

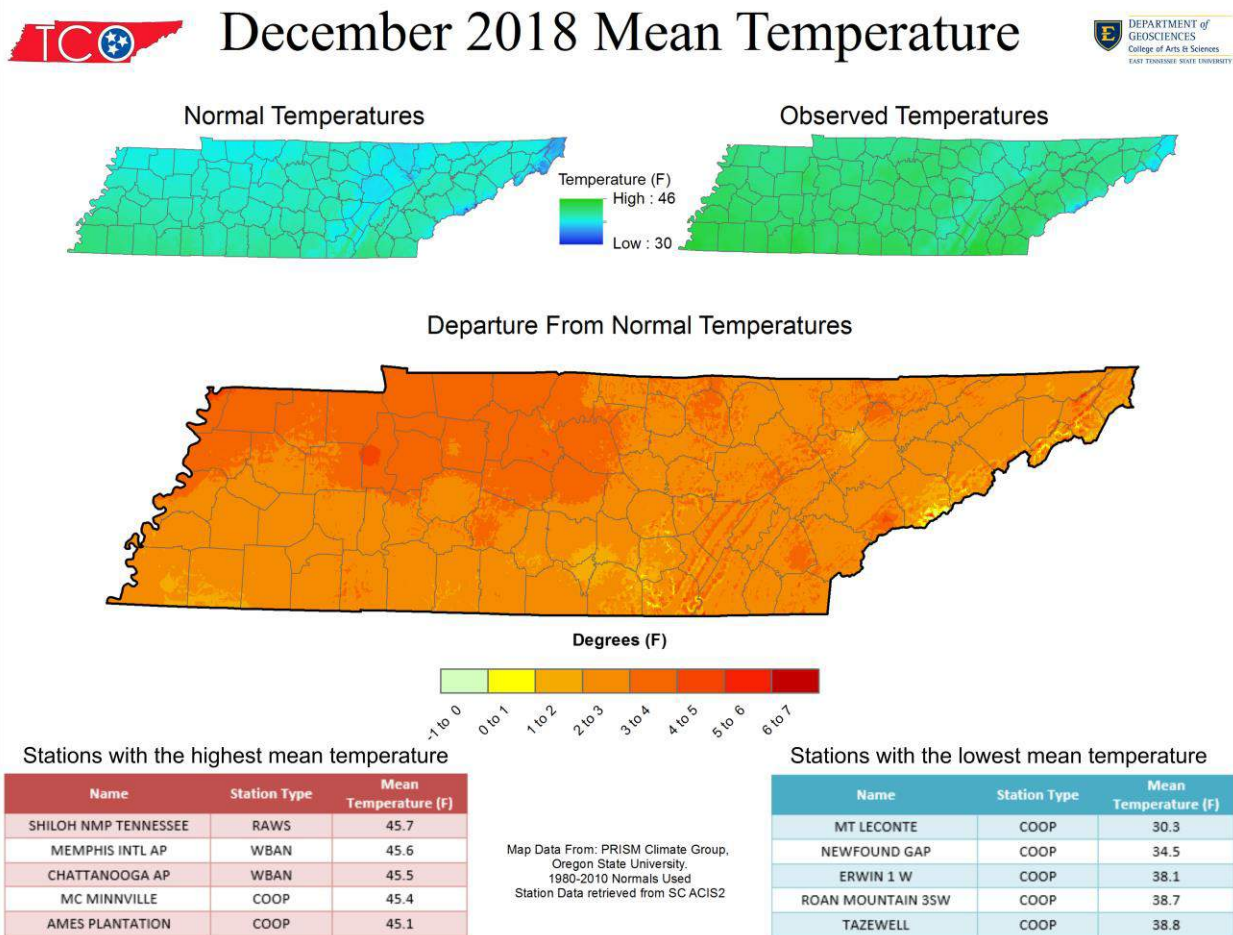
December 2018 Tennessee Climate Summary

Prepared by William Tollefson and Dr. Andrew Joyner

Tennessee Climate Office * East Tennessee State University

Monthly Temperature Summary:

Mean temperatures were above normal for most parts of the state, with the northwest observing the warmest anomalies (widespread 3-4 degrees above normal for the month). These temperature anomalies would be much higher, if not for a cold snap that arrived with a Gulf Coast storm in the second week of the month when many areas across the state recorded temperatures 6-8 degrees colder than normal for the week (6th-12th). The month also ended on a warm note, as warm air moved in behind a warm front and brought temperatures to the upper 60's and 70's. The Bristol/Tri-Cities Airport set their record high for New Year's Eve, with a high temperature of 75°F, the Morristown and Nashville NWS Office weather stations also recorded their warmest NYE with a high of 72 °F and 66 °F, respectively.



Monthly Precipitation Summary:

Precipitation was generally at or above normal; with some areas in northern Middle and West Tennessee slightly below normal (in the 75-100% normal range). Eastern parts of the state (from southeastern Hamilton County to Monroe County) recorded the most precipitation with many areas closing in on a foot! Otherwise, the highlands of Johnson and Carter Counties in northeast Tennessee recorded the most above normal precipitation, with some areas recording over 250% of normal! Each week of the month storm systems produced rainfall across the state, with a varied pattern resulting in many locations going from a generally dry week to a wet week and then back to dry. The second week of December brought a strong Gulf-Coast storm that produced widespread heavy rains in the southern parts of the state, and significant snowfall to the mountains and northeast Tennessee. The Bristol/Tri-Cities airport set a record for single-day December snowfall on Dec 9th with 9.1 inches of snowfall. Heavy rainfall occurred at the end of the month for most parts of the state (with totals over 3"), which led to flood concerns on rivers in Middle and West TN, as well as rivers in East TN which have headwaters in western North Carolina.

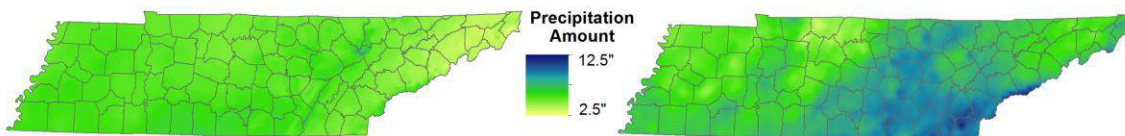


December 2018 Precipitation

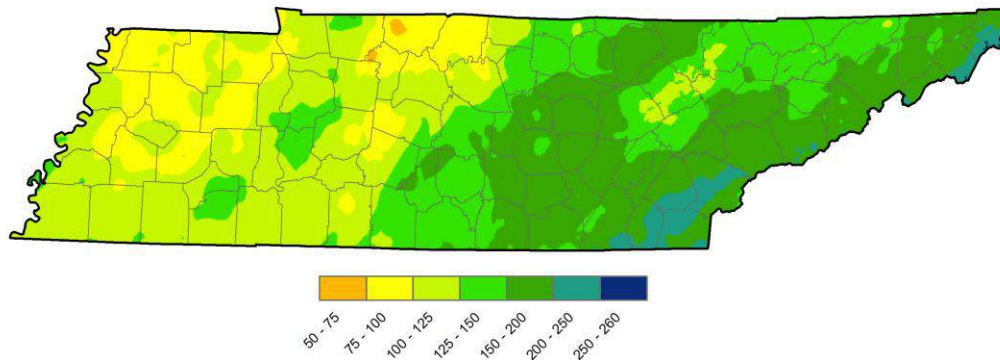


Normal Precipitation

Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Name	Station Type	Total Precipitation (in)
BENTON 2.3 ESE	CoCoRaHS	13.43
MT LECONTE	COOP	11.83
SEWANEE	COOP	11.49
NEWFOUND GAP	COOP	11.27
OLTEWAH 3.0 SW	CoCoRaHS	11.15

