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Tennessee Climate Office Monthly Report

2-1-2019

2019 February - Tennessee Monthly Climate Report

Tennessee Climate Office, East Tennessee State University

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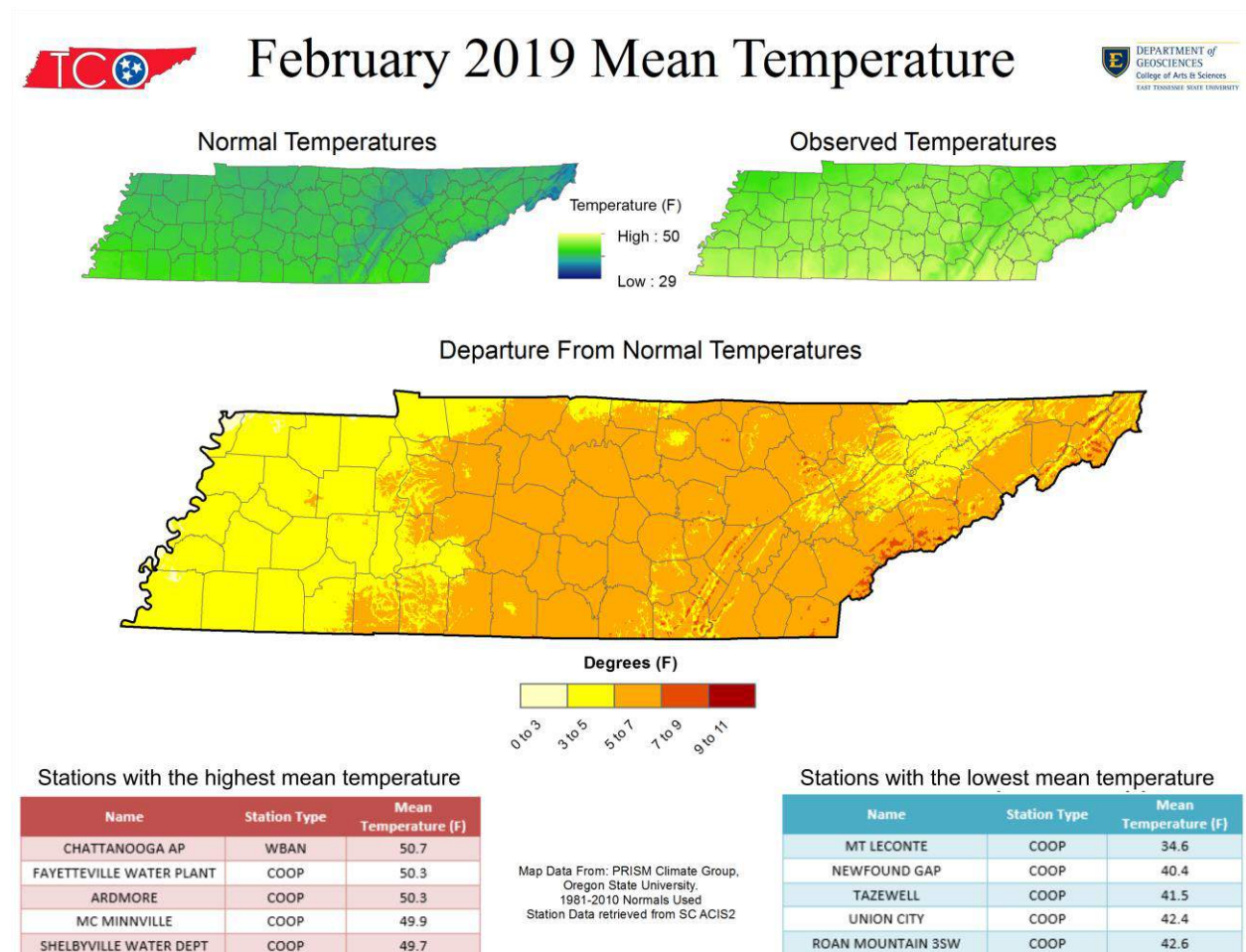
February 2019 Tennessee Climate Summary

Tennessee Climate Office * East Tennessee State University

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

Monthly Temperature Summary:

Temperatures during the month of February were warmer than normal, with mean monthly temperatures 3-7°F above normal in most of the state. The eastern two-thirds of the state recorded temperatures above normal every week during the month, with the western third of the state recording temperatures below normal for the 3rd week of the month (14th-20th). The first half of the month included the highest departures with temperatures in the range of 10°F above normal. This period included record-setting warmth across the state on the 5th, 6th, and 7th, with daily record highs set in Memphis, Jackson, Clarksville, Nashville, Chattanooga, Crossville, Oak Ridge, Knoxville, and the Tri-Cities on one or more of those dates (Chattanooga set daily record highs on all three days, with high temperatures of 74, 70, and 80 degrees).



Monthly Precipitation Summary:

February also brought record-setting precipitation to areas of the state, with recorded precipitation totals ranging from a minimum of 5.59" in Erwin (Unicoi County) to 18.49" in Bells (Crockett County)! There were several rounds of heavy rainfall across different portions of the state throughout the month. Nashville recorded double its monthly average precipitation in just the week from the 7th to the 13th with parts of the city nearing 400% normal precipitation by the end of the month! Another period of heavy precipitation occurred at the end of the month and resulted in widespread flash flooding, river flooding, and landslides across the state. By the end of the month, 157 of 264 reporting rain gauges across the state had recorded more than a foot of rain! This was the wettest February on record for Clarksville, Nashville, Cookeville, Crossville, Knoxville, and the Tri-Cities, the second wettest in Chattanooga, and the third wettest in Jackson. Virtually all precipitation this month was in the form of rainfall, with only one station (Mt. LeConte) reporting measureable snowfall (0.5 inches), with a few other stations reporting trace amounts during the month.



