

September 2021 Tennessee State Climate Summary

Tennessee Climate Office * East Tennessee State University

Prepared by William Tollefson and Dr. Andrew Joyner

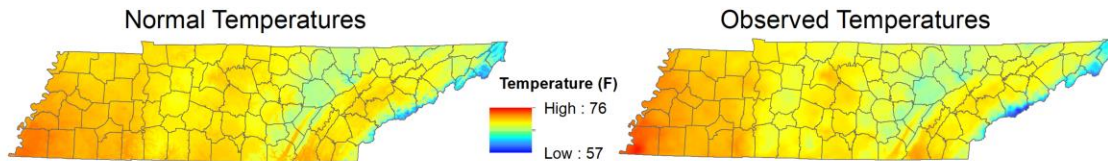
With contributions by [Climate Data Representatives](#) across the state

Monthly Temperature Summary:

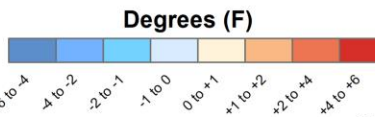
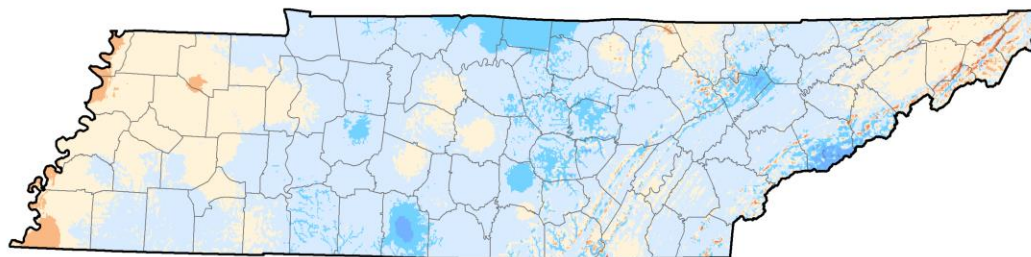
Temperatures for September were close to normal for most areas of the state (within 1°F of the 1991-2020 normals). The month started out cooler than normal with central portions of the state recording temperatures 3-4°F below normal for the first week of September. Temperatures moderated a bit but remained slightly below normal for the second week of the month. A relative warm spell moved across the state in the third week of the month with temperature 2-4°F above normal for most areas, with the northeast and northwest corners recording temperatures 4-6°F above normal that week. The first major cold front of the Fall season swept the state on the last day of summer/first day of fall (Sep 21-22) ushering in cooler than normal temperatures for the last week of the month. From September 22-28 temperatures in the eastern half of the state averaged 4-6°F below normal, while the western half was a bit less extreme with temperatures running 2-4°F below normal for the week.



September 2021 Mean Temperature



Departure From Normal Temperatures



Stations with the highest mean temperature

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	75.9
SHILOH NMP TENNESSEE	RAWS	73.4
MEMPHIS WFO	WBAN	73.2
DYERSBURG MUNICIPAL AIRPORT	WBAN	72.9
CHATTANOOGA AP	WBAN	72.8

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	52.8
NEWFOUND GAP	COOP	58.9
ROAN MOUNTAIN 3SW	COOP	61.1
CHEROKEE TENNESSEE	RAWS	64
TOWNSEND 5S	COOP	64.3

Monthly Precipitation Summary:

Precipitation varied widely from the normal amount for September across the state; parts of Lauderdale County in West Tennessee recorded less than 20% normal, while parts of Middle Tennessee recorded over 250% normal! Generally, West Tennessee and parts of Northeast Tennessee were drier than normal while Middle Tennessee and most of East Tennessee recorded above normal precipitation. The heaviest rainfall occurred in the third week of the month (September 15-21) when many locations in Middle Tennessee and the southern Cumberland Plateau reported over 6-inches of rain, with parts of Bedford, Rutherford, and Coffee Counties recording over 10-inches in the week. Outside of this heavy rainfall period for Middle Tennessee, other rainfall events were generally light and localized.

There were 38 broken and 1 tied daily rainfall records set this month across the state, 13 of which were set at stations that have over 100-year observation histories. The highest daily rainfall record for stations with at least 30-years of history was set at Tullahoma on September 19, when the station recorded 4.65-inches of rain, which was the rainiest September day recorded in the station’s 128-year record. On this same day, another COOP station in Coffee County also reported 6.62-inches of rain, and a CoCoRaHS observer in Bledsoe County, on the Cumberland Plateau, reported 8.21” of rain. The Fayetteville Water Treatment Plant weather station reported the wettest September in the station’s 62-year history, Tullahoma reported the 2nd wettest September in the station’s 128-year history, and Dickson reported the 3rd wettest September in the station’s 116-year history. It was the 6th wettest and 8th wettest Septembers for the Oak Ridge (75-year history) and Chattanooga (143-year history) areas.