Map Data From: PRISM Climate Group,
Oregon State University,
1980-2010 Normals Used
Station Data retrieved from SC ACIS2

Stations with the least precipitation

Name	Station Type	Total Precipitation (in)
CLARKSBURG 5.6 E	CoCoRaHS	2.94
CLARKSVILLE 14.4 WSW	CoCoRaHS	3.04
ANTIOCH 4.3ENE	CoCoRaHS	3.07
CHEATHAM LOCK & DAM	COOP	3.2
BERRY HILL 1.6 WNW	CoCoRaHS	3.21

Top Tenn (warmest, coldest, wettest, driest stations of the month):

Hottest Stations (highest max temp):

Name	Station Type	Max Temperature (F)
BRISTOL AP	WBAN	75
NEWPORT 1 NW	COOP	75
GERMANTOWN 4SE	COOP	75
CHATTANOOGA AP	WBAN	74
MEMPHIS WFO	WBAN	74
MILAN EXP STN	COOP	74
KINGSPORT	COOP	74
MEMPHIS INTL AP	WBAN	73
KNOXVILLE AP	WBAN	73
BROWNSVILLE	COOP	73
JACKSON EXP STA	COOP	73

Coldest Stations (lowest min temp):

Name	Station Type	Lowest Temperature (F)
NORRIS	COOP	3
MT LECONTE	COOP	8
ROAN MOUNTAIN 3SW	COOP	12
JACKSON EXP STA	COOP	13
NEWFOUND GAP	COOP	13
BRISTOL AP	WBAN	14
DICKSON	COOP	15
ALLARDT	COOP	15
TAZEWELL	COOP	15
BRENTWOOD	COOP	15
GLADEVILLE	COOP	15
WHITE HOUSE	COOP	15

Warmest Stations (highest mean temps):

Name	Station Type	Mean Temperature (F)
SHILOH NMP TENNESSEE	RAWS	45.7
MEMPHIS INTL AP	WBAN	45.6
CHATTANOOGA AP	WBAN	45.5
MC MINNVILLE	COOP	45.4
AMES PLANTATION	COOP	45.1
NASHVILLE INTL AP	WBAN	45
ARDMORE	COOP	45
NEWPORT 1 NW	COOP	44.5
GERMANTOWN 4SE	COOP	44.5
FAYETTEVILLE WATER PLANT	COOP	44.3
OAK RIDGE ASOS	WBAN	44.3
ROCK ISLAND STATE PARK	COOP	44.3

Coollest Stations (lowest mean temps):

Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	30.3
NEWFOUND GAP	COOP	34.5
ERWIN 1 W	COOP	38.1
ROAN MOUNTAIN 3SW	COOP	38.7
TAZEWELL	COOP	38.8
ROGERSVILLE 1 NE	COOP	39.1
JAMESTOWN	COOP	39.3
NORRIS	COOP	40
COALMONT	COOP	40
CROSSVILLE 7 NW	WBAN	40

Wettest Stations (highest rainfall totals):

Name	Station Type	Total Precipitation (in)
BENTON 2.3 ESE	CoCoRaHS	13.43
MT LECONTE	COOP	11.83
SEWANEE	COOP	11.49
NEWFOUND GAP	COOP	11.27
OLTEWAH 3.0 SW	CoCoRaHS	11.15
COALMONT	COOP	11.13
MONTEAGLE	WBAN	11.1
MCMINNVILLE 8.5 ESE	CoCoRaHS	10.97
CLEVELAND 5.2 SE	CoCoRaHS	10.94
CLEVELAND 3.0 ESE	CoCoRaHS	10.6

Driest Stations (lowest rainfall totals):

Name	Station Type	Total Precipitation (in)
CLARKSBURG 5.6 E	CoCoRaHS	2.94
CLARKSVILLE 14.4 WSW	CoCoRaHS	3.04
ANTIOCH 4.3ENE	CoCoRaHS	3.07
CHEATHAM LOCK & DAM	COOP	3.2
BERRY HILL 1.6 WNW	CoCoRaHS	3.21
CLARKSVILLE 13.5 SSE	CoCoRaHS	3.42
GREEN HILL 3.1 NNE	CoCoRaHS	3.56
GREENBRIER 1.4 N	CoCoRaHS	4.09
PORTLAND SEWAGE PLANT	COOP	4.2
MOUNT JULIET 5.2 SSW	CoCoRaHS	4.24

Snowiest Stations (total monthly snowfall):

Name	Station Type	Total Snowfall (in)
MT LECONTE	COOP	26.2
NEWFOUND GAP	COOP	15.6
ROAN MOUNTAIN 3SW	COOP	14.3
BRISTOL AP	WBAN	10.8
KINGSPORT	COOP	8.8
GREENEVILLE EXP STA	COOP	5.1
ELIZABETHTON	COOP	4.9
MORRISTOWN WFO	COOP	3.3
MORRISTOWN RADIO WCRK	COOP	3.2
MCMINNVILLE 8.5 ESE	CoCoRaHS	2.5

An additional 10 stations reported measurable snowfall, and 14 more reported trace amounts of snow during the month of December.

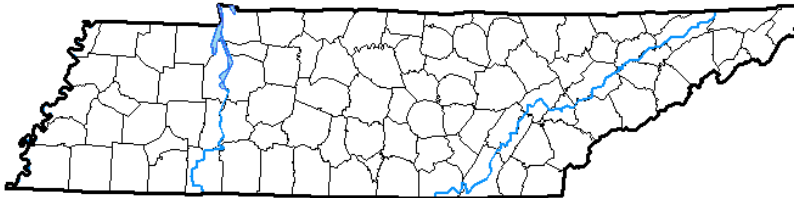
Drought Monitor:

As of the last drought monitor report of the month (Dec 25th), Tennessee was drought free, and there were no drought conditions reported in Tennessee during the month of December.






U.S. Drought Monitor Tennessee

Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

December 25, 2018
(Released Thursday, Dec. 27, 2018)
Valid 7 a.m. EST



Intensity:

-  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. See accompanying text summary for forecast statements.

