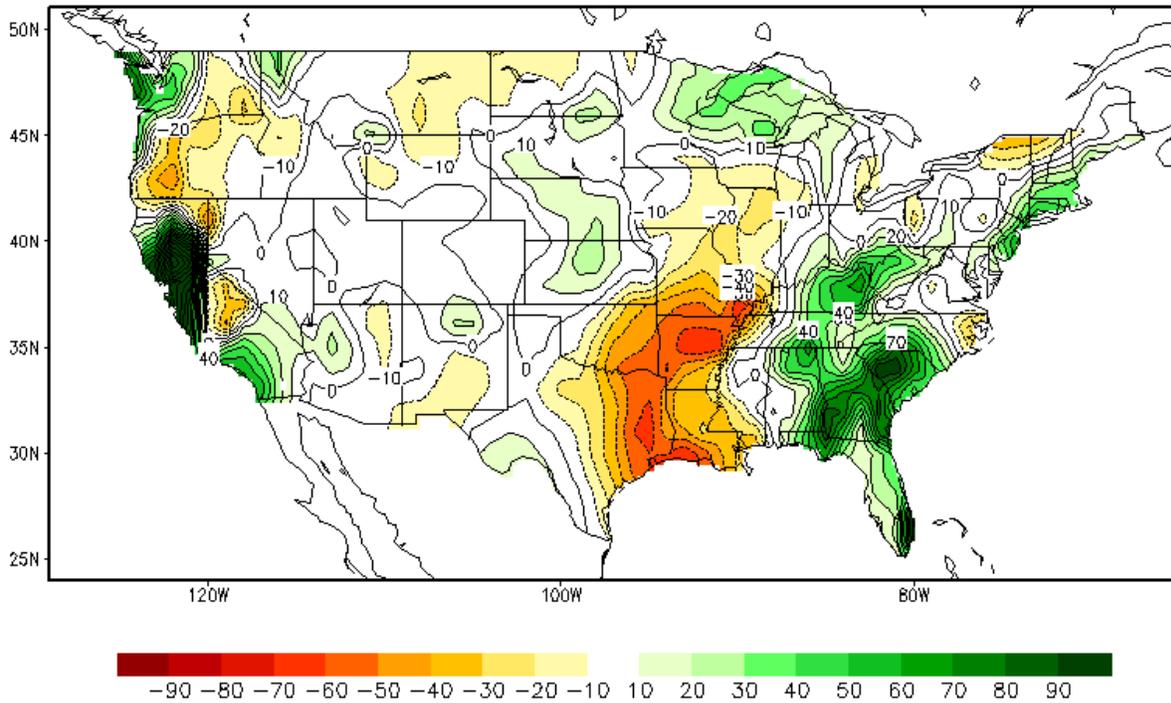
Calculated Soil Moisture (mm)  
DEC, 2019



### Calculated Soil Moisture Anomaly (mm) DEC, 2019



### Calculated Soil Moisture Anomaly Change DEC 30, 2019 from NOV.30



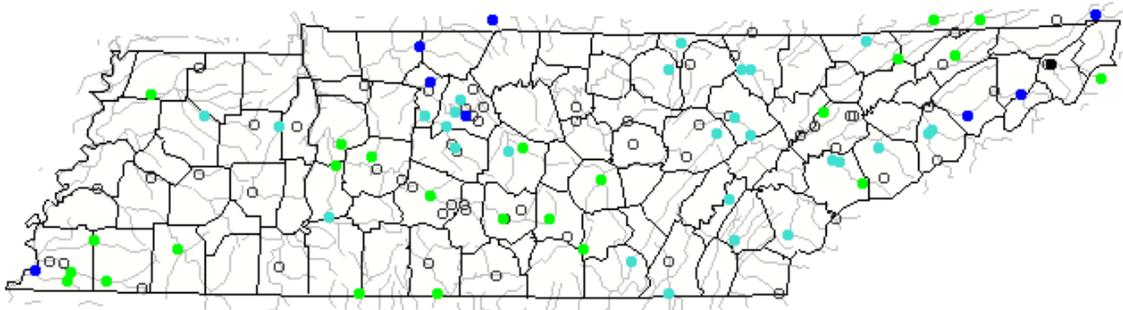
**Streamflow:**

Due to the above normal rainfall in the eastern portions of the state, along with above normal soil moisture, streams across the state reported normal to above normal streamflow. Several gauges in northeast Tennessee, and around Nashville in northern Middle Tennessee reported ‘much above normal’ streamflow for the month.