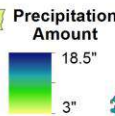
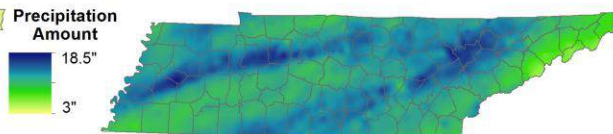
February 2019 Precipitation



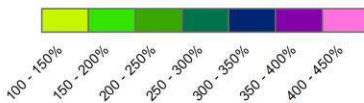
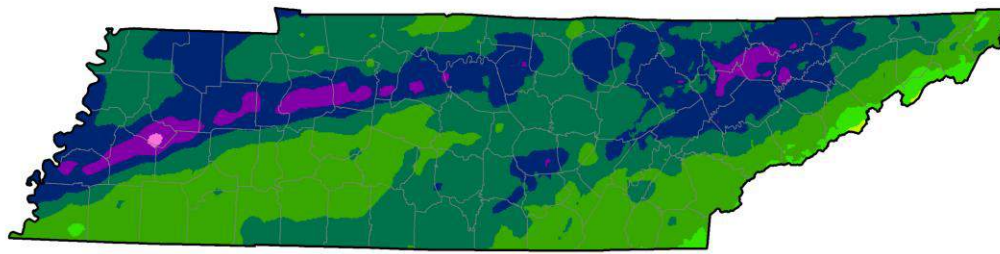
Normal Precipitation



Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Name	Station Type	Total Precipitation (in)
BELLS 2.5 NE	CoCoRaHS	18.49
MONTGOMERY BELL SP	COOP	18.19
BELLE MEADE 1.2 ESE	CoCoRaHS	17.26
MCMINNVILLE 8.5 ESE	CoCoRaHS	17.14
DICKSON 5.8 NW	CoCoRaHS	16.92

Stations with the least precipitation

Name	Station Type	Total Precipitation (in)
ERWIN 1 W	COOP	5.59
ROAN MOUNTAIN 3SW	COOP	6.27
ROAN MOUNTAIN 7.1 W	CoCoRaHS	6.59
MURFREESBORO 3.8 SSE	CoCoRaHS	6.65
GREENEVILLE 10.1 S	CoCoRaHS	7.41

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

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

Hottest Stations (highest max temp):

Name	Station Type	Max Temperature (F)
CHATTANOOGA AP	WBAN	80
SEVIERVILLE	COOP	80
NEWPORT 1 NW	COOP	80
ERWIN 1 W	COOP	80
CLEVELAND FILTER PLANT	COOP	79
ATHENS	COOP	79
KNOXVILLE EXP STA	COOP	79
GREENEVILLE EXP STA	COOP	79
NASHVILLE INTL AP	WBAN	78
ELIZABETHTON	COOP	78
DECATUR 7NE	COOP	78
NASHVILLE BERRY FIELD	COOP	78
SPRING CITY	COOP	78

Tie for 9th place with a maximum high of 78°F

Coldest Stations (lowest min temp):

Name	Station Type	Lowest Temperature (F)
MT LECONTE	COOP	9
PICKETT STATE PARK	COOP	11
ELIZABETHTON	COOP	13
JAMESTOWN	COOP	13
PORTLAND SEWAGE PLANT	COOP	13
GOODLETTSVILLE 7WNW	COOP	13
WHITE HOUSE	COOP	13
TAZEWELL	COOP	14
ONEIDA	COOP	14
SPRINGFIELD EXP STATION	COOP	14
COALMONT	COOP	14
TENNESSEE RIDGE	COOP	14
MANCHESTER #2	COOP	14

Tie for 8th place with a minimum low of 14 °F

Warmest Stations (highest mean temps):

Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	50.7
FAYETTEVILLE WATER PLANT	COOP	50.3
ARDMORE	COOP	50.3
MC MINNVILLE	COOP	49.9
SHELBYVILLE WATER DEPT	COOP	49.7
TULLAHOMA	COOP	49.1
NASHVILLE INTL AP	WBAN	48.9
MEMPHIS INTL AP	WBAN	48.8
PIKEVILLE	COOP	48.8
NEWPORT 1 NW	COOP	48.8

Coollest Stations (lowest mean temps):

Name	Station Type	Mean Temperature (F)
MT LCONTE	COOP	34.6
NEWFOUND GAP	COOP	40.4
TAZEWELL	COOP	41.5
UNION CITY	COOP	42.4
ROAN MOUNTAIN 3SW	COOP	42.6
CROSSVILLE EXP STN	COOP	43.1
MONTGOMERY BELL SP	COOP	43.1
JAMESTOWN	COOP	43.2
GOODLETTSVILLE 7WNW	COOP	43.2
ONEIDA	COOP	43.3

Wettest Stations (highest rainfall totals):

Name	Station Type	Total Precipitation (in)
BELLS 2.5 NE	CoCoRaHS	18.49
MONTGOMERY BELL SP	COOP	18.19
BELLE MEADE 1.2 ESE	CoCoRaHS	17.26
MCMINNVILLE 8.5 ESE	CoCoRaHS	17.14
DICKSON 5.8 NW	CoCoRaHS	16.92
VANLEER 2.8 SE	CoCoRaHS	16.65
MOUNT JULIET 5.2 SSW	CoCoRaHS	16.58
PIKEVILLE 13.2 NE	CoCoRaHS	16.55
BERRY HILL 1.6 WNW	CoCoRaHS	16.37
FARRAGUT 1.0 WNW	CoCoRaHS	16.14

Driest Stations (lowest rainfall totals):

Name	Station Type	Total Precipitation (in)
ERWIN 1 W	COOP	5.59
ROAN MOUNTAIN 3SW	COOP	6.27
ROAN MOUNTAIN 7.1 W	CoCoRaHS	6.59
MURFREESBORO 3.8 SSE	CoCoRaHS	6.65
GREENEVILLE 10.1 S	CoCoRaHS	7.41
GERMANTOWN 4SE	COOP	7.51
AMES PLANTATION	COOP	7.65
GATLINBURG 2 SW	COOP	7.68
HENRY 4.5 N	CoCoRaHS	7.86
GREENEVILLE EXP STA	COOP	8.21

Snowiest Stations (total monthly snowfall):

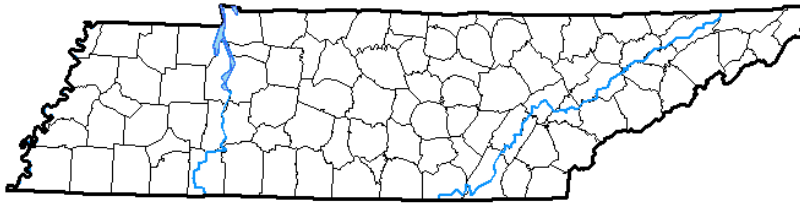
Name	Station Type	Total Snowfall (in)
MT LECONTE	COOP	0.5
CHATTANOOGA AP	WBAN	T
JACKSON MCKELLAR-SIPES AP	WBAN	T
NASHVILLE INTL AP	WBAN	T
KNOXVILLE AP	WBAN	T
BRISTOL AP	WBAN	T
PIKEVILLE	COOP	T
MORRISTOWN WFO	COOP	T
THOMPSON STATION	COOP	T
SPRING HILL 2.2 N	CoCoRaHS	T

Drought Monitor:

Tennessee continued to be drought free during the month of February.

