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1-1-2024

2024 January - Tennessee Monthly Climate Report

Tennessee Climate Office, East Tennessee State University

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January 2024 Tennessee State Climate Summary

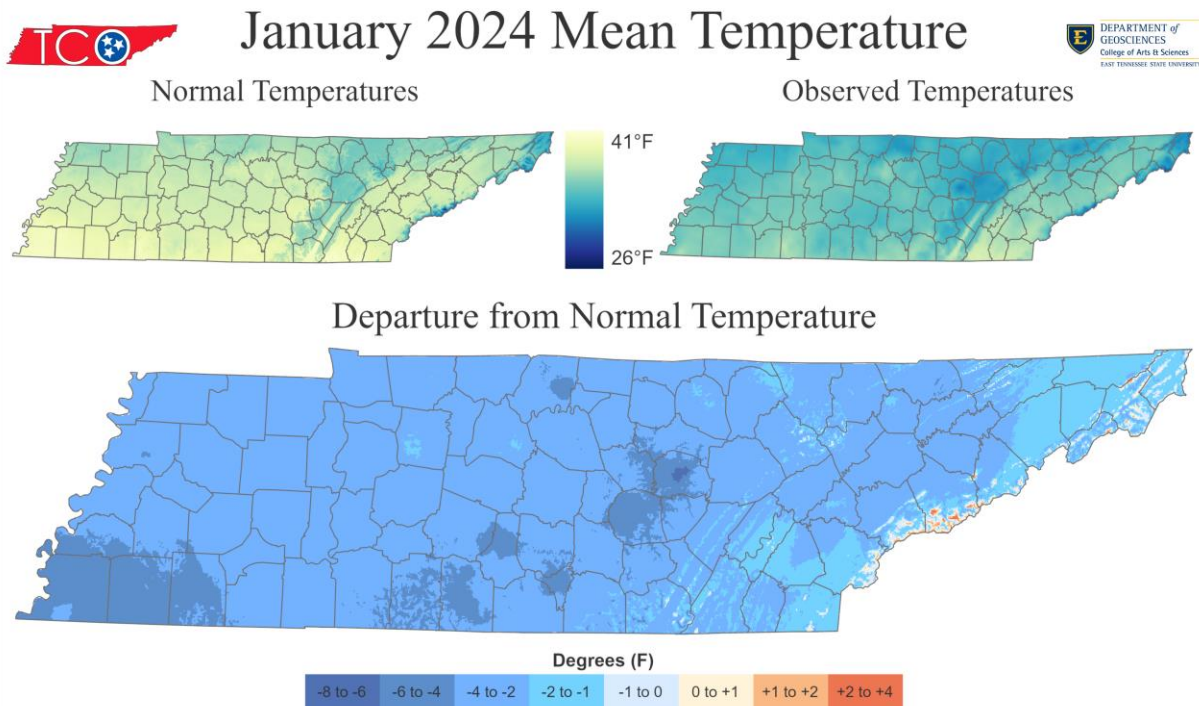
Tennessee Climate Office * East Tennessee State University

Prepared by William Tollefson and Dr. Andrew Joyner

With contributions by [Climate Data Representatives](#) across the state

Monthly Temperature Summary:

January started 2024 out on a cold note for almost the entire state, with the average temperature of the month running 1-4°F above the 1991-2020 climate normals for most areas, and even colder in a few spots in West and Middle Tennessee. However, these cooler than normal conditions were not spread evenly through the month, with the first week of January averaging 0-4°F below normal for most areas of the state, before a warmer than normal week for the second week of the month. An arctic air outbreak occurred in the third week of the month, bringing sub-zero temperatures to many parts of the state and average temperatures more than 20°F colder than normal across the western two thirds of the state. East Tennessee had slightly less severe cold, with temperatures averaging 12-18°F colder than normal for the week. The month then ended with warmer than normal temperatures, with most areas averaging 6-9°F warmer than normal. There was one daily high temperature record set this month, along with 21 broken daily records for warmest low temperatures set across the state. All warm records were set on January 25 or 26. On the cold side of the record books, there were 31 broken daily low temperature records set this month. There were also 50 broken daily records for coolest high temperatures set this month. All cold weather records were set from January 14 to 21.



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	39.1
MEMPHIS INTERNATIONAL AP	WBAN	37.6
NEWPORT 1 NW	COOP	37.2
CLEVELAND FILTER PLANT	COOP	37
FAYETTEVILLE WATER PLANT	COOP	36.7

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	25
NEWFOUND GAP	COOP	28.6
SPARTA WASTEWATER PLANT	COOP	29.6
MOUNTAIN CITY 2	COOP	30.9
TAZEWELL	COOP	31.4

Monthly Precipitation Summary:

Total precipitation for January 2024 was above normal for most areas of the state, with a few areas in the Cumberland Plateau and East Tennessee seeing only 75-99% of their normal January precipitation. Just like with temperatures, this precipitation was not spread evenly through the month, with the first and third weeks of the month averaging out drier than normal while the second and fourth weeks of the month brought above normal precipitation to most areas of the state. The little precipitation that did occur in the third week of the month came as snow for most areas, and most locations recorded more snow this month than for the whole year of 2023.

There were 46 daily precipitation records set this month, and the Kingston Springs and Cheatham Lock and Dam weather stations reported a monthly record for the largest 24-hour precipitation total recorded in the month of January, with 4.5" and 4" of rain, respectively, reported on January 15. In addition to the rainfall records, there were 37 broken daily records set for the highest snowfall recorded on that day - two stations even recorded monthly records for the highest one-day snowfall in the month of January. Beyond the one-day snowfall records, 61 stations across the state reported daily record snow depth measurements. Of those records, it was a monthly record for deepest snow measurement for the month of January, and for two of those it was an all-time record for deepest snow measurement. The two all-time records were set at the Franklin Sewage Plant (Williamson County) with a snow depth of 10.98" on January 17 (this station has a 96-year weather history), and the Morristown Radio WCRK (Hamblen County) with a snow depth of 7.99" on January 16 (this station has a 41-year weather history).

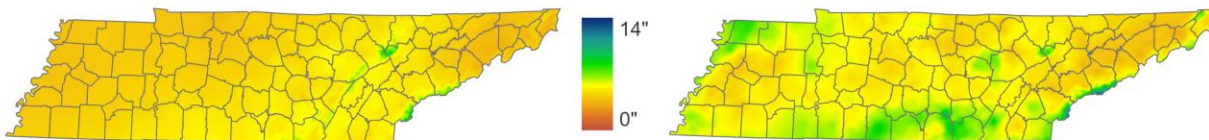


January 2024 Total Precipitation

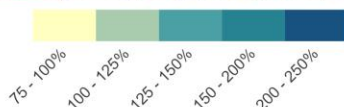
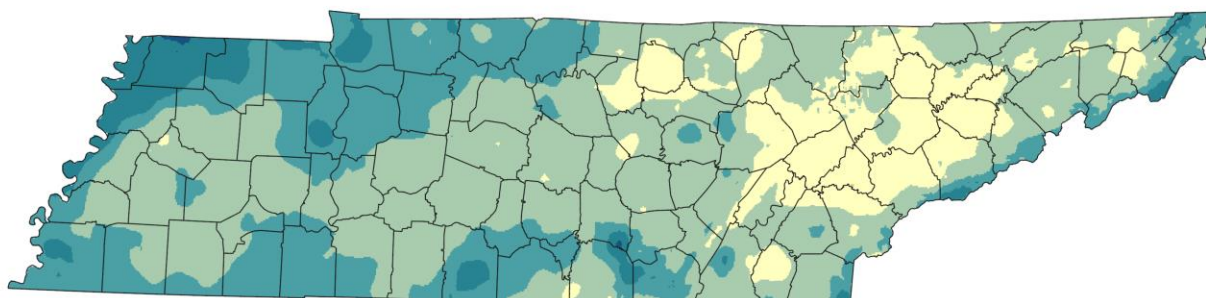