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

Tennessee ▼ or Water-Resources Regions ▼

December 2019



Search USGS streamgage 🔍

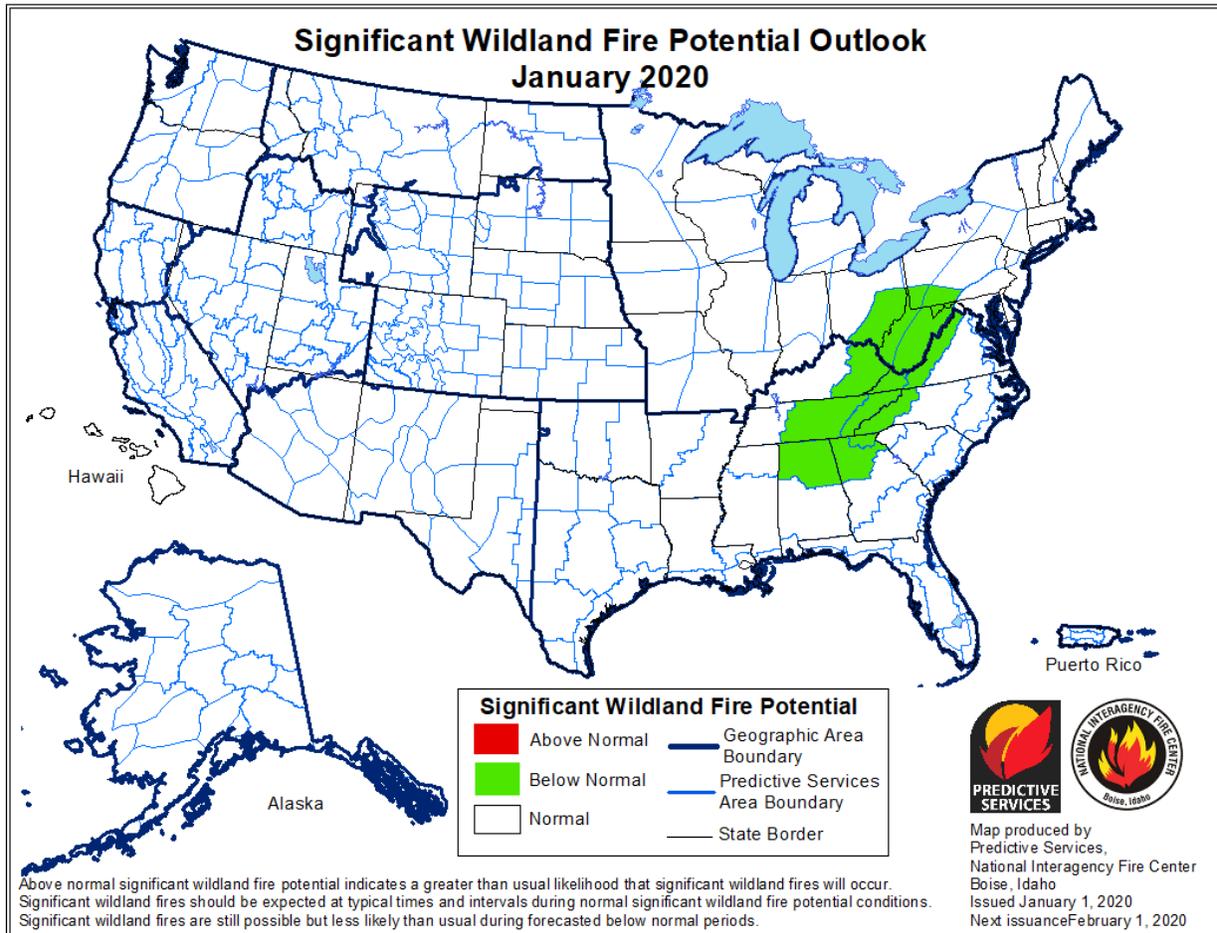
- Choose a data retrieval option and select a location on the map
- List of all stations
  - Single station
  - Nearest stations
  - Peak flow