U.S. Drought Monitor Tennessee

February 26, 2019
(Released Thursday, Feb. 28, 2019)
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/>



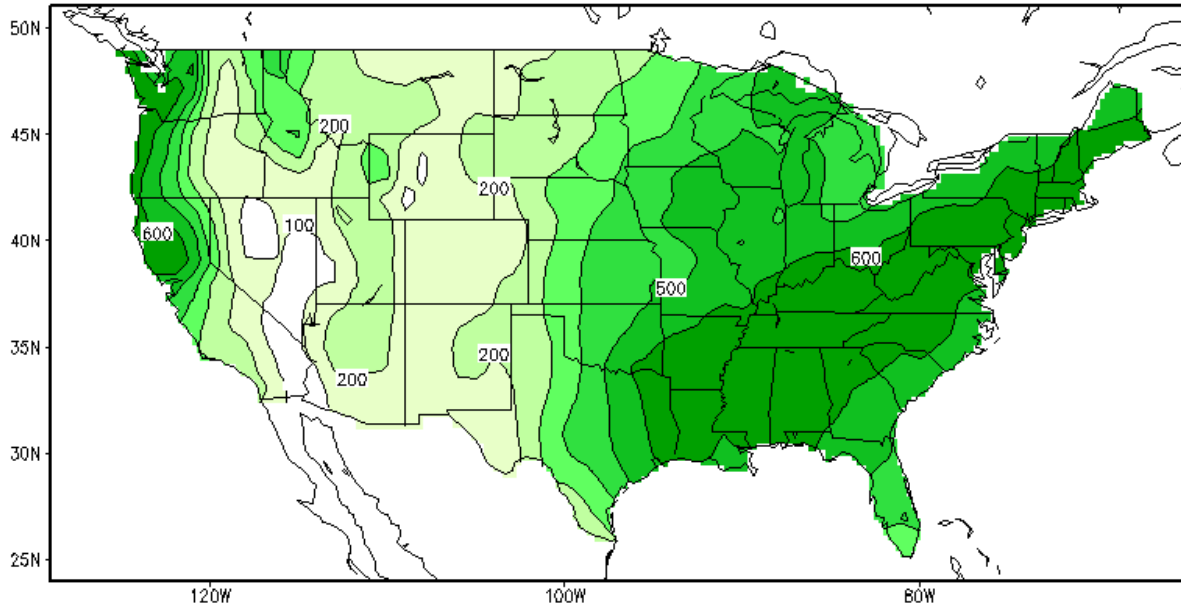
Author:

Brad Rippey
U.S. Department of Agriculture

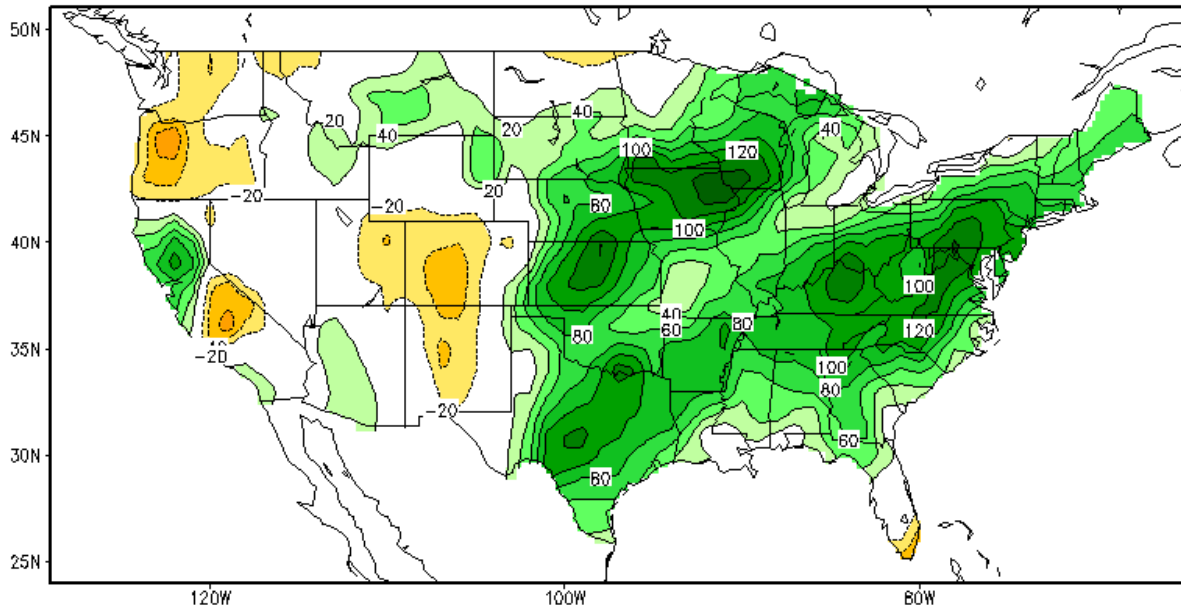
Soil Moisture:

Calculated soil moisture was in excess of 600mm across the state, which was above normal for the whole state. The soil moisture anomaly for the month ranged from a surplus of 60mm in the southwest corner of the state (in the area around Shelby County) to 100mm in the eastern third of the state. All areas observed an increasing trend in soil moisture observations during the month.