Normal Precipitation

Observed Precipitation



Percent of Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
NEWFOUND GAP	COOP	12.24
WAYNESBORO	COOP	11.41
AMES PLANTATION	COOP	11.31
MT LECONTE	COOP	9.58
DECATUR 7NE	COOP	9.48

Map Data from PRISM Climate Group, Oregon State University.
1991-2020 Climate Normals Used.
Station Data Retrieved From xmACIS2

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
GREENEVILLE 10.1 S	CoCoRaHS	3
JONESBOROUGH 2.5 SSW	CoCoRaHS	3.14
GREENEVILLE 3.0 S	CoCoRaHS	3.15
JONESBOROUGH 2.7 SSW	CoCoRaHS	3.37
ELIZABETHTON	COOP	3.7

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	45.7	29.5	37.6	-4.5	66	1/11	1	1/17	6.63	+2.49	160%
Jackson	44.0	25.4	34.7	-4.3	63	1/25	-10	1/17	5.90	+1.83	145%
Clarksville	42.8	26.8	34.8	-2.2	61	1/25	3	1/17	5.58	+2.30	170%
Nashville	45.0	28.2	36.6	-3.0	65	1/26	-1	1/17	5.40	+1.38	134%
Chattanooga	48.3	30.0	39.1	-2.6	69	1/26	11	1/17	6.47	+1.45	129%
Crossville	40.4	25.0	32.7	-2.6	63	1/25	-7	1/17	5.86	+0.91	118%
Knoxville	45.7	27.0	36.3	-2.8	67	1/26	0	1/17	6.21	+1.45	130%
Bristol	45.8	25.6	35.7	-0.7	70	1/24	3	1/17	3.72	+0.07	102%

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
KINGSTON	COOP	74	27
TELLICO PLAINS	COOP	71	27
BRISTOL AP	WBAN	70	24
KINGSPORT	COOP	69	24
CHATTANOOGA AP	WBAN	69	26
CLEVELAND FILTER PLANT	COOP	68	25
GREENEVILLE EXP STA	COOP	68	26
ELIZABETHTON	COOP	68	25
TOWNSEND 5S	COOP	68	26
EASTVIEW FARM	SCAN	68	25

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
LEWISBURG EXP STA	COOP	-18	17
BETHPAGE 1 S	COOP	-14	18
KINGSTON SPRINGS	COOP	-13	22
GAINESBORO	COOP	-13	17
COALMONT	COOP	-13	18
BLEDSON SF TENNESSEE	RAWS	-13	17
LYNCHBURG	COOP	-12	18
TAZEWELL	COOP	-12	18
CROSSVILLE 7 NW	WBAN	-12	17
MC MINNVILLE	COOP	-11	17
MURFREESBORO 5 N	COOP	-11	17
CROSSVILLE EXP STN	COOP	-11	17
CHRISTIANA 5W	COOP	-11	17

Four stations tied for the 10th coldest temperature (-11°F)

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
CHATTANOOGA AP	WBAN	39.1
MEMPHIS INTERNATIONAL AP	WBAN	37.6
NEWPORT 1 NW	COOP	37.2
CLEVELAND FILTER PLANT	COOP	37
FAYETTEVILLE WATER PLANT	COOP	36.7
NASHVILLE INTL AP	WBAN	36.6
Eastview Farm	SCAN	36.4
PIKEVILLE	COOP	36.3
NASHVILLE BERRY FIELD	COOP	36.3
KNOXVILLE AP	WBAN	36.3

Coollest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	25
NEWFOUND GAP	COOP	28.6
SPARTA WASTEWATER PLANT	COOP	29.6
MOUNTAIN CITY 2	COOP	30.9
TAZEWELL	COOP	31.4
CROSSVILLE 7 NW	WBAN	31.4
BETHPAGE 1 S	COOP	31.6
COALMONT	COOP	31.6
ROAN MOUNTAIN 3SW	COOP	31.6
ONEIDA	COOP	31.7
MAYNARDVILLE	COOP	31.7

Two stations tied for the 10th coolest mean temperature (31.7°F)

Wettest Stations (highest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
NEWFOUND GAP	COOP	12.24
WAYNESBORO	COOP	11.41
AMES PLANTATION	COOP	11.31
MT LECONTE	COOP	9.58
DECATUR 7NE	COOP	9.48
PULASKI WASTEWATER PLANT	COOP	9.45
SEWANEE	COOP	9.22
MONTEAGLE	WBAN	8.95
SAMBURG W. L. REFUGE	COOP	8.71
COALMONT	COOP	8.39

Driest Stations (lowest precipitation totals):

Station Name	Station Type	Total Precipitation (in)
GREENEVILLE 10.1 S	CoCoRaHS	3
JONESBOROUGH 2.5 SSW	CoCoRaHS	3.14
GREENEVILLE 3.0 S	CoCoRaHS	3.15
JONESBOROUGH 2.7 SSW	CoCoRaHS	3.37
ELIZABETHTON	COOP	3.7
BRISTOL AP	WBAN	3.72
ALAMO 0.2 SSW	CoCoRaHS	3.79
BULLS GAP 0.9 SSW	CoCoRaHS	3.82
NEWPORT 1 NW	COOP	3.88
HERMITAGE 4.6 WSW	CoCoRaHS	3.91

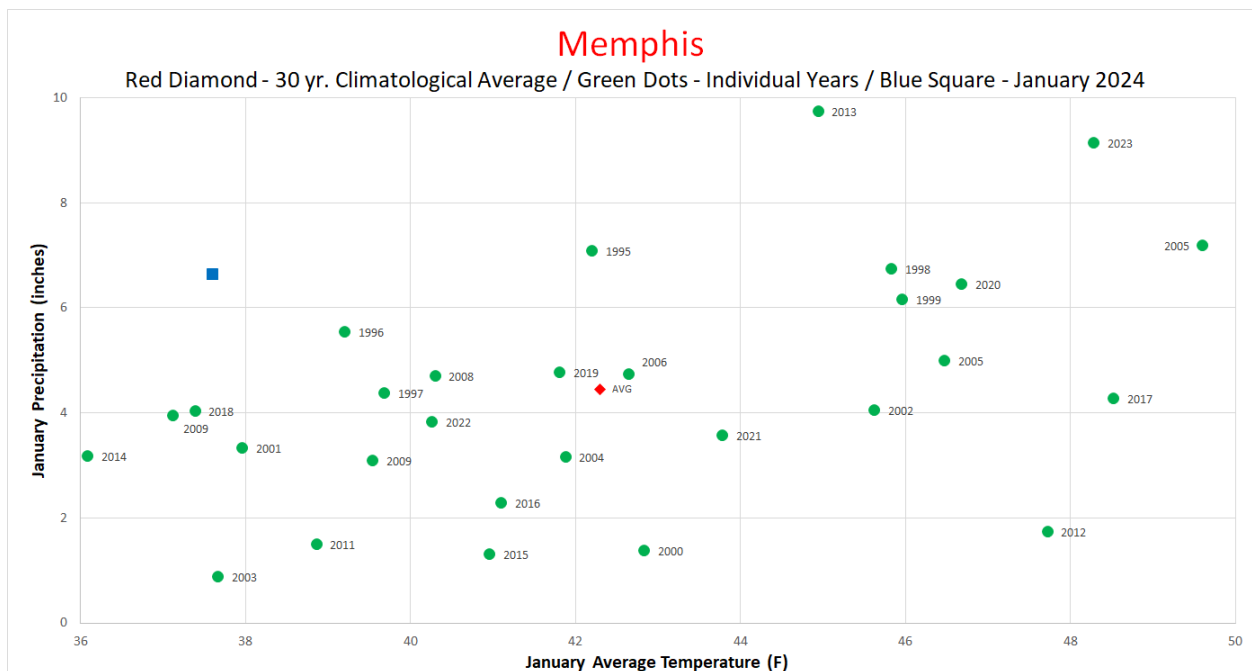
Snowiest Stations (highest snowfall totals):