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

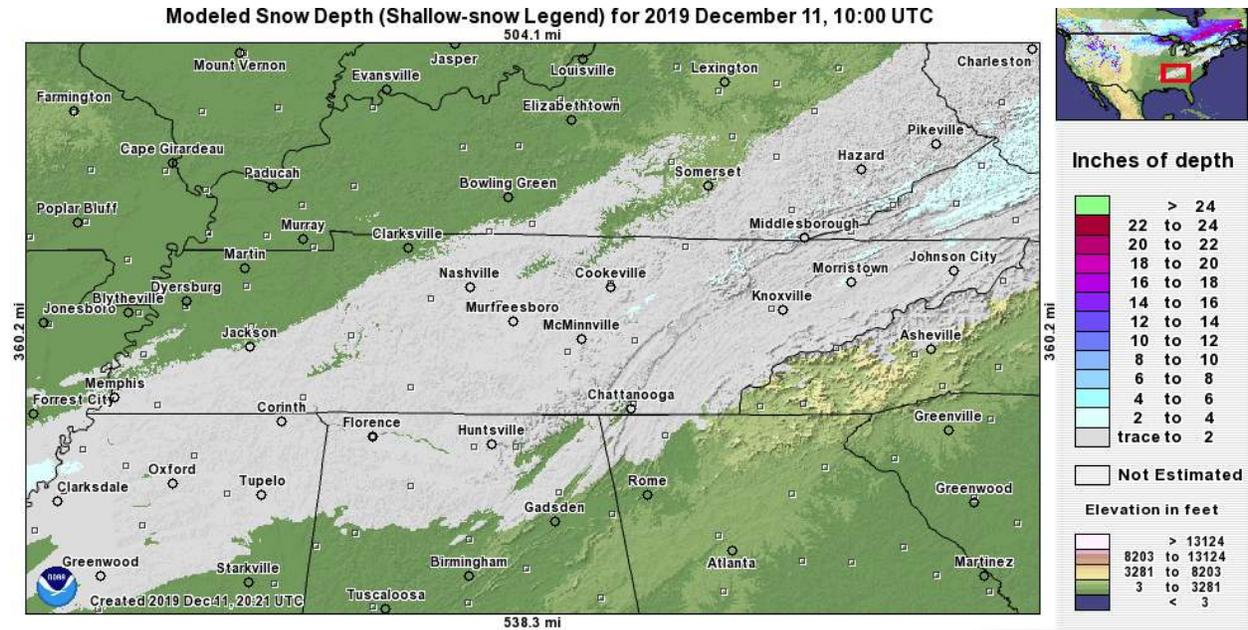
Miscellaneous:

**Crop Conditions from USDA:** Crop progress and condition reports have ended for the year, and the USDA will resume issuing the reports for the state in April 2020.

**Fire Danger:** Due to the above normal precipitation in the eastern two thirds of the state, the Interagency Fire Center wildland fire potential forecast shows that Middle and East Tennessee will have below normal potential for significant wildland fires, while West Tennessee is expected to have normal potential.



**Snow:** Snowfall occurred on the 2<sup>nd</sup> – 3<sup>rd</sup> (mainly confined to the Cumberland Plateau and the East Tennessee mountains), and on the 10<sup>th</sup> – 11<sup>th</sup> (which produced snowfall south and east of the I-40 Corridor from Memphis to Jackson in West Tennessee, and over most of Middle and East Tennessee; see map below).