Calculated Soil Moisture (mm)
FEB, 2019

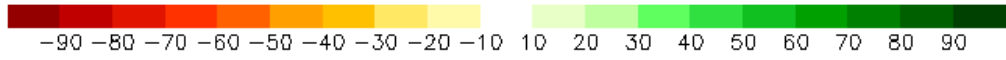
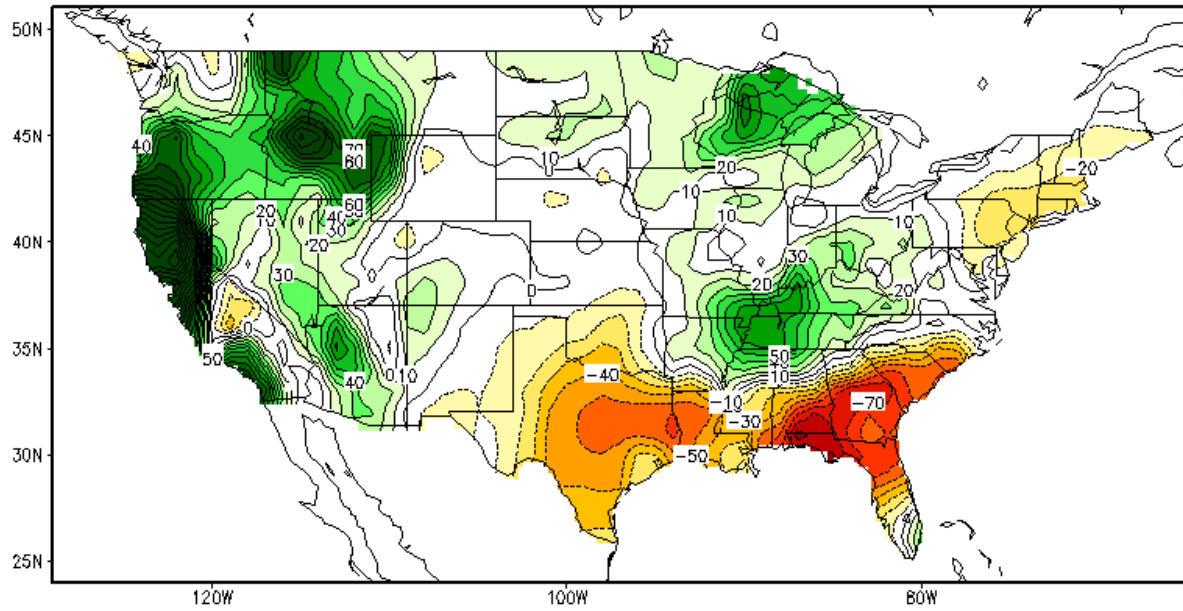


100 200 300 400 500 600
Calculated Soil Moisture Anomaly (mm)
FEB, 2019



-160 -140 -120 -100 -80 -60 -40 -20 20 40 60 80 100 120 140 160

Calculated Soil Moisture Anomaly Change
FEB 28, 2019 from JAN.31



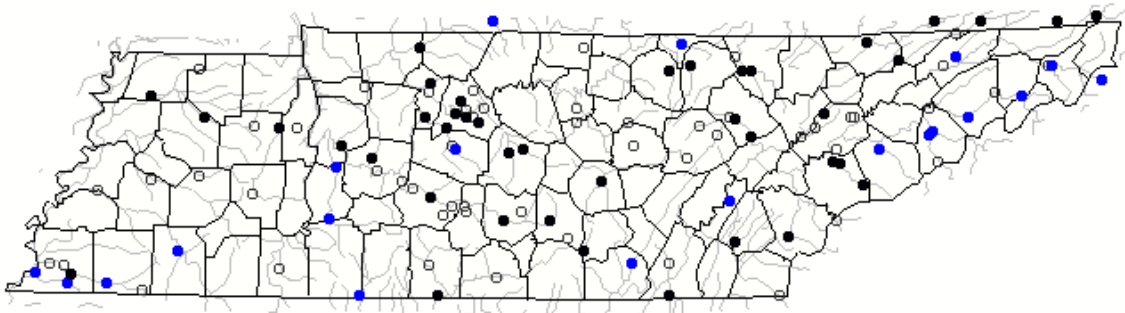
Streamflow:

Associated with the extreme precipitation recorded during the month, stream flows were much above normal across the state for February. Minor to moderate river flood stages were observed along the Mississippi, Tennessee, Cumberland, and other smaller rivers in the state. By Friday, March 1st the crest of the flood waters had cleared the eastern half of the state, with rivers still above flood stage found only in the western half of the state, although flows were still high in the eastern half. The Mississippi River at Memphis reached moderate flood stage (40ft) on the 28th, and is forecast to crest during the first week of March at 41.5ft. The Tennessee River at Perryville reached major flood stage, and was only 2ft short of its record stage!

Map of 28-day average streamflow compared to historical streamflow for the day of the year (Tennessee)

Tennessee ▼ or Water-Resources Regions ▼

Thursday, February 28, 2019



Search USGS streamgage 🔍

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

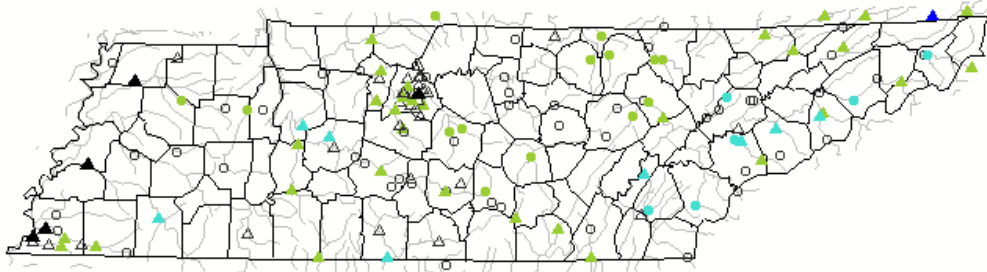
List of all stations Single station Nearest stations

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

Map of flood and high flow condition (Tennessee)