Station Name	Station Type	Total Snowfall (in)
MT LECONTE	COOP	27.1
NEWFOUND GAP	COOP	23.9
MONTEREY	COOP	12.1
LENOIR CITY	COOP	11.8
ROAN MOUNTAIN 3SW	COOP	11.5
OAK RIDGE 5.7 NE	CoCoRaHS	11
TEN MILE 2.2 NW	CoCoRaHS	10.5
MORRISTOWN WFO	COOP	10.2
KYLES FORD 1.0 N	CoCoRaHS	10
MAYNARDVILLE 0.6 E	CoCoRaHS	9.6
RUTLEDGE 5.3 SE	CoCoRaHS	9.6
MAYNARDVILLE	COOP	9.6

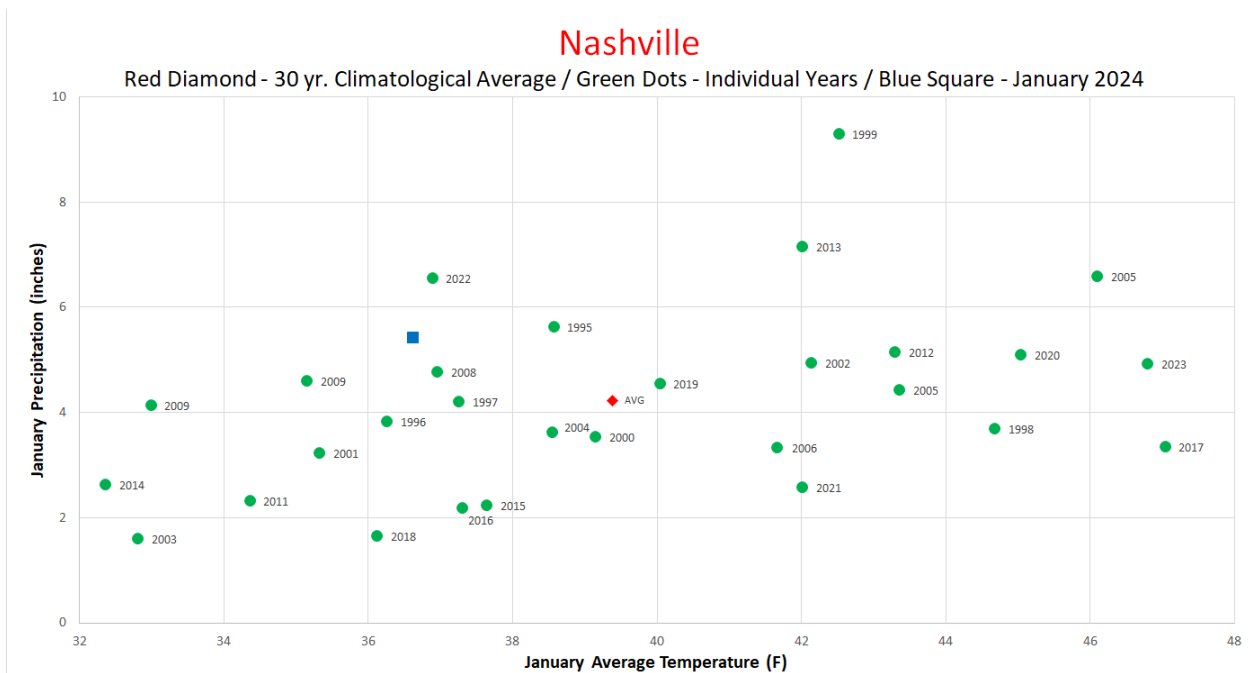
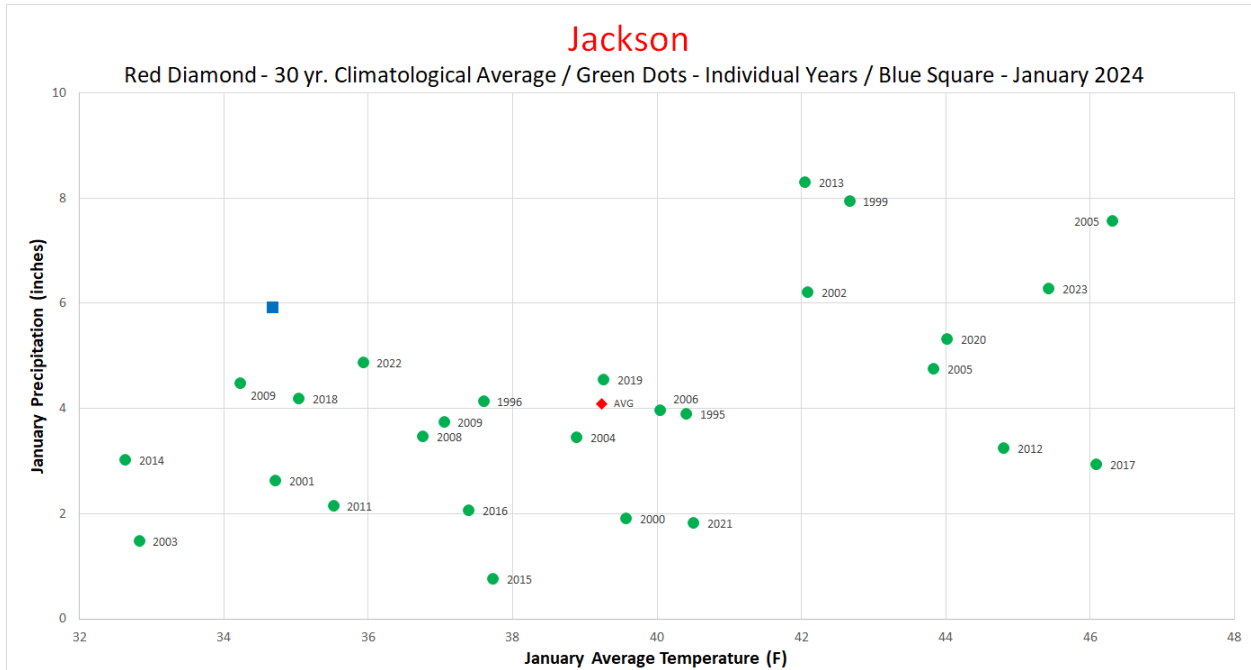
*Three stations tied for the 10th highest snowfall total (9.6")
 A total of 279 weather stations reported measurable snowfall this month,
 with an additional 11 reporting a trace (less than 0.1-inch) of snowfall.*