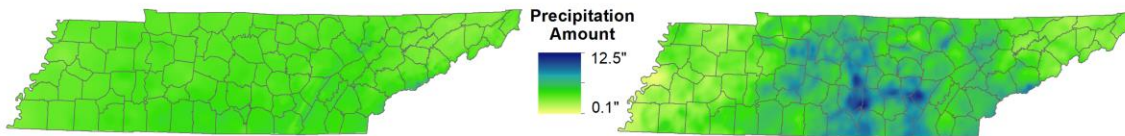


September 2021 Precipitation

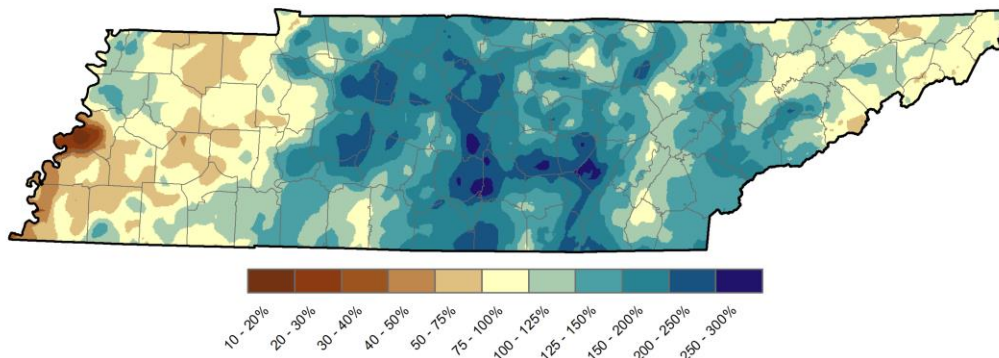


Normal Precipitation

Observed Precipitation



Percent Normal Precipitation



Stations with the most precipitation

Station Name	Station Type	Total Precipitation (in)
PIKEVILLE 8.2 WSW	CoCoRaHS	15.53
TULLAHOMA 4NE	COOP	11.85
MURFREESBORO 3.8 SSE	CoCoRaHS	11.19
SHELBYVILLE WATER DEPT	COOP	11.17
MT LECONTE	COOP	11.07

Stations with the least precipitation

Station Name	Station Type	Total Precipitation (in)
OLD HICKORY DAM	COOP	1.5
KINGSPORT	COOP	1.58
GERMANTOWN 4SE	COOP	1.58
JACKSON 4.3 N	CoCoRaHS	1.63
BRISTOL AP	WBAN	1.67

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

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 climate normals:

Station Name	Temperatures (°F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
Memphis	85.5	66.2	75.9	-0.1	91	9/13	52	9/23	2.03	-1.00	67%
Jackson	83.1	59.7	71.4	-0.3	90	9/13	45	9/23	2.42	-1.16	68%
Clarksville	80.4	59.2	69.8	-0.8	88	9/14	45	9/26	2.70	-0.77	78%
Nashville	82.7	62.4	72.6	-0.5	91	9/14	49	9/24	4.47	0.67	118%
Chattanooga	82.5	63.1	72.8	-1.1	90	9/14	48	9/24	6.67	2.44	158%
Crossville	75.9	56.5	66.2	-0.8	83	9/14	41	9/24	3.42	-0.72	83%
Knoxville	80.7	61.0	70.9	-0.9	88	9/14	45	9/24	1.72	-1.77	49%
Bristol	81.5	56.2	68.8	0.2	90	9/18	43	9/25	1.67	-1.17	59%

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
CHEATHAM LOCK & DAM	COOP	94	16
WOODBURY 1 WNW	COOP	92	30
LYNCHBURG	COOP	91	14
JACKSON EXP STA	COOP	91	14
NASHVILLE BERRY FIELD	COOP	91	15
MOUSETAIL LANDING STATE PARK	COOP	91	15
CAMDEN TOWER TENNESSEE	RAWS	91	13
MERIWETHER LEWIS TENNESSEE	RAWS	91	13
SHILOH NMP TENNESSEE	RAWS	91	13
MEMPHIS INTERNATIONAL AP	WBAN	91	13
MEMPHIS WFO	WBAN	91	14
NASHVILLE INTL AP	WBAN	91	14

Ten stations tied for the 3rd hottest temperature (91°F)

Coldest Stations (lowest minimum temperature)