Tennessee or Water-Resources Regions

Friday, March 01, 2019 15:30ET

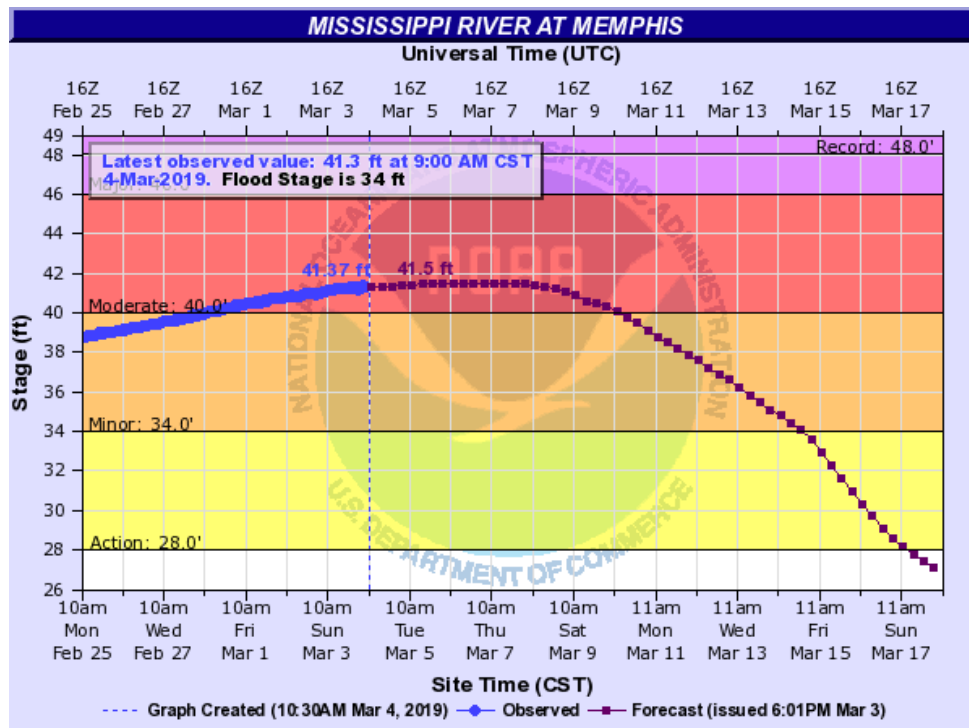


Search USGS streamgage

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

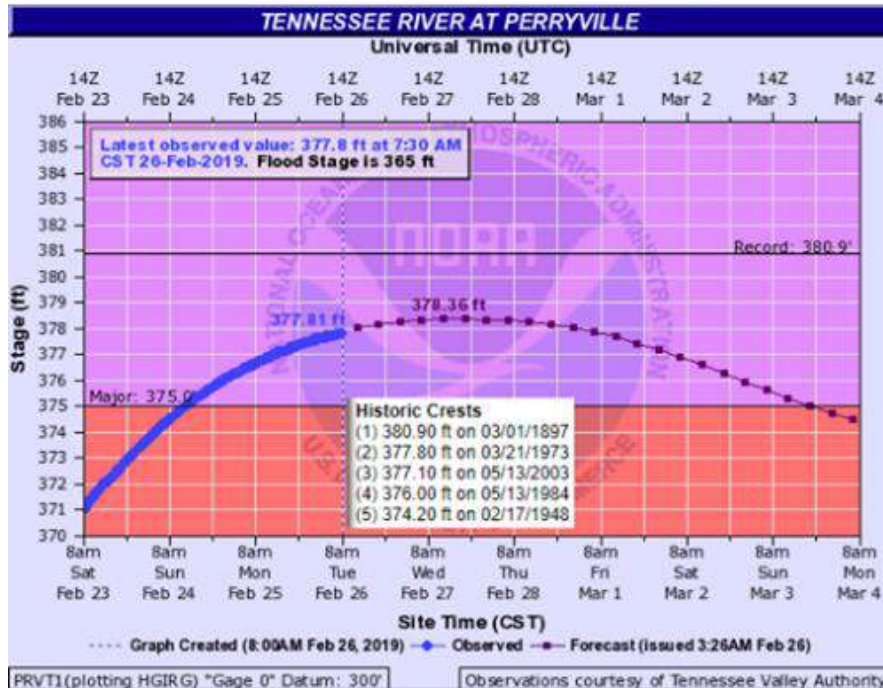
- List of all stations
- Single station
- Nearest stations
- Peak flow

Explanation - Percentile classes				
<95	95-98	>= 99	River above flood stage	Not ranked
△ Streamgage with flood stage			○ Streamgage without flood stage	