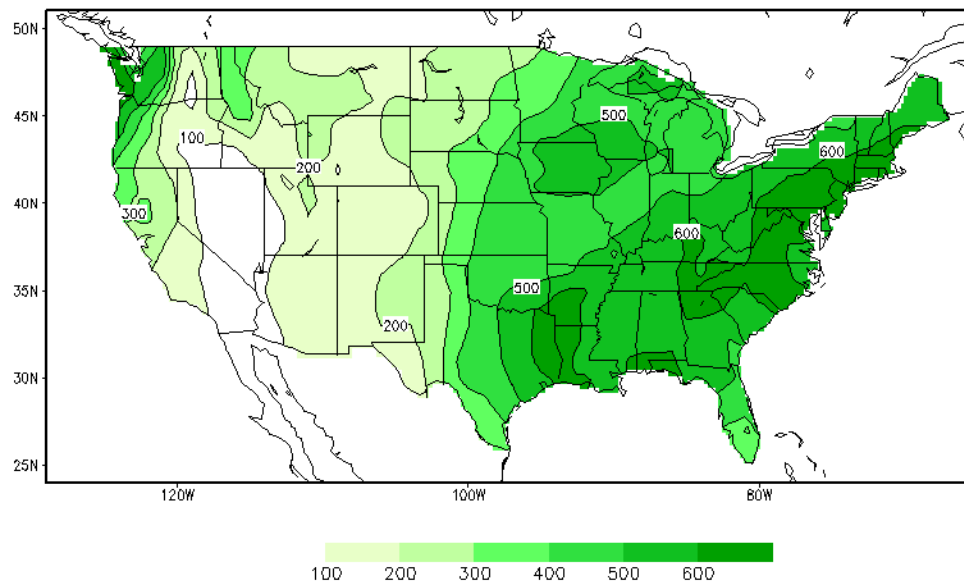
<http://droughtmonitor.unl.edu/>



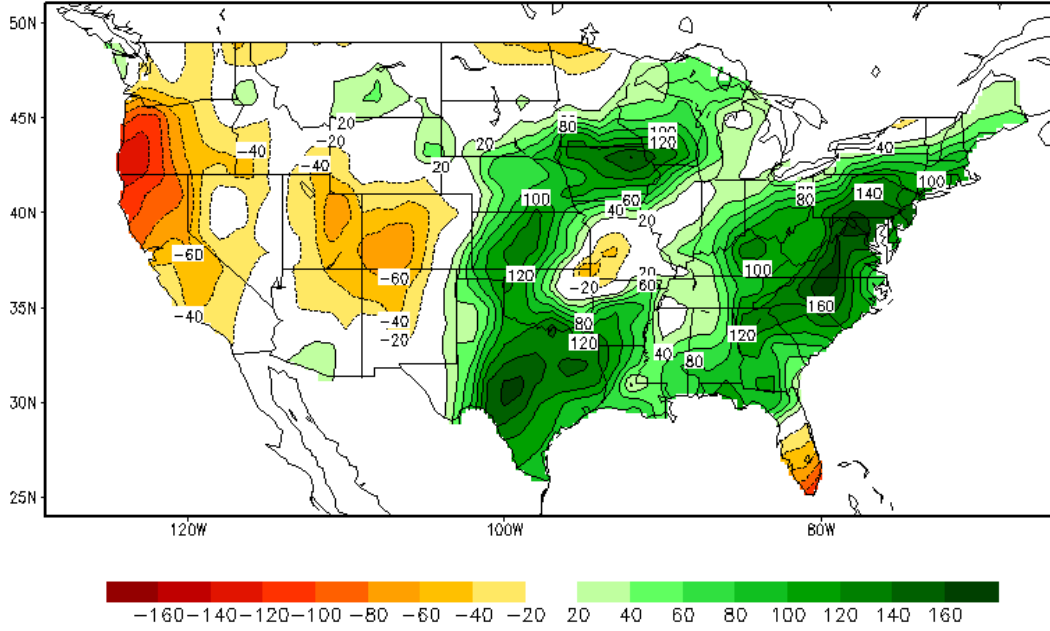
Soil Moisture:

The mean soil moisture for the month ranged from over 500 to above 600mm, which was at or above normal for the whole state.

Calculated Soil Moisture (mm)
DEC, 2018



Calculated Soil Moisture Anomaly (mm) DEC, 2018



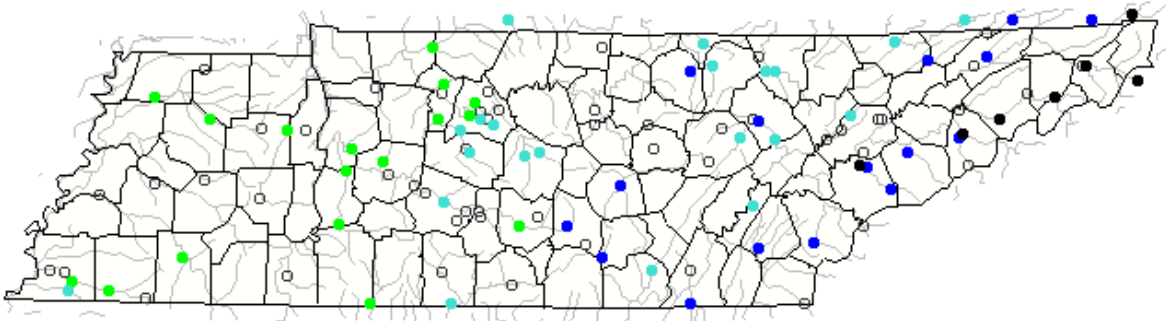
Streamflow:

Monthly stream flow averaged normal to above normal for the state, with the eastern half showing the above normal conditions.

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

Tennessee ▼ or Water-Resources Regions ▼

December 2018



Search USGS streamgage 🔍

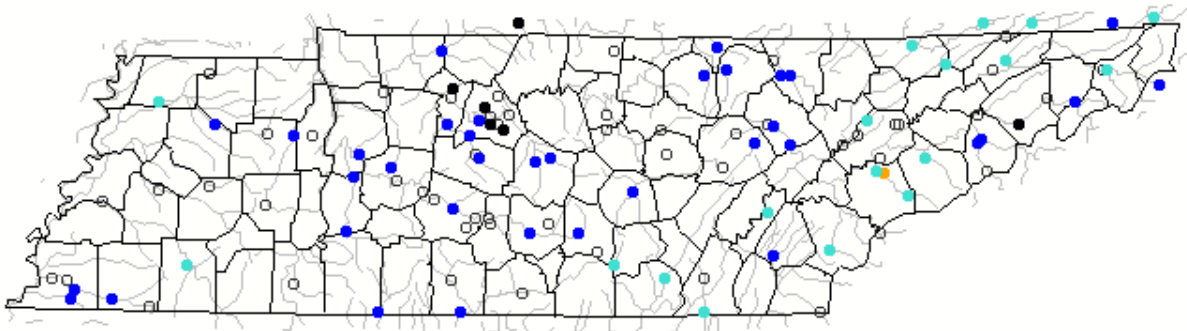
Choose a data retrieval option and select a location on the map

List of all stations
 Single station
 Nearest stations
 Peak flow

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

Widespread heavy rainfall during the last week of the month led to all but one stream gauge reporting above normal flow on January 1st, 2019.