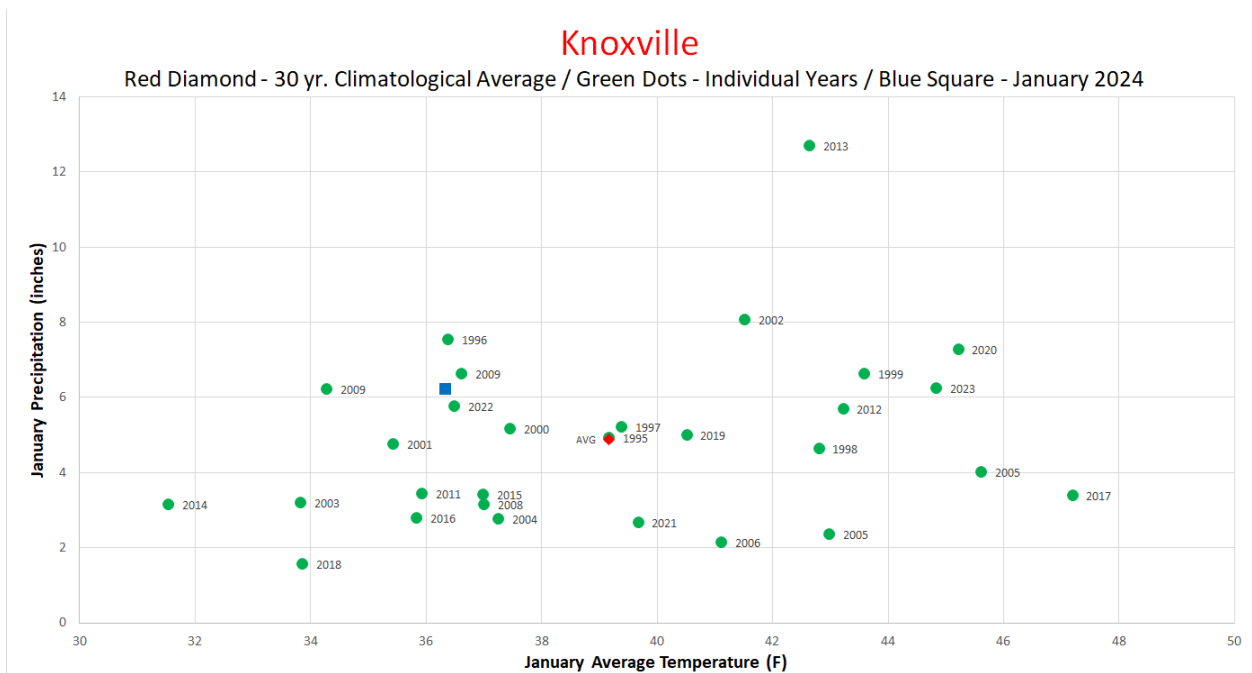
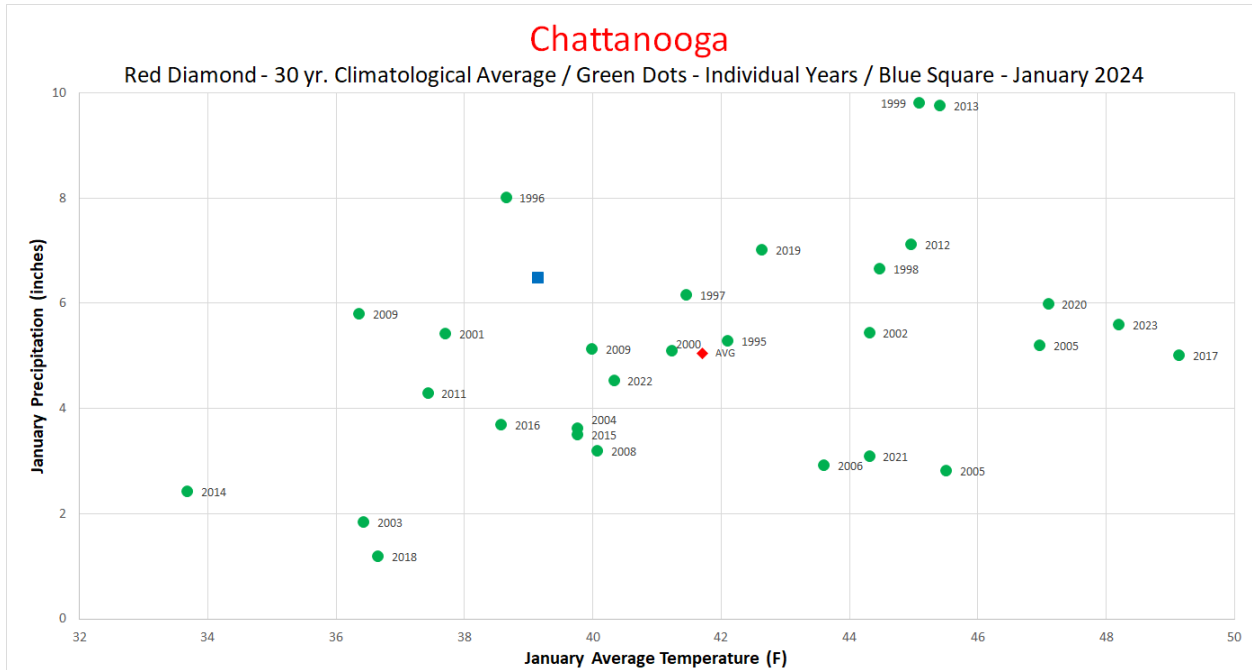
The Month in Comparison:

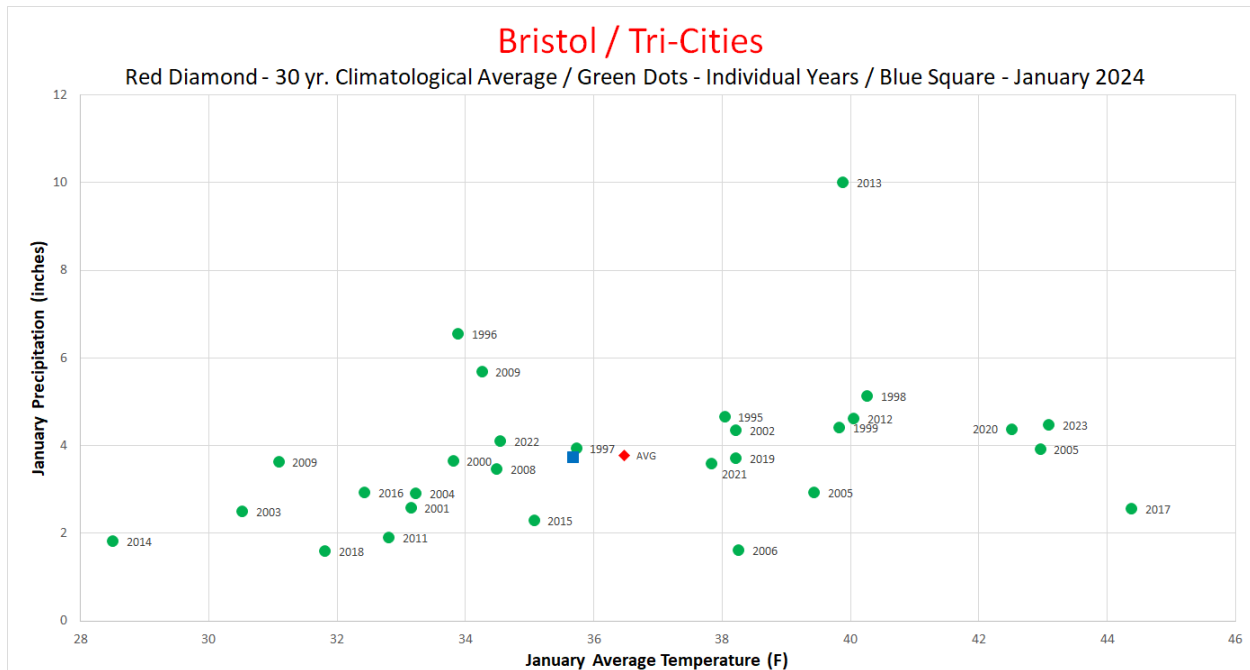
Comparing the total precipitation and average temperature of January 2024 against January of the past thirty years at automated weather stations located at airports across the state, each weather station recorded a cooler than average January and all but Bristol / Tri-Cities recorded a wetter than average January. However, it was not a major outlier, except being the 4th coldest January of the past thirty years for Memphis and Jackson. Looking at the longer-term weather history for each of these cities, 2024 was not in the top ten coolest, or wettest Januaries for any station.