### Story of the Month:

The major story of December 2019 was the warm end to the month, preceding a large frontal system that brought flooding rains and even some severe weather to wrap up the year.

Temperatures across the state were above normal for most of the month, with the last two weeks of the month bringing temperatures to 8-10°F warmer than normal. In fact, many areas across the state recorded high temperatures that were around 20°F above normal on Christmas, and December 29<sup>th</sup> brought record high and low temperatures to some cities in Middle and East Tennessee. Oak Ridge, Bristol/Tri-Cities, and Knoxville all reached the 70's, with Knoxville topping out at 78°F, the warmest temperature of the month across the state! The 29<sup>th</sup> also brought record high, low temperatures, with Clarksville, Bristol/Tri-Cities, Oak Ridge, and Crossville staying in the 50's overnight, and Chattanooga only getting down to a minimum temperature of 62°F!



US National Weather Service Nashville Tennessee



24 December 2019 at 07:31 - 🌐

Temperatures are expected to be near 70 degrees today! That's 20 degrees warmer than normal. It may not feel like a typical Christmas Eve out there, but we hope it's a great day for everyone no matter how you're spending it. We suggest cooking out, getting a tan, making snow cones on the back porch...any outdoor activity really. However, we also condone staying inside, drinking hot chocolate and pretending it's cold. What are your plans for this warm December day?



Facebook post from NWS Nashville showing a string of warm days from Christmas Eve.



**US National Weather Service Memphis Tennessee**



25 December 2019 at 14:19 · 🌐

Here are the temperatures across the Mid-South as of 1p.m. this Christmas Day. The four climate sites (Memphis, Jackson, Jonesboro, and Tupelo) have a temperature that will place today in the top 10 Christmas Day's for max temperature.

If the current temperatures are the highs for the climate site this is where each site will place:

Memphis: at 68 would be the 8th warmest.

Jackson: at 66 would be the 5th warmest.

Jonesboro: at 64 would be the 8th warmest.

Tupelo: at 70 would be the 7th warmest.

Current Temps (°F)			
Aberdeen, MS	70	Blytheville, AR	68
Bolivar, TN	70	Camden, TN	68
Clarksdale, MS	68	Chickasaw State Park	67
Corning, AR	64	Coffeetown, MS	68
Greenfield, TN	71	Covington, TN	72
Huntingdon, TN	70	Harrisburg, AR	64
Jonesboro, AR	64	Jackson, TN	66
Memphis, TN	68	Juka, MS	67
Oxford, MS	68	Kennett, MO	66
Saltillo, MS	40	Millington, TN	70
Shiloh, TN	70	Paris, TN	68
Tunica, MS	64	Savannah, TN	70
		Somerville, TN	70
		Tupelo, MS	70
		West Memphis, AR	66
		Union City, TN	70

*Temperatures and ranking of Christmas Day warmth from the NWS Memphis Office*



**US National Weather Service Nashville Tennessee**



25 December 2019 at 15:26 · 🌐

As of 2:20 PM, Nashville has not hit 70 degrees. If we do, it will only be the 7th time Christmas hit 70 or greater (since temps started being recorded in Dec 1873). That's less than we've seen accumulating snow on Christmas, which has been measurable (0.1" or greater) 10 times!

*Facebook Post from NWS Nashville about Christmas Day Warmth, Nashville's high on Dec. 25<sup>th</sup> topped out at 69, but Clarksville and other locations in Middle TN did reach the 70°F mark.*



Christmas Day high temperature forecasts in East Tennessee.