Tuesday, January 01, 2019



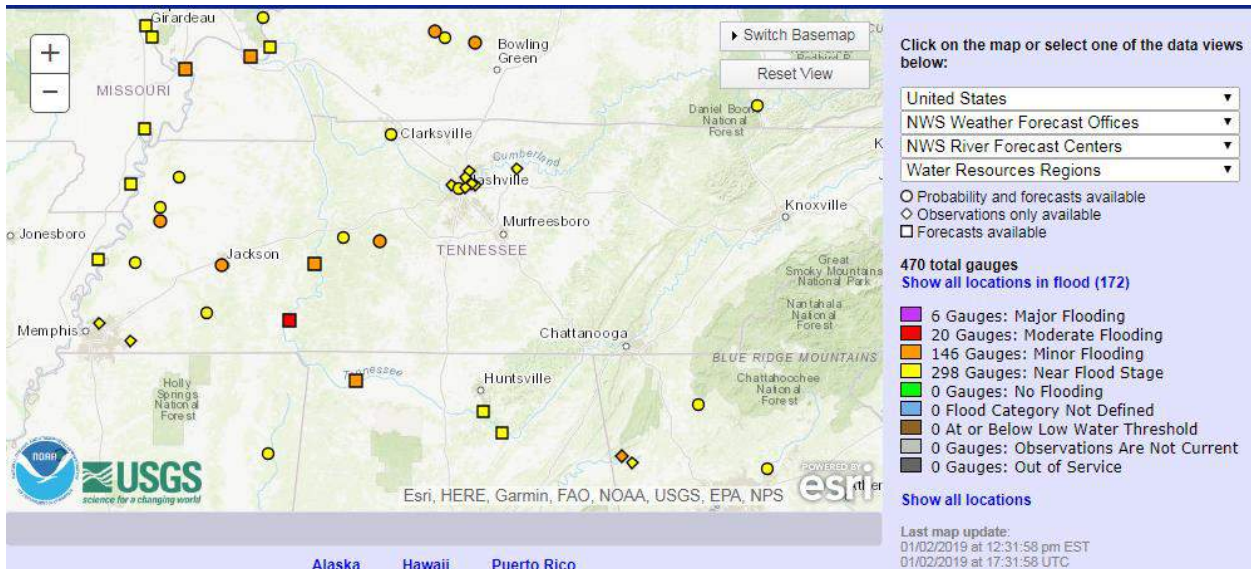
Search USGS streamgage

Choose a data retrieval option and select a location on the map

- List of all stations
 Single station
 Nearest stations
 Peak flow

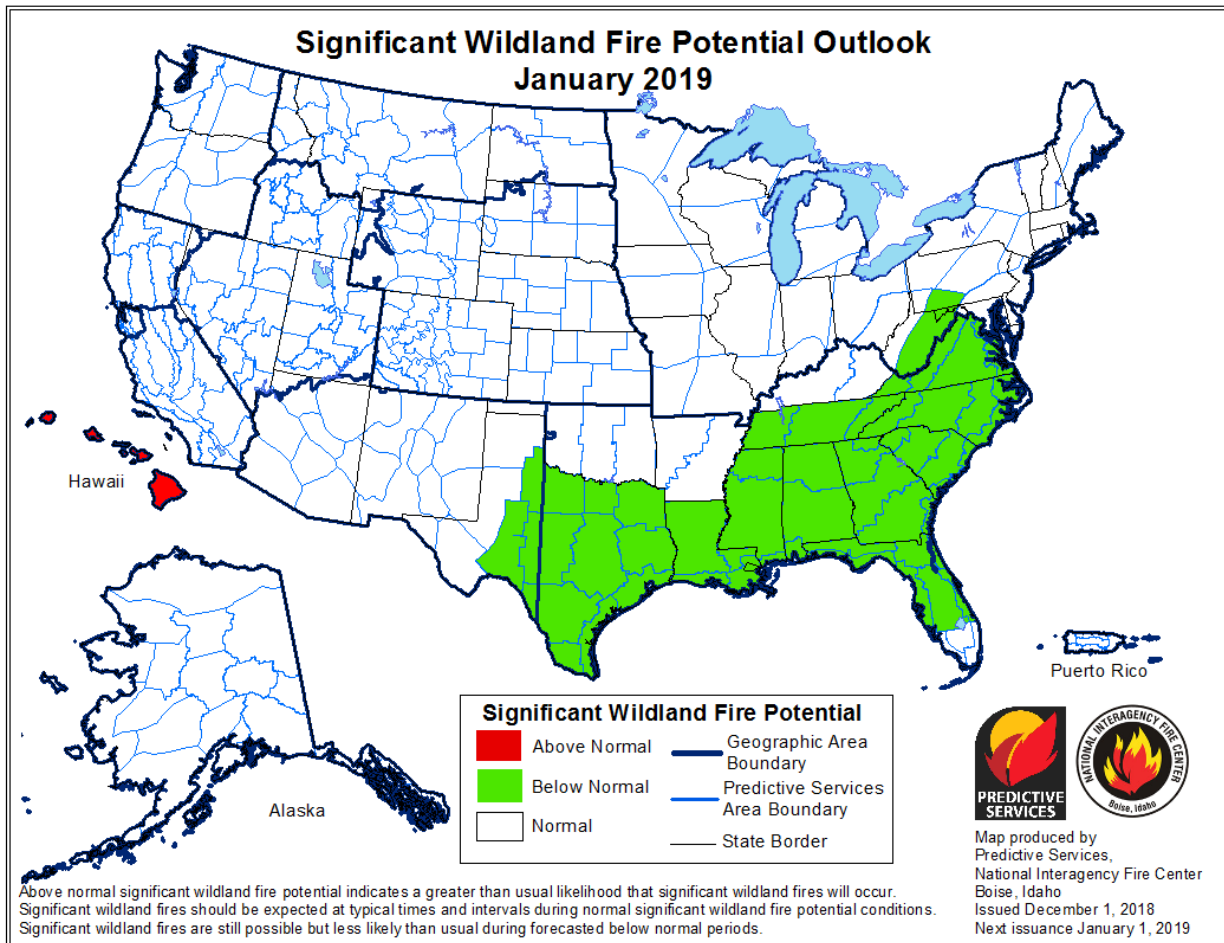
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Additionally there were several streams in Middle and West Tennessee that exhibited flood or near flood conditions. Many of these streams are forecast to stay near or above flood stage for at least the next week.

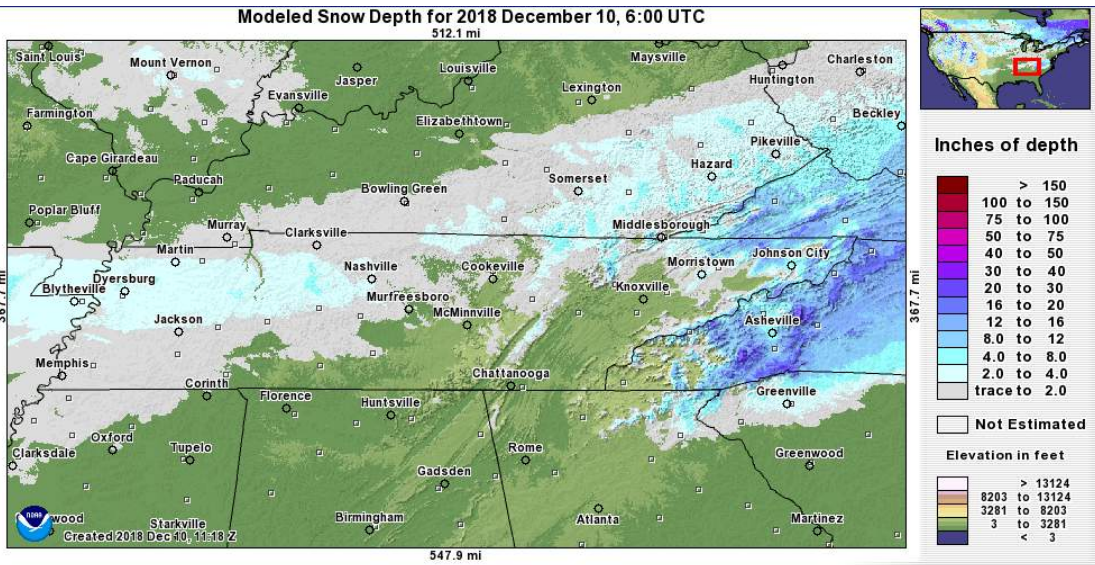


Miscellaneous:

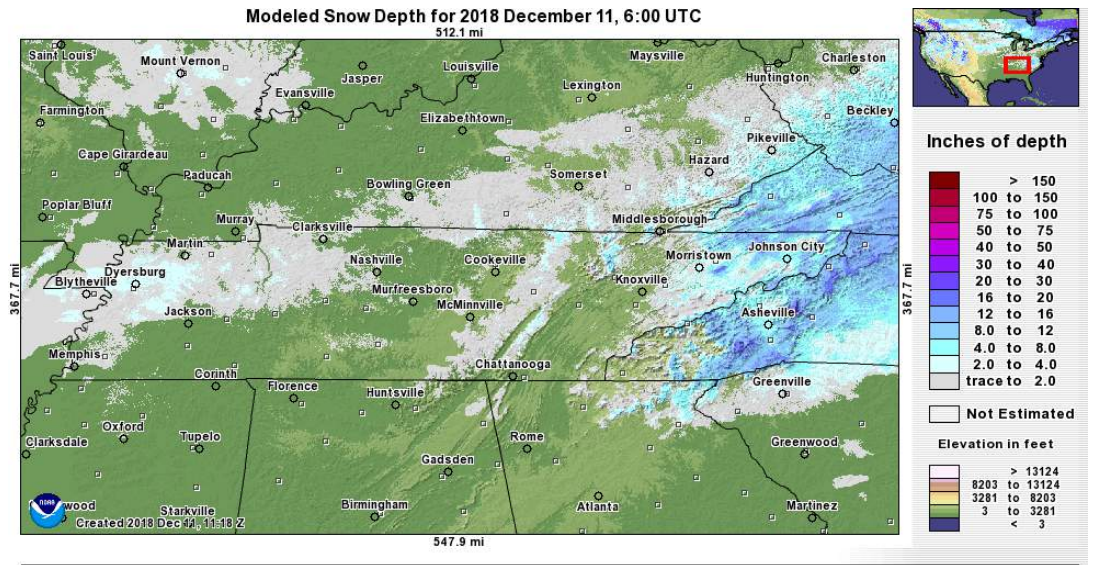
Fire Danger: Due to wet weather, fire danger is forecast to be below normal for the next month.



Snowfall: Snowfall occurred for northern portions of Tennessee from the 8th to the 10th of December. Maps below from the National Snow and Ice Datacenter show the maximum snow coverages on the 10th and 11th. For the week of Dec 6-12th, there were 289 weather stations reporting precipitation in TN, of which 69 stations reported measurable snow (39 recorded over an inch), and an additional 47 stations reported trace amounts. Some locations in NE TN recorded over a foot of snow in this 3-day period! The Tri-Cities Airport broke the record for the snowiest day in December with a total of 9.1 inches on Sunday (12/9), the previous one-day December snowfall record was 8.7" set on December 25, 1969.



• Gridded observed snowfall images, seasonal totals, and data downloads in several formats can now be found on the [National Snowfall Analysis](#) page.



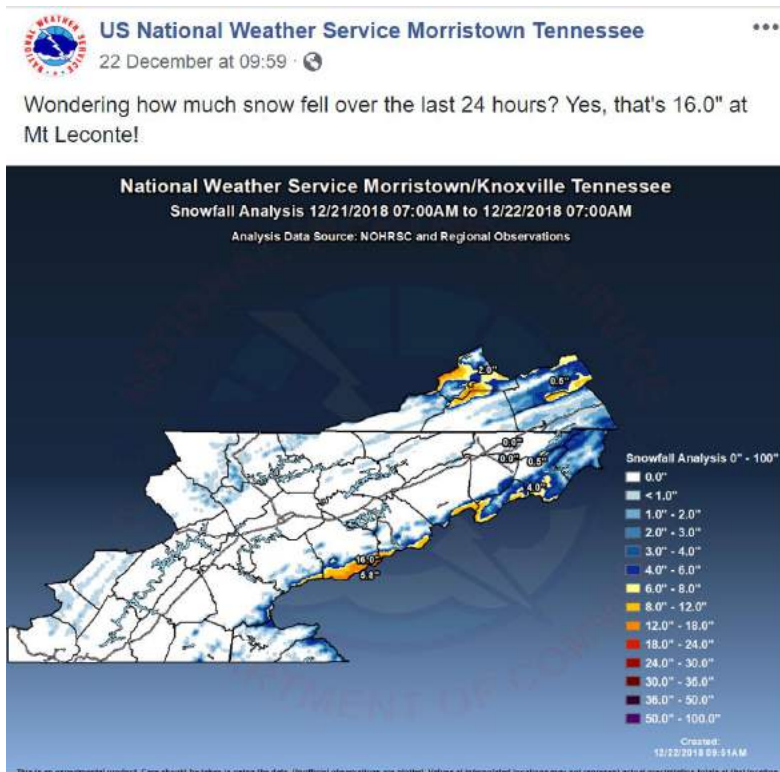
• Gridded observed snowfall images, seasonal totals, and data downloads in several formats can now be found on the [National Snowfall Analysis](#) page.

Data for December 6, 2018 through December 12, 2018

Click column heading to sort ascending, click again to sort descending.

Name	Station Type	Total Snowfall
GRAY 1.5 E	CoCoRaHS	11.5
KINGSPORT 4.3 ENE	CoCoRaHS	11.0
Bristol-Johnson City Area	ThreadEx	10.0
BRISTOL AP	WBAN	10.0
GRAY 1.3 S	CoCoRaHS	10.0
NEWFOUND GAP	COOP	9.8
MT LECONTE	COOP	9.2
OAK GROVE 3.0 E	CoCoRaHS	9.2
CHURCH HILL 3.4 NNE	CoCoRaHS	9.0
KINGSPORT	COOP	8.8
ROAN MOUNTAIN 3SW	COOP	8.7

Another event brought heavy snow to the higher elevations of the mountains in East Tennessee on December 21st and 22nd. Mt LeConte in Great Smoky Mountains National Park recorded 16" of snow! The highest elevations of the Smoky's and northeast Tennessee maintained their snow cover and observed a white Christmas.



Earthquake: A Magnitude 4.4 earthquake rattled East Tennessee on Wednesday Dec. 12th, this was the second strongest recorded quake in east TN. The earthquake occurred at 4:14am EST, with an epicenter near Decatur, TN. Shaking was felt throughout East TN and even as far away as in the Atlanta Metro Area.