January 2024 Tennessee State Climate Summary

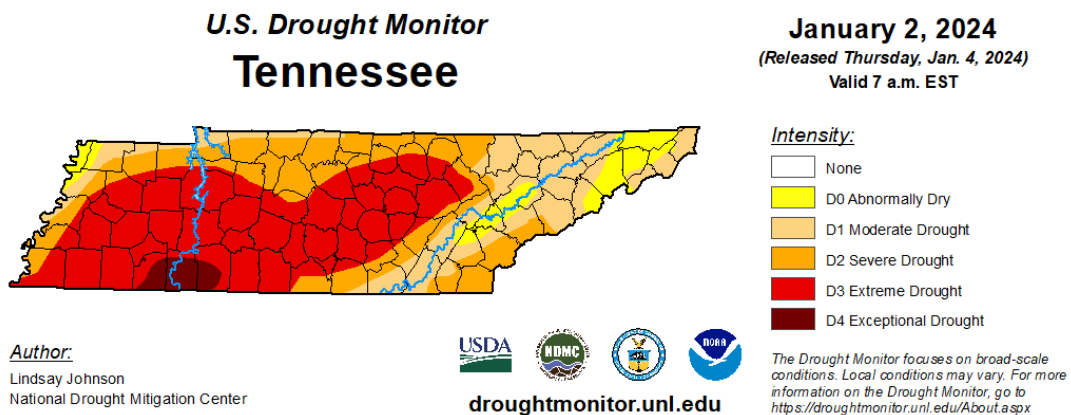






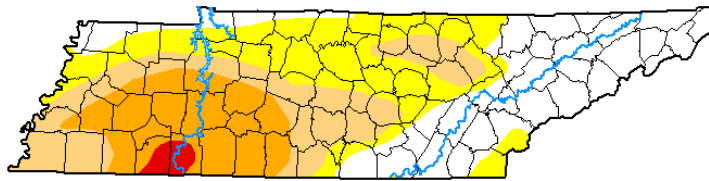
Drought Monitor:

In the last US Drought Monitor for January, Tennessee still had some persistent areas of drought holding over from last fall and the start of winter; however, there were improvements across the state in the range of 1-3 drought monitor categories over the month. In the first US Drought Monitor for 2024, 100% of the state was shown with Abnormally Dry conditions or worse, with 93.07% of the state in some level of Drought (D1-D4). 72.43% of Tennessee was in Severe Drought (D2) or worse, 47.13% of the state was in Extreme or Exceptional Drought (D3 or D4), with 2.57% of the state in Exceptional Drought (D4), the worst category on the US Drought Monitor. Thanks to heavy snowfall and heavy rain events during the month, by the January 30th US Drought Monitor there was no Exceptional Drought (D4) left in the state and only 1.55% of the state’s area was left in Extreme Drought (D3). 18.51% of the state’s area remained in Severe Drought (D2), and 21.39% of the state’s area remained in Moderate Drought (D1). An additional 25.15% of the state’s area was in Abnormally Dry (D0) conditions, while 32.4% of the state was free of any Drought Monitor designation.



U.S. Drought Monitor Tennessee

January 30, 2024
(Released Thursday, Feb. 1, 2024)
Valid 7 a.m. EST



Intensity:

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

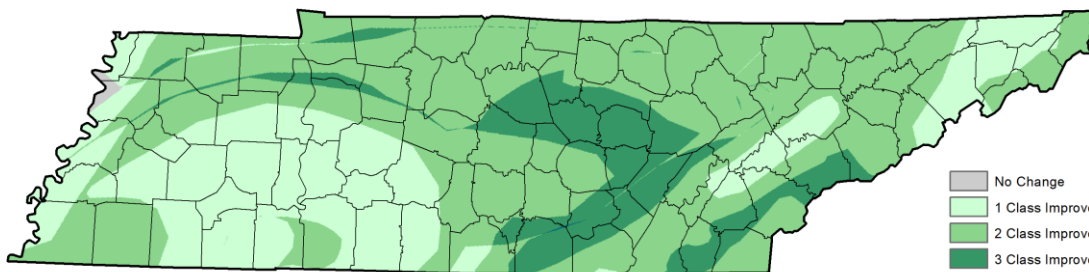
Author:
Brian Fuchs
National Drought Mitigation Center

droughtmonitor.unl.edu

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>

January 30, 2024
compared to
January 2, 2024

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



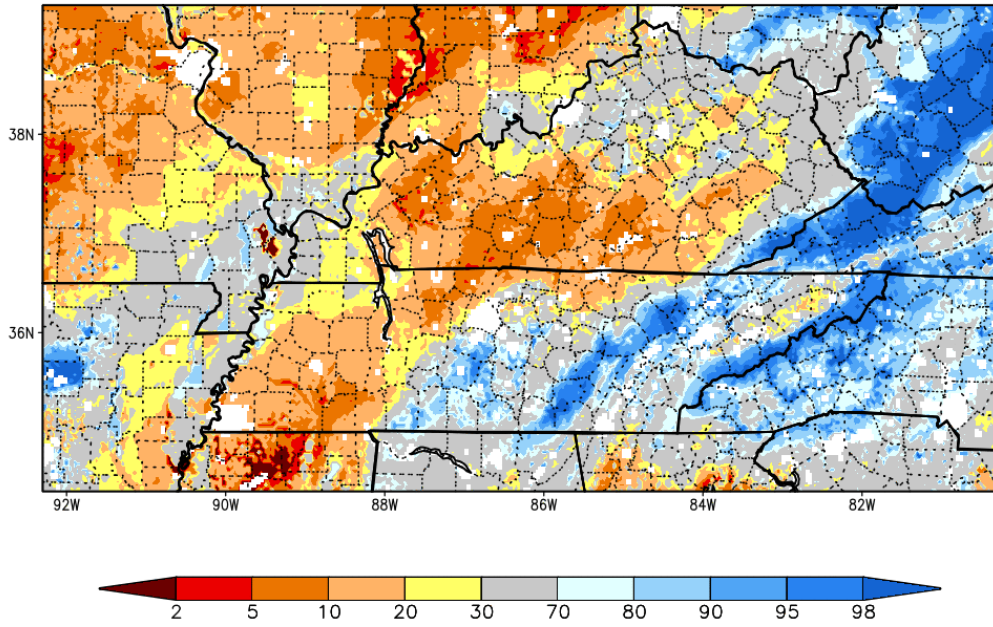
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement

droughtmonitor.unl.edu

Soil Moisture:

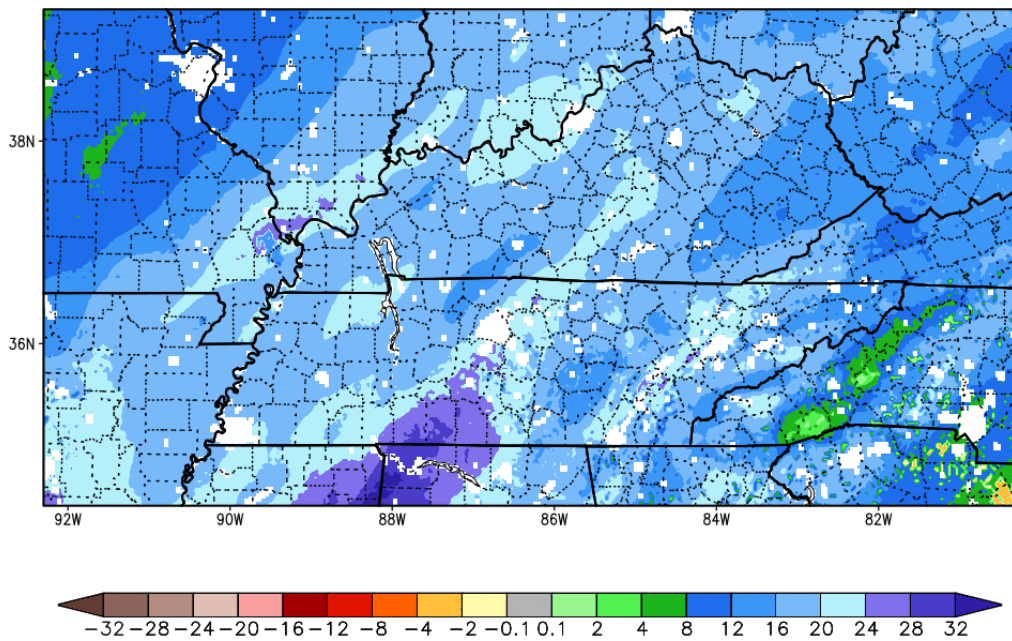
Heavy snow and rains helped to replenish soil moisture over the state, especially topsoil moisture levels, during January. At the end of the month the USDA rated topsoil moisture as 2% short, 38% adequate, and 60% surplus and rated subsoil moisture as 5% short, 69% adequate, and 26% surplus across Tennessee. The NASA SPoRT Land Information System still shows that much of West Tennessee, along with northern parts of Middle Tennessee still have below normal levels of soil moisture integrated over the top two meters of the ground. But southern sections of Middle Tennessee and most of East Tennessee show above normal levels of soil moisture in the top two meters of the ground. All areas of the state showed improvement in soil moisture percentiles, with southwestern parts of Middle Tennessee having the largest increase, in the range of 24-32 percentile.

SPoRT-LIS 0-2 m RSM percentile valid 31 Jan 2024



NOTE
Experimental

1-Month Difference in Column Relative Soil Moisture (%) valid 12z 31 Jan 2024



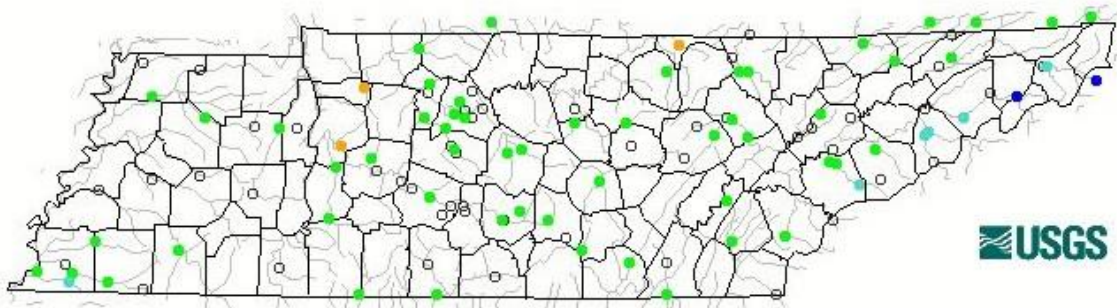
NOTE
Experimental

Streamflow:

Streamflow data averaged over the month of January showed that most areas of the state were within the normal range (25th-75th percentile), with some stream gauges in East Tennessee reporting above normal flow rates for the month. There were also a few isolated gauges in Middle Tennessee and the Cumberland Plateau that had below normal streamflow for the month.

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

January 2024



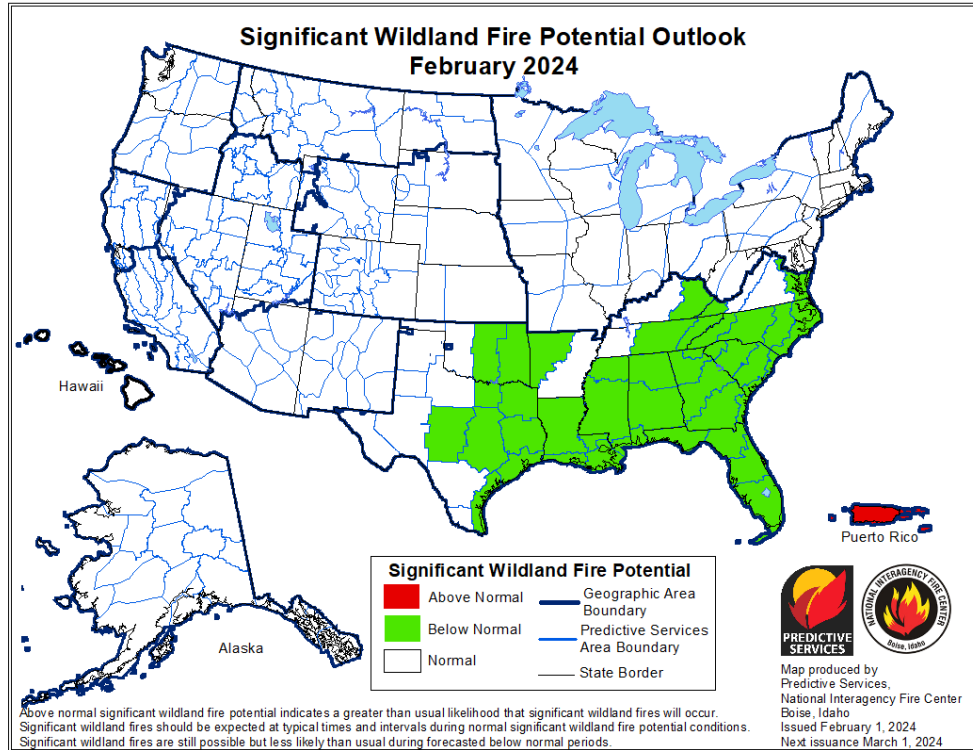
Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Miscellaneous:

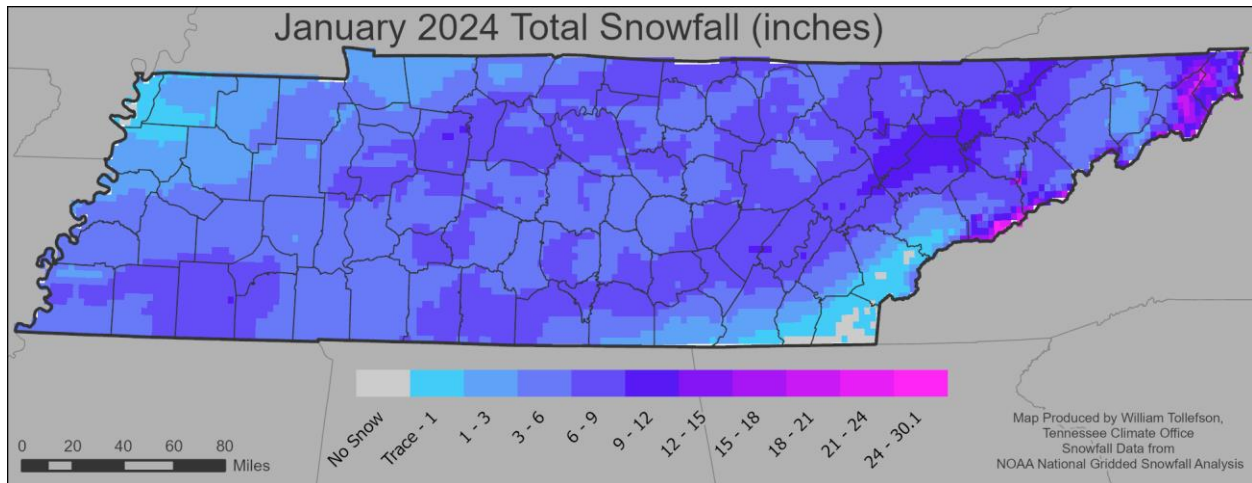
Crop Conditions from USDA: Heavy snow and heavy rains have helped to replenish soil moisture and recover from the fall and early winter drought, but the snow and rain also made pastures and fields very muddy and some minor flooding was even reported. The bigger impact on agricultural concerns was the cold weather and snow forcing cattle producers to feed extra hay, depleting some forage stores. Hay and roughage supplies were rated 6% very short, 30% short, 57% adequate, and 7% surplus. The table below shows conditions for other crops and ag products for the end of January.