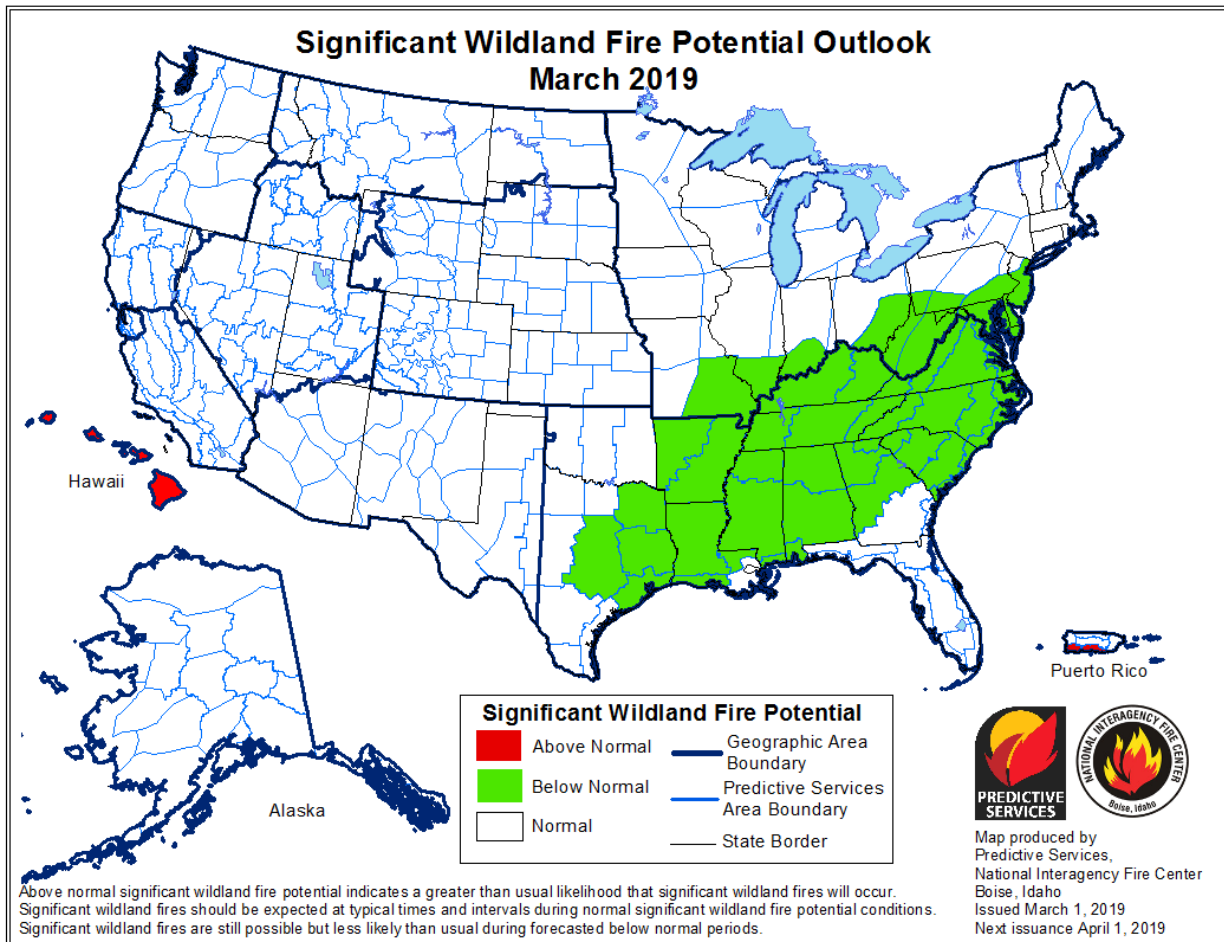


The Tennessee River at Perryville just eclipsed the #2 spot on all-time historic crests. It is expected to crest tomorrow at 378.4 feet, just 2 feet below the all-time record set back in 1897. #History #Flooding #tnwx



Miscellaneous:

Fire Danger: With the extreme rainfall of February and an outlook for above normal precipitation in March, the fire danger is forecast to be below normal for the next month.



Snowfall: Tennessee experienced a major snowfall drought during the month of February, with only one station (Mount LeConte) reporting measureable snowfall during the month. A few other weather stations reported trace amounts (see Top Tenn Snow table).

Story of the month:

Record-setting precipitation, along with flooding and associated landslides and rock falls, was the major story of February 2019, with a secondary focus on record-breaking warmth as well.

Periods of heavy precipitation occurred throughout the month, saturating soils and filling rivers and reservoirs, these rainfall events culminated in the last week of the month, specifically the period from the 21st to the 24th, resulting in widespread flash flooding, river flooding, and landslides across the state. By the end of the month, 157 of 264 reporting rain gauges across the state had recorded more than a foot of rain! This was the wettest February on record for Clarksville, Nashville, Cookeville, Crossville, Knoxville, and the Tri-Cities, the second wettest in Chattanooga, and the third wettest in Jackson.

The Tennessee Emergency Management Agency (TEMA) activated the Tennessee Emergency Management Plan on February 23rd, which triggered a Level 3 State of Emergency across Tennessee in response to heavy rains and severe weather which occurred from the 21st to the 23rd.

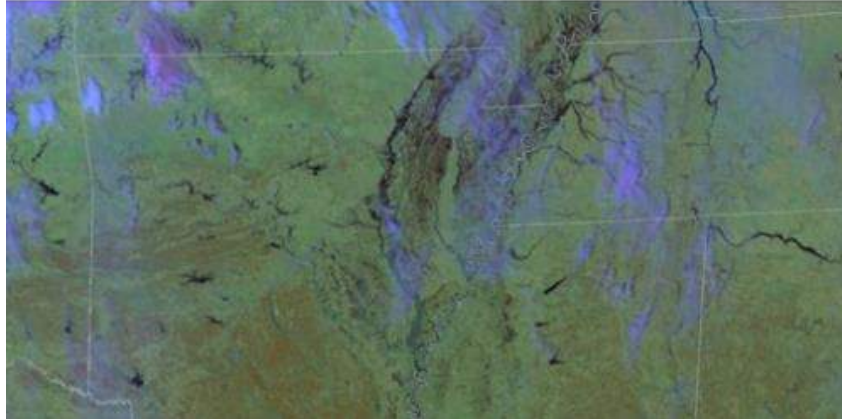
Many rivers in the state including the Mississippi, Tennessee, Cumberland, Obion, Buffalo, and Hatchie reached flood stage during the final week of the month. In addition to river flooding, flash flooding occurred in and around many small rivers and creeks during the heavy rain events.



US National Weather Service Memphis Tennessee added 2 new photos.

20 hrs · 🌐

GOES multi-channel imagery shows the swollen rivers from the recent heavy rainfall along and north of I-40. The rainfall map shows departure from normal for the last 14 days. <https://water.weather.gov/precip/index.php...>



Feb 13th Satellite imagery showing swollen rivers in western Tennessee, and eastern Arkansas



Tennessee River near Clifton, TN. Photo via WSMV.



US National Weather Service Memphis Tennessee

11 hrs · 🌐

Rivers continue to rise into flood stage! Some parts of the Mississippi River are in major flood stage. Go to the link below to take a look at the current stages of the Mississippi. Turn Around Don't Drown.

<https://www.weather.gov/images/.../graphic/mainriverstages.png>

Flood Warnings Update Weather Forecast Office
Memphis, TN
Issued Feb 20, 2019 8:59 PM CST

River flood warnings and Flash Flood Watch

The Mississippi River, parts of the Tennessee River and surrounding areas are in flood stage due to heavy rainfall.

Flash Flood watch is in effect until Saturday evening.

Watch for flooding on roadways, and turn around don't drown.