NWS Morrystown 
@NWSMorrystown



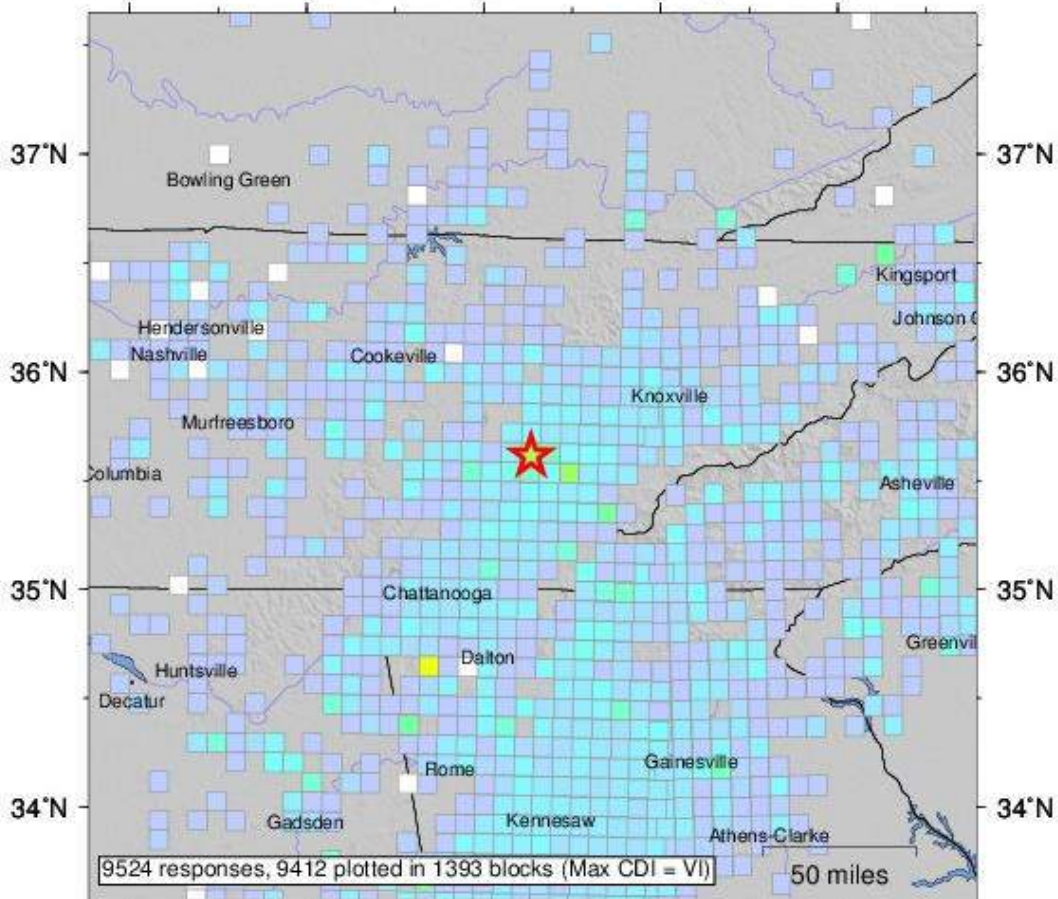
This morning's M4.4 earthquake near Decatur is the second strongest on record in East TN, according to the USGS. The strongest was a M4.7 near Maryville in 1973. #earthquake

♡ 1,099 5:18 AM - Dec 12, 2018



USGS Community Internet Intensity Map EASTERN TENNESSEE

Dec 12 2018 09:14:43 AM UTC 35.6123N 84.732W M4.4 Depth: 7 km ID:se60247871



9524 responses, 9412 plotted in 1393 blocks (Max CDI = VI)

50 miles

	87°W	86°W	85°W	84°W	83°W				
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Processed: Thu Dec 20 19:01:38 2018 vmdyfi1

Story of the month:

The two major stories of the month were the snowstorm of the 8th-10th and the severe weather and flooding at the end of the month, specifically on the 31st.

Snowstorm: As mentioned previously the snowstorm was associated with a strong Gulf-Coast storm and a series of shortwaves in the upper-air patterns that brought cold air and moisture into the northern half of TN. Along the southern border of TN this system produced over 2" of rainfall, but up to a foot of snow in some parts of northeast TN. This storm also set the record for single-day snowfall during the month of

Data for December 6, 2018 through December 12, 2018

Click column heading to sort ascending, click again to sort descending.

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GRAY 1.5 E	CoCoRaHS	11.5
KINGSPORT 4.3 ENE	CoCoRaHS	11.0
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BRISTOL AP	WBAN	10.0
GRAY 1.3 S	CoCoRaHS	10.0
NEWFOUND GAP	COOP	9.8
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OAK GROVE 3.0 E	CoCoRaHS	9.2
CHURCH HILL 3.4 NNE	CoCoRaHS	9.0
KINGSPORT	COOP	8.8
ROAN MOUNTAIN 3SW	COOP	8.7

December for the Bristol/Tri-Cities Airport on Dec. 9th with 9.1" of snow recorded. The night following the snowstorm temperatures dropped into the teens across the region, hard freezing the snow in place, and many areas of northeast TN maintained snow cover until the following Friday (Dec 14th)

The snowstorm also proved fatal, as a pedestrian was killed on I-81 when he was struck by an SUV that was skidding on snow and slush. The man was a truck driver who was walking away from his disabled truck on the side of the interstate.

Additionally a 20-mile stretch of I-81 from Virginia to Tennessee came to a complete standstill for around 18 hours from Sunday into early Monday morning as traffic was stopped when cars near the start of the traffic jam slid off the road or became stuck on the highway.



A view from the Tennessee Climate Office on Tuesday, Dec. 11th

Flooding concerns to end the year: Many rivers in West and Middle Tennessee were near or at flood stage as of the end of the year, with the wide-spread heavy rains that came during the last week of the month. Some rivers in East Tennessee, specifically those whose headwaters are in western North Carolina were also experiencing flooding.



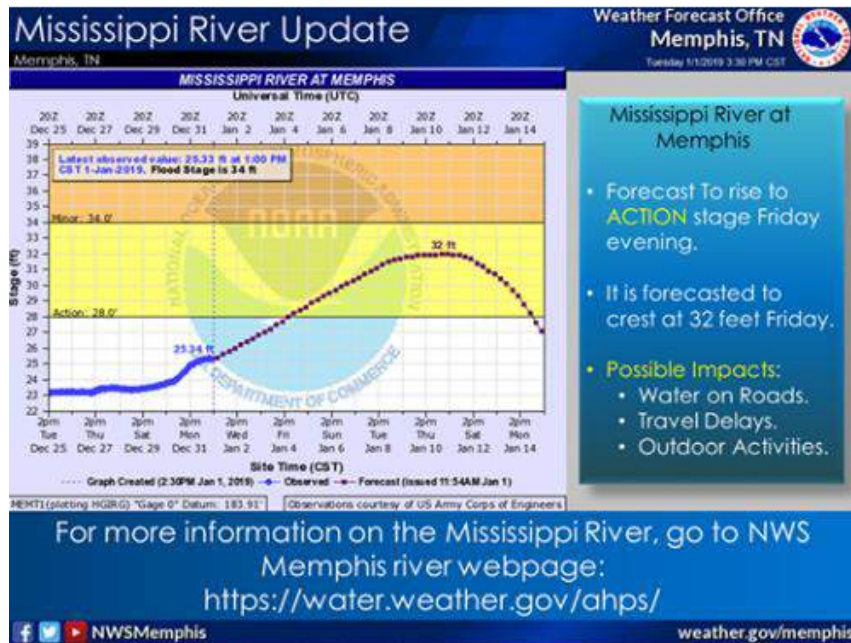
US National Weather Service Memphis Tennessee

1 January at 16:34 · 🌐

As you can tell river stages are up! Here's a look at the Mississippi River at Memphis. Check out the graphic below for more information 📊.