Crop	Very Poor	Poor	Fair	Good	Excellent
Winter Wheat	3%	12%	35%	41%	9%
Pasture and Range	6%	23%	43%	26%	2%
Cattle	1%	7%	33%	51%	8%

Fire Danger: The National Interagency Fire Center’s significant wildland fire potential outlook shows that East and Middle Tennessee will have a below normal potential for significant wildland fires, while West Tennessee will have normal potential for February. This is likely due to some lingering drought impacts in the west.



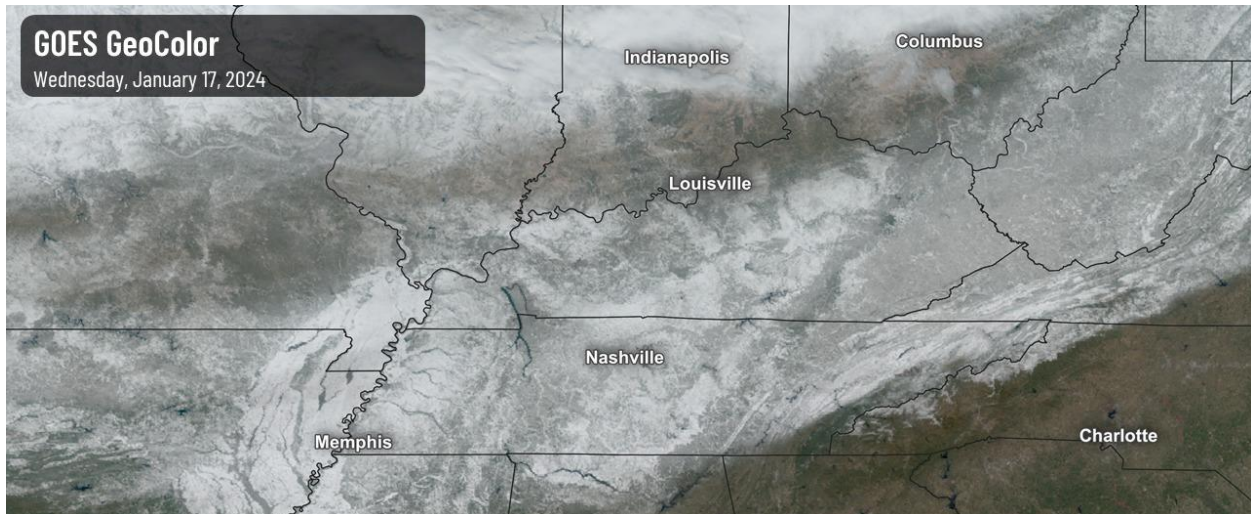
Snowfall: Record-setting snow fell over parts of Tennessee this month, with a total of 279 weather stations reporting measurable snowfall in January, and an additional 11 stations reporting a trace of snow (less than 0.1-inch). For most areas of the state this month brought more snow than the entire year of 2023. Beyond the impressive snow totals, the arctic air that settled into the state after the snow storm led to prolonged snow coverage, with many areas having snow on the ground for over a week!



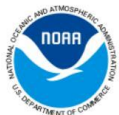
Story of the Month:

The major story of January 2024 was the strong winter storm and prolonged arctic air outbreak that impacted the state from January 14-24. The cold air and winter weather first impacted western portions of the state starting on January 14 and then spread eastward over the next 24-48 hours. State-wide, snowfall totals of 2+ inches were common with many areas recording over 6-inches of snow and three weather stations reporting over a foot of snow! As the skies cleared on January 17 the swath of snow

across the state was clearly visible in satellite imagery. With only a small portion of southeast Tennessee being clear of snow cover. In this area a wedge of warm air was trapped against the mountains leading most of the precipitation to come in the form of rain instead of snow.



Visible satellite imagery from Wednesday January 17 shows most of the state covered in snow, with only a few areas of southeast Tennessee free from snow.



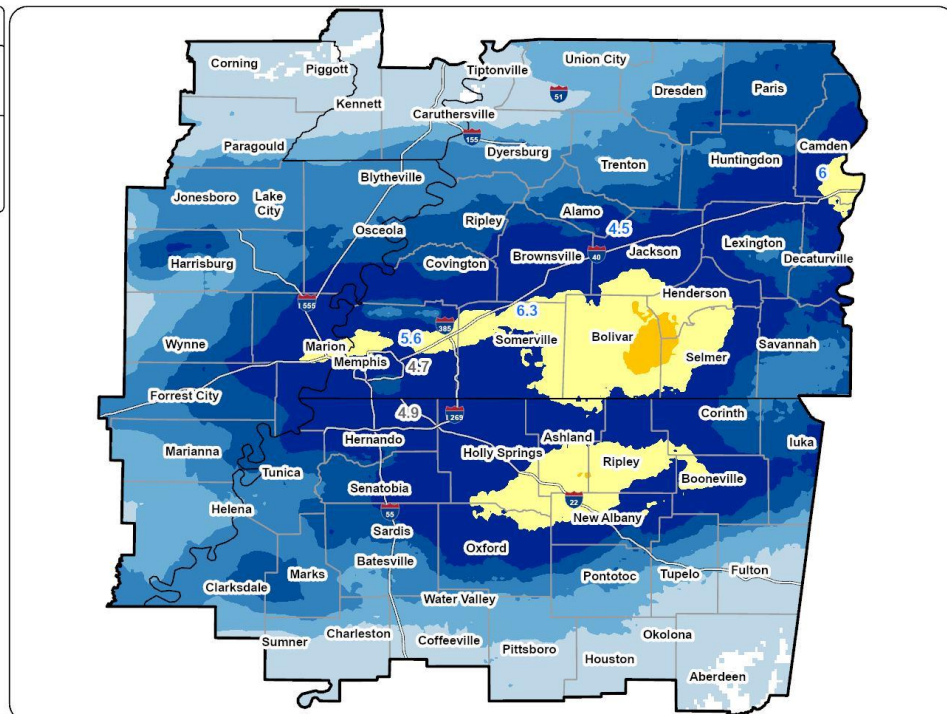
National Weather Service Memphis Tennessee