Hazards

- Flash Flood Watch
- Flood Warning

📍 NWSMemphis #tnwx #arwx #mowx #mswx weather.gov/memphis

Flood warnings posted for rivers in Western Tennessee February 20th



Floodwaters swamp a car and fire truck on Knox Road in Fountain City, TN. Photo via WJHL.

Landslides and other mass wasting events closed roads across the state, including I-40 between Knoxville and Asheville in North Carolina, I-24 near Nashville, and Hwy 70 in Hawkins County. Some other roads were washed out during flooding events as well, including Reynoldsburg Road in Henry County.



Rockslide that shut down I-40 just past the Tennessee-North Carolina State line. Photo via Citizen Times.



Landslide that shut down I-24 in the Nashville Area. Photo via The Tennessean.



WCYB

1 hr · 🌐



A mudslide has closed Highway 70N, according to Mark Nagi with TDOT in Hawkins County. Two vehicles were involved and one person has been taken to the hospital. (Photo credits: Mark Nagi/TDOT)



Damage to Hwy 70 in Hawkins County, due to a mudslide which occurred Feb 21st and proved fatal. Photo via Mark Naigi (TDOT).

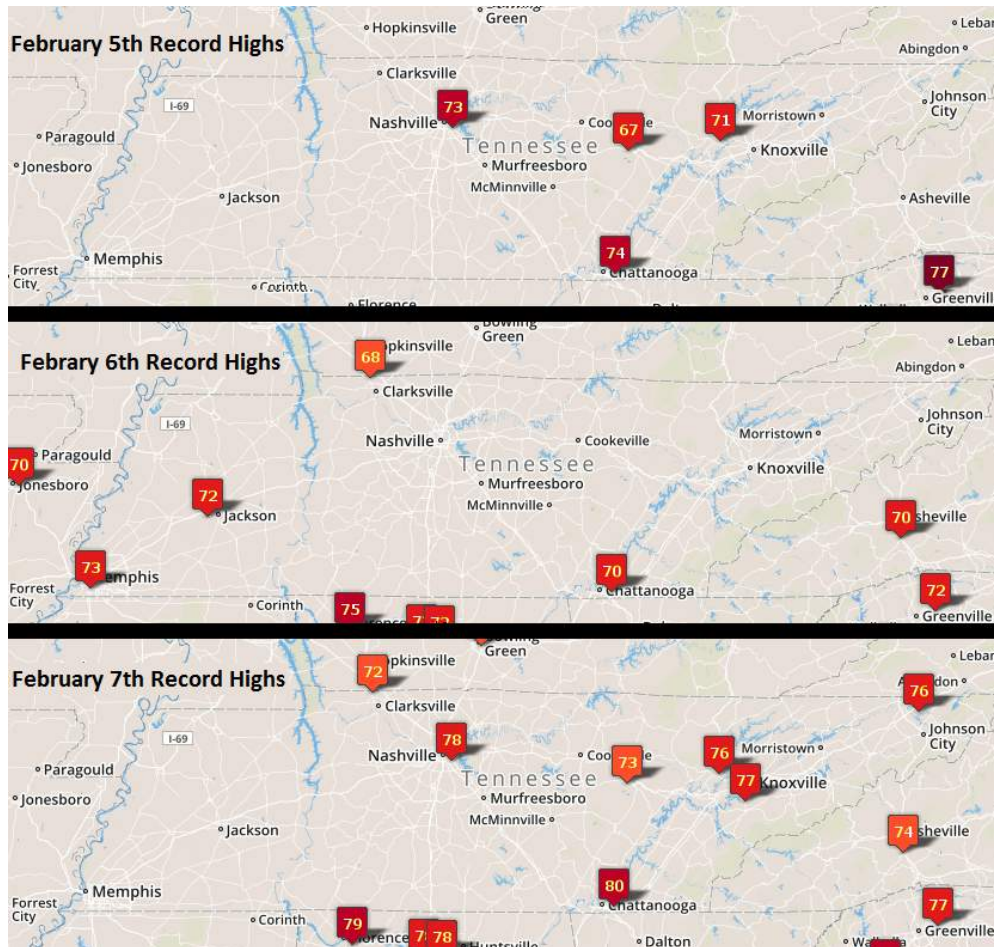


View of Hawkins County Mudslide from WCYB Drone.



Reynoldsburg Road washed out and impassable near Paris, TN (Henry County). Photo via Ron Park, The Paris Post Intelligencer.

A secondary story besides the extreme rainfall was the record warmth of early February. The figure below shows the record high temperatures recorded from the 5th -7th.



Record high temperatures recorded February 5th-7th



US National Weather Service Nashville Tennessee

6 February at 07:15

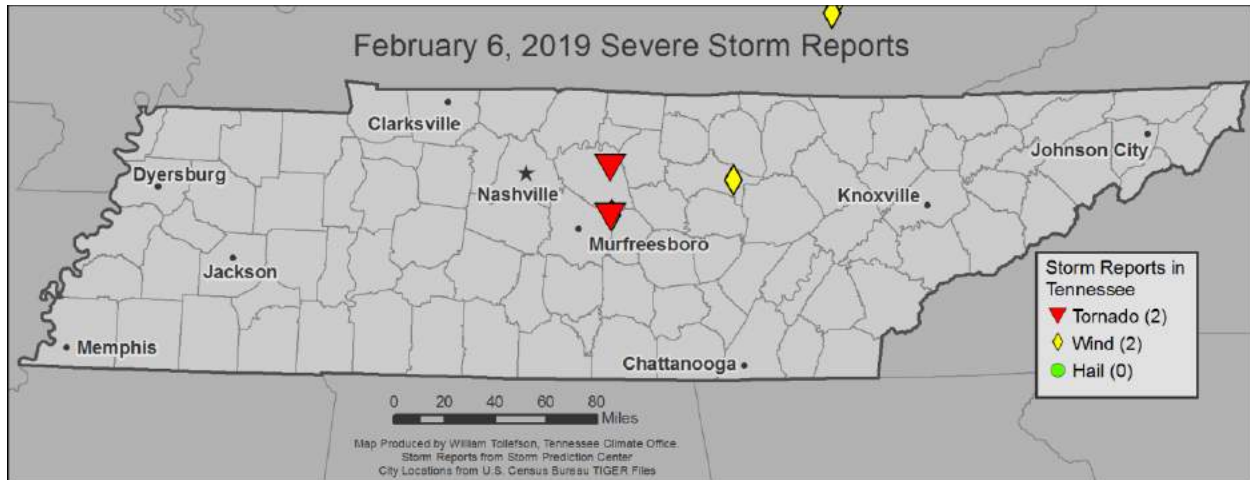
The morning low at Nashville was 66°. The record "warm low" for this date is 57° (1884). The 6 a.m. temperature is 67°, so we are already just 5° away from breaking today's record high. The normal high temperature for February 6 is 50°.