To look at more of these graphs please go to:

<https://water.weather.gov/ahps/>

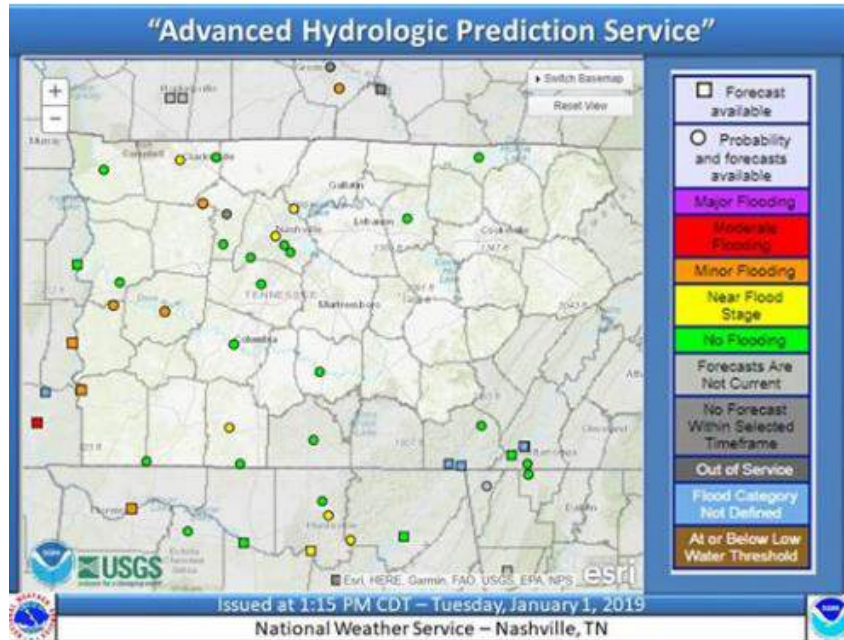




US National Weather Service Nashville Tennessee

1 January at 14:07 · 🌐

With all the rain we had yesterday, those with interest along the rivers need to keep an eye on the AHPS page. All things river and creeks.
<http://ow.ly/WAQi30n9zjH> #riverflooding #rain



US National Weather Service Morristown Tennessee

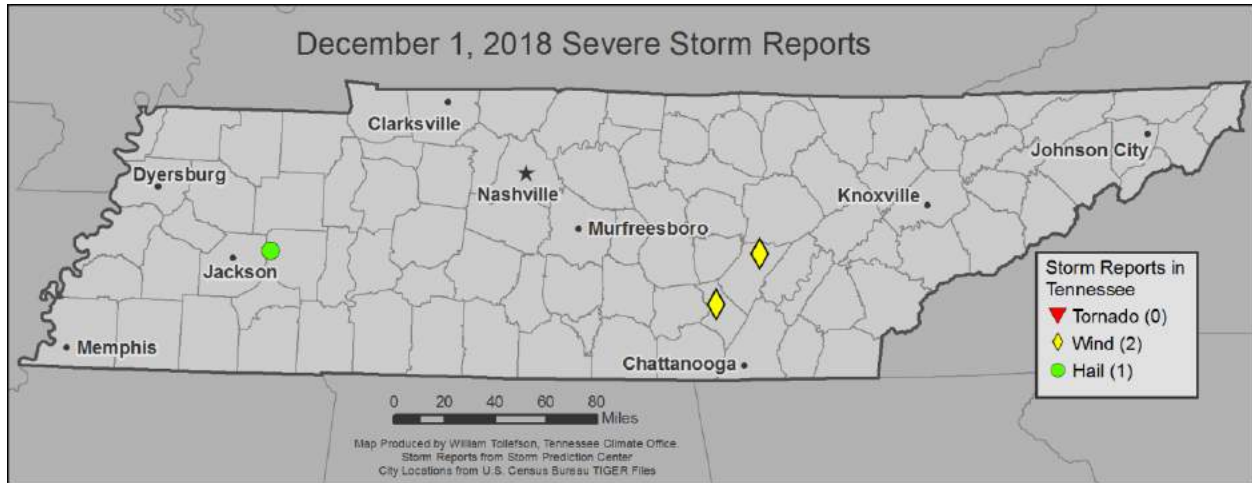
28 December 2018 at 19:00 · 🌐

Major flooding continues for the Pigeon River at Newport. It has crested at 16 feet this evening, but will remain above flood stage through Monday. If you come to a flooded road, turn around, don't drown!



Storm reports:

December 2018 was bookended by severe weather events in Tennessee with severe storm damage reported on the 1st and 31st.

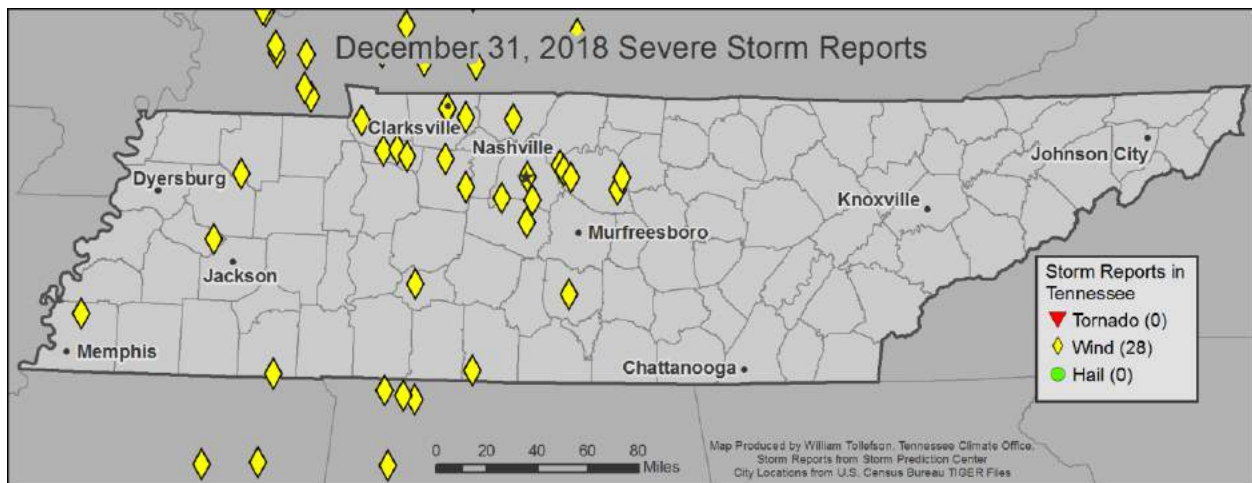


Hail reports:

Time (UTC)	Size	Location	County	Lat	Lon	Comments
19:55	1"	BLUE GOOSE	HENDERSON	35.7	-88.58	QUARTER SIZED HAIL IN BLUE GOOSE. (MEG)