Snowfall Accumulation 6AM 01/14/2024 - 6AM 01/16/2024

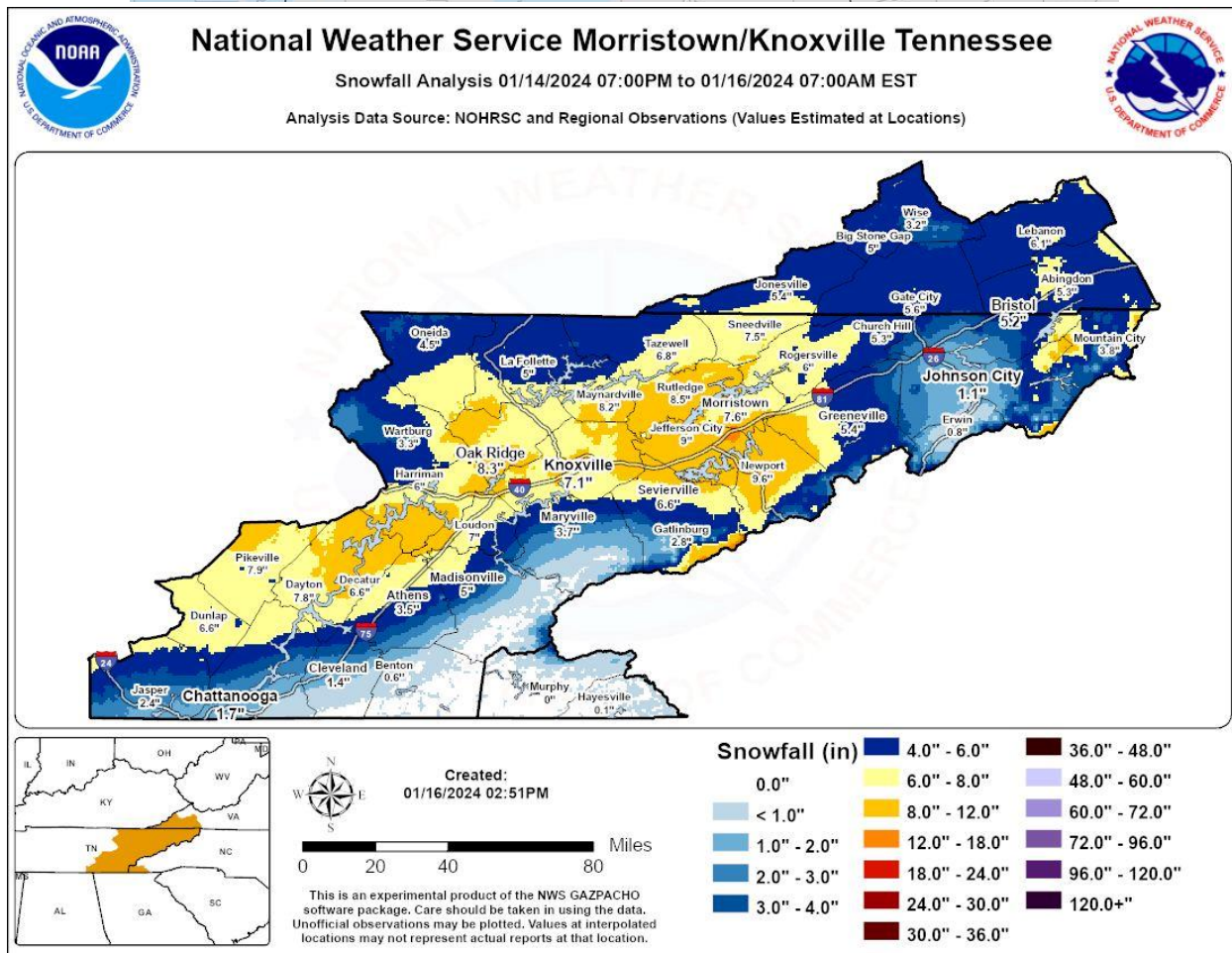
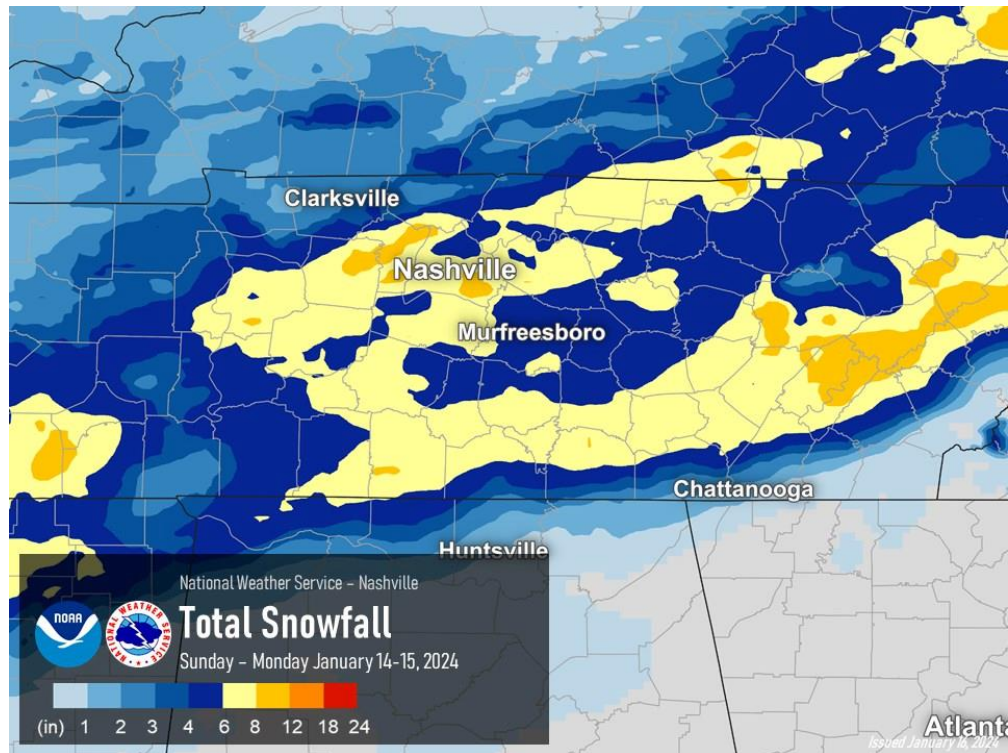


Snowfall (In)



This map is an interpolation of actual reported values, but should be considered an estimation only. Not all reports used in the analysis will be displayed due to space constraints. Values may be estimated at locations and do not reflect official climate data. Reports are snowfall through the above mentioned period.





A very cold airmass then settled over the state for the following week, with temperatures staying below freezing for several days, and many areas of the state having snow on the ground until the following Wednesday. Windchill warnings and advisories were issued across the state as air temperatures dropped into the single digits or even below zero across the state with the coldest temperatures reported on the 17th and 18th. Across the state, 74 weather stations reported sub-zero temperatures, with 21 stations reporting temperatures of -10°F or colder! The UT Middle Tennessee AgResearch and Education Center in Lewisburg recorded the coldest temperature, with a low of -18°F on the morning of January 17.



12HR Min Temps (°F)			
Liberty		-13	
De Kalb 610ft			
Lawrenceburg Airport	-13	Pulaski Abernathy Field	-13
Lewisburg Ellington Airport	-13	Sparta-Cookeville Airport	-13
Lascassas	-12	Watertown	-12
2 SSE Kingston Springs	-12	Mcminnville Airport	-11
Shelbyville Bomar Field	-11	Readyville	-10
Woodbury	-10	Morrison	-10
Midway-Bradyville	-10	6 SW Franklin	-9
Manchester	-9	Gallatin	-9
Bell Buckle	-9	Culleoka	-9
Dickson	-9	Clifton	-8
3 N Fairfield Glade	-8	Chapel Hill	-8
Leoma	-8	Murfreesboro	-8
Nolensville	-8	Lebanon Municipal Airport	-8
Smyrna Airport	-8	Columbia Airport	-8
Elkton Allen Farms	-7	Spring Hill	-7
Joelton	-7	Manchester	-7
Murfreesboro	-6	Pleasant View	-6
Eagleville	-6	Mount Pleasant	-6
New Johnsonville	-5	Carthage	-5

valid as of Wed Jan 17th 05:57 am - NWS Nashville

Minimum temperatures reported in the NWS-Nashville office county warning area.

At one point during the storm every school system in the state was closed due to the extreme weather, and many districts remained closed for a week as ice-covered roads prevented students and faculty from safely reaching schools. Unfortunately, the winter weather proved deadly, with the Tennessee Department of Health reporting a total of 36 weather-related fatalities in connection with the winter storm and cold air outbreak. Numerous communities were under boil water advisories due to frozen pipes and other winter-weather related issues with water supply systems. The snow and then prolonged cold led to some power outages, with up to 2,000 customers without power on January 16, and the TVA along with state agencies asking the public to conserve energy when possible to reduce demand during the coldest periods of the week.

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 were no reports of tornado or severe thunderstorm damage in Tennessee during January 2024.

CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center's outlooks for February show that most of Tennessee will have equal chances for above normal, below normal, or normal temperatures and precipitation patterns. However, the northwest corner of the state slightly leaning towards a warmer and drier than normal pattern for the month.