NWS Nashville Facebook post about record temperatures on February 6th

Storm Reports:

There were two days with severe storm reports, the 6th and 23rd, with a total of 2 tornadoes and 4 severe wind reports. Outside of thunderstorms there were also high wind reports in Greene County on the 20th associated with a mountain wave event, with a wind gust of 81mph reported in Camp Creek.

February 6, 2019:



Tornado Reports:

Time (UTC)	Strength	Location	County	Lat	Lon	Comments
20:35	EF0	6 WSW AUBURNTOWN	RUTHERFORD	35.92	-86.19	AN EF-0 TORNADO TOUCHED DOWN ALONG WEST TRIMBLE RD JUST SOUTH OF MILTON AND MOVED NORTHEAST ACROSS HALLS HILL PIKE BEFORE LIFTING SOUTH OF HWY 96. ONE LARGE BARN WEST O (OHX)
3:49	EF0	1 W TUCKERS CROSSROADS	WILSON	36.2	-86.19	A BRIEF... WEAK EF-0 TORNADO TOUCHED DOWN ALONG TROUSDALE FERRY PIKE JUST WEST OF TUCKERS CROSSROADS AND CURVED NORTHEAST BEFORE LIFTING NEAR BIG SPRINGS ROAD. ONE BARN (OHX)

Severe Wind Reports:

Time (UTC)	Speed	Location	County	Lat	Lon	Comments
20:36	--	5 WSW AUBURNTOWN	RUTHERFORD	35.93	-86.18	CARPORT ON FRONT OF HOME DESTROYED. ROOF DAMAGE TO DOUBLE-WIDE HOME. SCATTERED TREE DAMAGE/MINOR DEBRIS NEAR W TRIMBLE RD AND HALLS HILL PIKE. (OHX)
1:00	--	4 W MONTEREY	PUTNAM	36.13	-85.32	TREE DOWN ON MONTEREY HWY. (OHX)



US National Weather Service Nashville Tennessee



21 hrs · 🌐

Our storm survey team also determined another brief, weak EF-0 tornado touched down near Tuckers Crossroads in eastern Wilson County last night. One barn was destroyed with debris blown up to 1/2 mile away, and several trees were blown down. Read more info at: <https://forecast-v3.weather.gov/products/locations/OHX/PNS/1>



US National Weather Service Nashville Tennessee

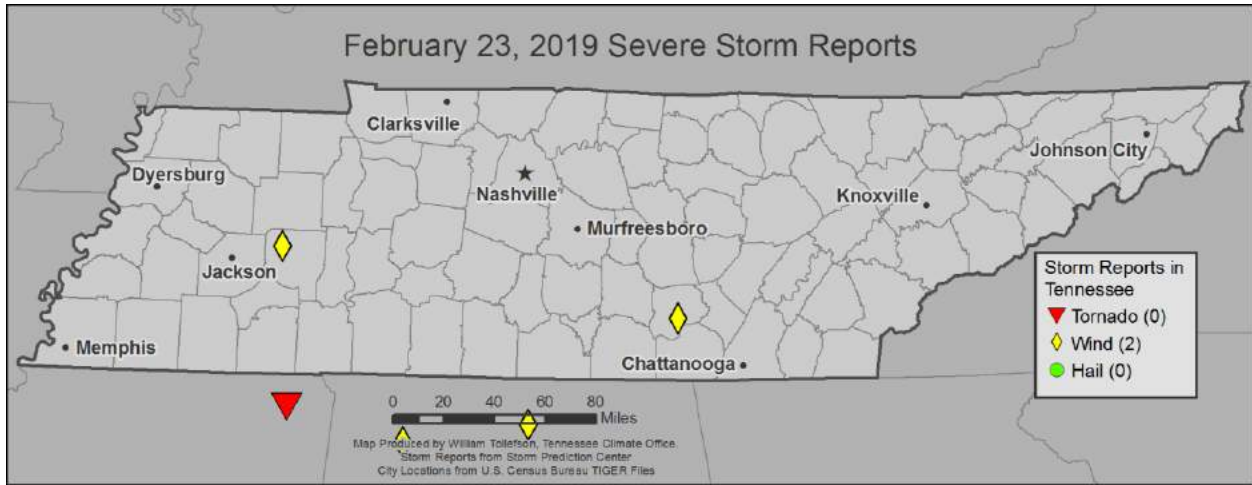


22 hrs · 🌐

Our storm survey team determined an EF-0 tornado with max winds around 80 mph touched down yesterday just south of Milton in Rutherford County. The tornado was on the ground for 1.2 miles and was 75 yards wide. Read more info at <https://forecast-v3.weather.gov/products/locations/OHX/PNS/1>



February 23, 2019:



Time (UTC)	Speed	Location	County	Lat	Lon	Comments
6:15	--	1 E BARGERTON	HENDERSON	35.73	-88.49	SPOTTER REPORTED TWO LARGE TREES DOWN NEAR BARGERTON SCHOOL EVENT. (MEG)
6:39	--	COALMONT	GRUNDY	35.34	-85.71	TREES DOWN ON COLONY ROAD WITH POWER OUTAGES (OHX)

CPC Outlooks for Next Month:

Climate prediction center outlooks for March indicate that the central section of the country will observe below normal temperatures, with the western half of Tennessee included in the area that has a slight chance of observing below normal temperatures. The eastern half of the state will have equal chances of observing temperatures near normal or above/below normal. The Southeast will probably continue the wet pattern from February, with the highest confidence for the eastern and southern portions of Tennessee to observe wetter than normal conditions into March.