Wind Reports:

Time (UTC)	Speed	Location	County	Lat	Lon	Comments
5:45	--	8 NNE PIKEVILLE	BLED SOE	35.71	-85.14	SEVERAL TREES DOWN ACROSS BIG SPRINGS GAP RD. (MRX)
5:50	--	5 NW DUNLAP	SEQUATCHIE	35.42	-85.45	TREES DOWN ALONG STATE ROUTE 8 ON CAGLE MOUNTAIN. (MRX)



Wind Reports:

Time (UTC)	Speed	Location	County	Lat	Lon	Comments
16:35	--	MILLINGTON	SHELBY	35.33	-89.89	TREE LIMB DOWN ON POWER LINE. TIME ESTIMATED FROM RADAR. (MEG)
16:38	--	GREENFIELD	WEAKLEY	36.16	-88.8	TWO TREES DOWN ON HIGHWAY 54 IN GREENFIELD. TIME ESTIMATED FROM RADAR. (MEG)
17:35	--	GADSDEN	CROCKETT	35.78	-88.98	ROOF OF A STORAGE SHED DAMAGED. TIME ESTIMATED FROM RADAR. (MEG)
18:38	--	GUYS	MCNAIRY	35.02	-88.54	A CARPORT WAS TOSSED ACROSS A YARD. TIME IS RADAR ESTIMATED. (MEG)
18:40	--	6 W DOVER	STEWART	36.48	-87.96	NUMEROUS REPORTS OF TREES DOWN IN THE LAND BETWEEN THE LAKES AREA AND THE WESTERN PART OF STWEART COUNTY. TIME ESTIMATED VIA RADAR. (OHX)
18:56	--	2 WSW TENNESSEE RIDGE	HOUSTON	36.31	-87.8	A FEW TREES DOWN IN THE LARGENT HOLLOW AREA OF HIGHWAY 147. EM ALSO SAID THERE WERE TWO OTHER LOCATIONS ALONG HIGH 147 WITH TREES DOWN. LOCATION UNKNOWN AT THE TIME OF (OHX)
19:04	--	5 ESE ERIN	HOUSTON	36.28	-87.63	REPORT OF A TREE BLOCKING THE ROAD ON BATEMAN BRANCH ROAD. TIME ESTIMATED VIA RADAR. (OHX)
19:04	--	ERIN	HOUSTON	36.32	-87.7	REPORT OF A TREE BLOCKING THE ROAD ON BATEMAN BRANCH ROAD. TIME ESTIMATED VIA RADAR. (OHX)
19:12	--	5 ESE ERIN	HOUSTON	36.28	-87.63	REPORT OF A TREE BLOCKING THE ROAD ON BATEMAN BRANCH ROAD. TIME ESTIMATED VIA RADAR. (OHX)
19:23	--	1 S CLARKSVILLE	MONTGOMERY	36.55	-87.35	DOWNED TREE CAUSED EXTENSIVE ROOF DAMAGE TO A HOUSE ON HICKORY GROVE BOULEVARD IN CLARKSVILLE. (OHX)
19:23	--	CLARKSVILLE	MONTGOMERY	36.56	-87.35	TREE DOWN ON HOUSE ON RIVERSIDE DRIVE IN CLARKSVILLE (OHX)
19:35	--	5 ENE VANLEER	DICKSON	36.27	-87.36	REPORT OF TREE IN THE ROAD IN CUMBERLAND FURNACE. TIME ESTIMATED VIA RADAR. (OHX)
19:36	--	2 SSE RED RIVER ESTATES	MONTGOMERY	36.51	-87.22	HAM OPERATOR REPORTED TREES DOWN AT MACCADO RD. NEAR SANGO. TIME ESTIMATED VIA RADAR. (OHX)
19:45	--	HOHENWALD	LEWIS	35.55	-87.56	EM REPORTED A TREE DOWN ON BUFFALO ROAD. TIME ESTIMATED FROM RADAR. (OHX)
19:45	--	WHITE BLUFF	DICKSON	36.11	-87.21	REPORT OF TREE IN THE ROAD ON WHITE BLUFF AND CUMBERLAND FURANCE. TIME ESTIMATED VIA RADAR. (OHX)

19:54	--	WHITE BLUFF	DICKSON	36.11	-87.21	REPORT OF TREE IN THE ROAD IN WHITE BLUFF. TIME ESTIMATED VIA RADAR. (OHX)
20:04	--	SPRINGFIELD	ROBERTSON	36.5	-86.88	REPORT OF A TREE DOWN ON A HOUSE BESSIE STREET. TIME ESTIMATED VIA RADAR. (OHX)
20:13	--	2 SW BELLEVUE	DAVIDSON	36.05	-86.96	TWO TREES DOWN ON POWER LINES AT POPLAR CREEK ROAD AND GRIFFITH ROAD IN DAVIDSON COUNTY (OHX)
20:38	--	NASHVILLE	DAVIDSON	36.17	-86.78	A SPOTTER REPORTED A TREE DOWN ON MARRIOT ROAD. (OHX)
20:39	--	4 ESE FRANKLIN	WILLIAMSON	35.91	-86.78	TREE DOWN AND BLOCKING ROAD NEAR CLOVERCROFT ROAD AND HWY 96 (OHX)
20:40	--	2 SSE CRIEVE HALL	DAVIDSON	36.04	-86.74	PICTURE OF A FENCE PIECE DOWN. MOST LIKELY FROM A TREE FALLING ON IT. (OHX)
20:45	--	2 NNE MINOR HILL	GILES	35.06	-87.15	TREE DOWN ON HIGHWAY 11 JUST NORTH OF MINOR HILL. TIME ESTIMATED VIA RADAR. (OHX)
20:48	--	1 E LANGFORD COVE	WILSON	36.24	-86.55	TREE DOWN AT N. GREENHILL ROAD AND VANDERBILT ROAD. TIME ESTIMATED VIA RADAR. (OHX)
20:50	--	MOUNT JULIET	WILSON	36.21	-86.52	TREE LIMBS DOWN ON GOLDEN BEAR PARKWAY. (OHX)
20:56	--	1 E BELINDA CITY	WILSON	36.17	-86.47	TREE DOWN AT BELINDA PARKWAY AND ADELMONT COURT. TIME ESTIMATED VIA RADAR. (OHX)
21:29	--	2 WNW SHELBYVILLE	BEDFORD	35.5	-86.48	PHOTO OF DOWNED TREE ON HWY 41A. TIME ESTIMATED VIA RADAR. (OHX)
21:36	--	WATERTOWN	WILSON	36.1	-86.14	TREE DOWN ON SHERRILLTOWN ROAD. TIME ESTIMATED FROM RADAR. (OHX)
22:33	--	4 ESE TUCKERS CROSSROAD	WILSON	36.17	-86.11	TREE IN ROAD AT SOUTH COMMERCE ROAD AT BLUEBIRD ROAD (OHX)

CPC outlooks for the next month:

There is no strong climate forcing signal for temperatures for the month of January, so Tennessee, along with most of the eastern and southern sections of the country, has equal chances for observing temperatures that are normal, above normal, or below normal.

There is a moderate chance (33-40%) that the state will observe above normal precipitation during January, with the higher confidence in southeast Tennessee.