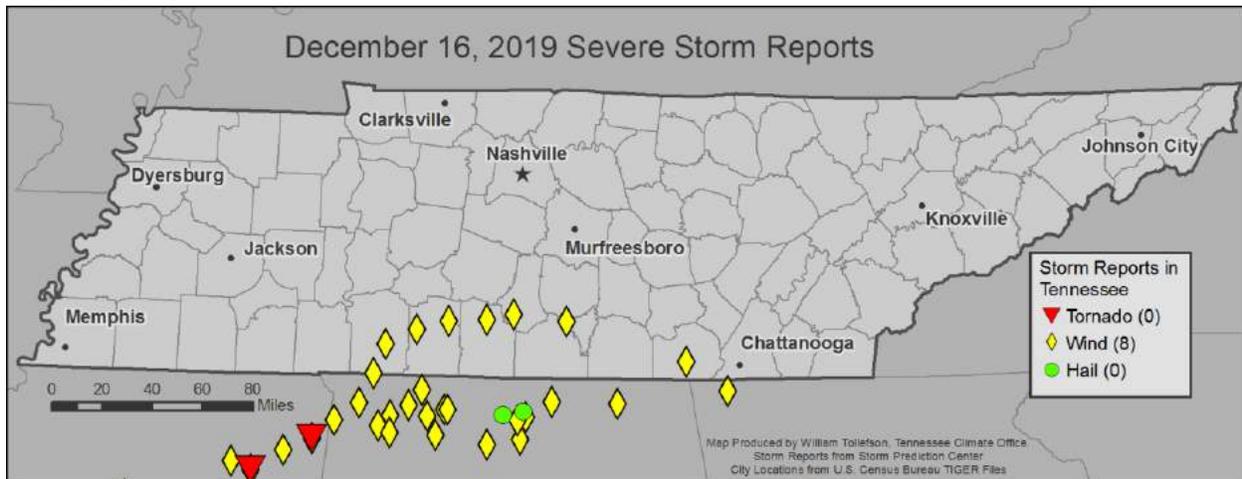
The warmth continues on Dec 28<sup>th</sup> in Middle Tennessee.



### Storm Reports:

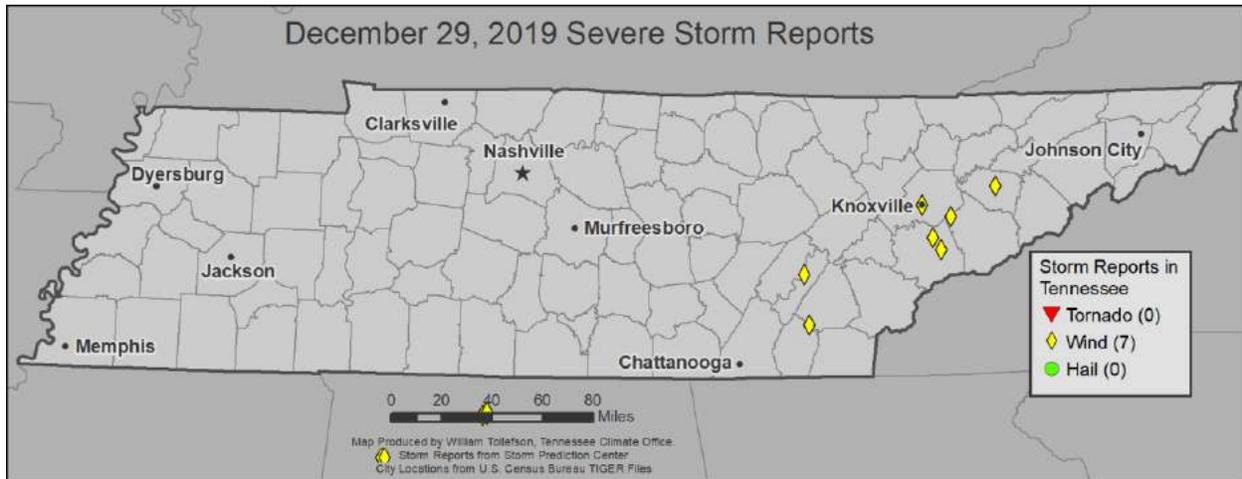
There were two days with severe storm reports in December, with a total of 15 severe wind damage reports, including two injuries which occurred on the 29<sup>th</sup> when severe winds rolled a mobile home, producing minor injuries to the two occupants.

#### December 16:



Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
22:42	--	12 SE LUTTS	WAYNE	35.01	-87.82	911 REPORTED TREES DOWN IN CYPRESS INN ON PINEY ROAD. ALSO SEVERAL REPORTS OF WATER OVER ROADS BUT NO ROAD CLOSURES. (OHX)
22:42	--	COLLINWOOD	WAYNE	35.18	-87.74	REPORT OF SEVERAL TREES DOWN ON SOUTH ROAD. ALSO A FEW TREE LIMBS. TIME ESTIMATED VIA RADAR. (OHX)
22:57	--	10 W LAWRENCEBURG	LAWRENCE	35.27	-87.52	TREES DOWN ACROSS HOOD ROAD AND PINEY ROAD (OHX)
23:11	--	ETHRIDGE	LAWRENCE	35.32	-87.3	TREES DOWN ACROSS GWINN ROAD (OHX)
23:26	--	9 N PULASKI	GILES	35.33	-87.03	ROOF BLOWN OFF OF BARN ON MILKY WAY ROAD NORTH OF PULASKI (OHX)
23:42	--	CORNERVILLE	MARSHALL	35.36	-86.84	RECEIVED A REPORT OF SEVERAL TREES DOWN ACROSS THE ROAD. SEVERAL POWER OUTAGES. ONE MOBILE HOME DAMAGED BY A FALLEN TREE. TIME ESTIMATED VIA RADAR. (OHX)
0:05	--	7 WNW LYNCHBURG	MOORE	35.32	-86.47	TREES REPORTED DOWN ON BAGLEY HOLLOW ROAD. (HUN)
1:15	--	2 N JASPER	MARION	35.09	-85.63	SHINGLES BLOWN OFF OF STRUCTURE. (MRX)

December 29:



Time (UTC)	Speed (mph)	Location	County	Lat	Lon	Comments
5:02	--	4 N DECATUR	MEIGS	35.58	-84.79	*** 2 INJ *** THUNDERSTORM WINDS ROLLED A MOBILE HOME WITH TWO OCCUPANTS... BOTH SUFFERED MINOR INJURIES. (MRX)
5:16	--	CHARLESTON	BRADLEY	35.29	-84.76	SPOTTER REPORTED TREES DOWN AND POWER OUTAGE IN CHARLESTON AND HAD A WIND GUST OF 48 MPH AT HIS HOUSE. (MRX)
6:10	72	5 NW WALLAND	BLOUNT	35.78	-83.88	MEASURED 72 MPH THUNDERSTORM WIND GUST. (MRX)
6:10	60	KNOXVILLE	KNOX	35.97	-83.95	SPOTTER ESTIMATED 60 MPH THUNDERSTORM WIND GUST. (MRX)
6:18	--	2 NE SEYMOUR	SEVIER	35.9	-83.75	HAM ANTENNA DOWNED AND GAZEBO DAMAGED BY THUNDERSTORM WINDS. (MRX)
6:27	--	1 S WALLAND	BLOUNT	35.71	-83.82	THUNDERSTORM WINDS DOWNED A TREE AND UTILITY POLE... CLOSING OLD WALLAND HIGHWAY SOUTH OF WALLAND. (MRX)
6:43	--	4.7 SE JEFFERSON CITY	JEFFERSON	36.07	-83.43	THUNDERSTORM WINDS KNOCKED DOWN A LARGE TREE... BLOCKING BROTHERTON RD. (MRX)

### CPC Outlooks for the Next Month:

The Climate Prediction Center outlooks for January indicate that Tennessee, along with the southeastern portion of the country, will likely experience above normal temperatures for the month. Additionally, most of the eastern third of the country is likely to experience above normal precipitation. The highest confidence in above normal precipitation is centered on Middle and East Tennessee with over a 50% likelihood of above normal precipitation continuing into the start of 2020.