Station Name	Station Type	Lowest Temperature (F)	Date
MT LECONTE	COOP	28	24
NEWFOUND GAP	COOP	35	24
ROAN MOUNTAIN 3SW	COOP	36	24
CHEROKEE TENNESSEE	RAWS	36	24
ERWIN 1 W	COOP	37	26
COALMONT	COOP	38	24
MILAN EXP STN	COOP	39	24
TOWNSEND 5S	COOP	39	25
FALL CREEK FALLS SP	COOP	39	24
BLEDSON SF TENNESSEE	RAWS	39	24
CROSSVILLE AREA OFFICE TENNESS	RAWS	39	24

Five stations tied for the 7th coldest temperature (39°F)

Warmest Stations (highest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MEMPHIS INTERNATIONAL AP	WBAN	75.9
SHILOH NMP TENNESSEE	RAWS	73.4
MEMPHIS WFO	WBAN	73.2
DYERSBURG MUNICIPAL AIRPORT	WBAN	72.9
CHATTANOOGA AP	WBAN	72.8
GERMANTOWN 4SE	COOP	72.7
NASHVILLE INTL AP	WBAN	72.6
JACKSON EXP STA	COOP	72.5
BROWNSVILLE	COOP	72.5
AMES PLANTATION	COOP	72.3

Coollest Stations (lowest mean temperatures)

Station Name	Station Type	Mean Temperature (F)
MT LECONTE	COOP	52.8
NEWFOUND GAP	COOP	58.9
ROAN MOUNTAIN 3SW	COOP	61.1
CHEROKEE TENNESSEE	RAWS	64
TOWNSEND 5S	COOP	64.3
CROSSVILLE EXP STN	COOP	64.7
GATLINBURG 2 SW	COOP	64.8
CROSSVILLE 7 NW	WBAN	64.9
COALMONT	COOP	65
ONEIDA	COOP	66
FALL CREEK FALLS SP	COOP	66

Two stations tied for the 10th coolest mean temperature (66°F)

Wettest Stations (highest precipitation totals):

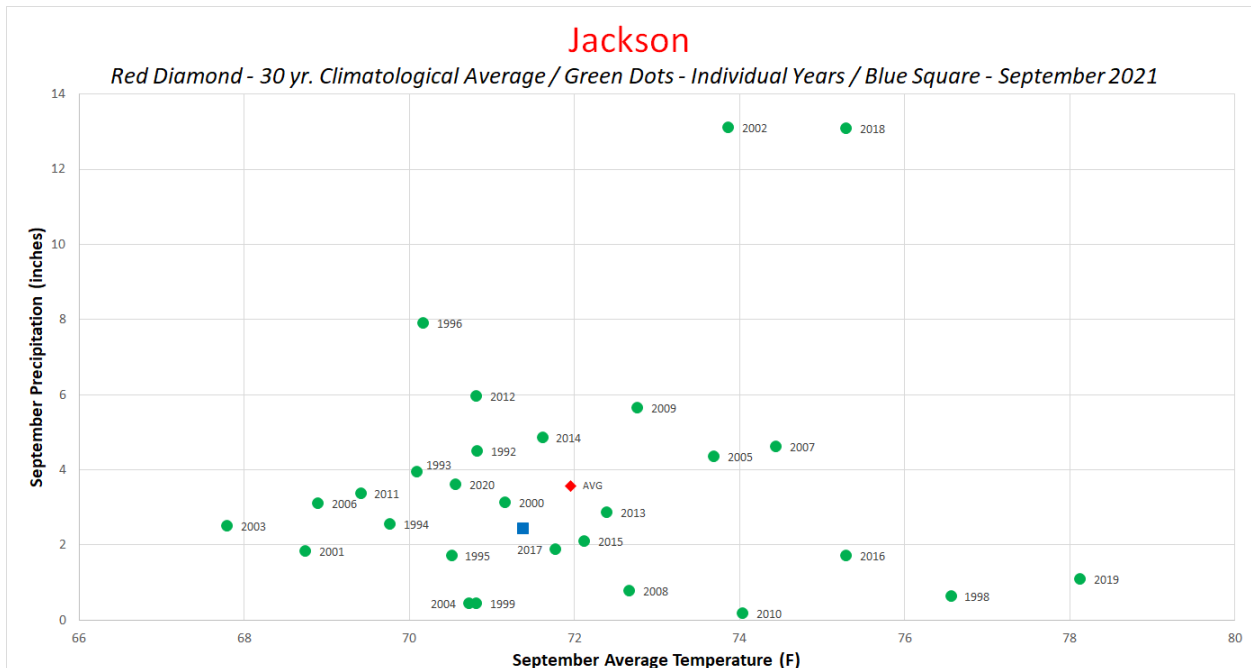
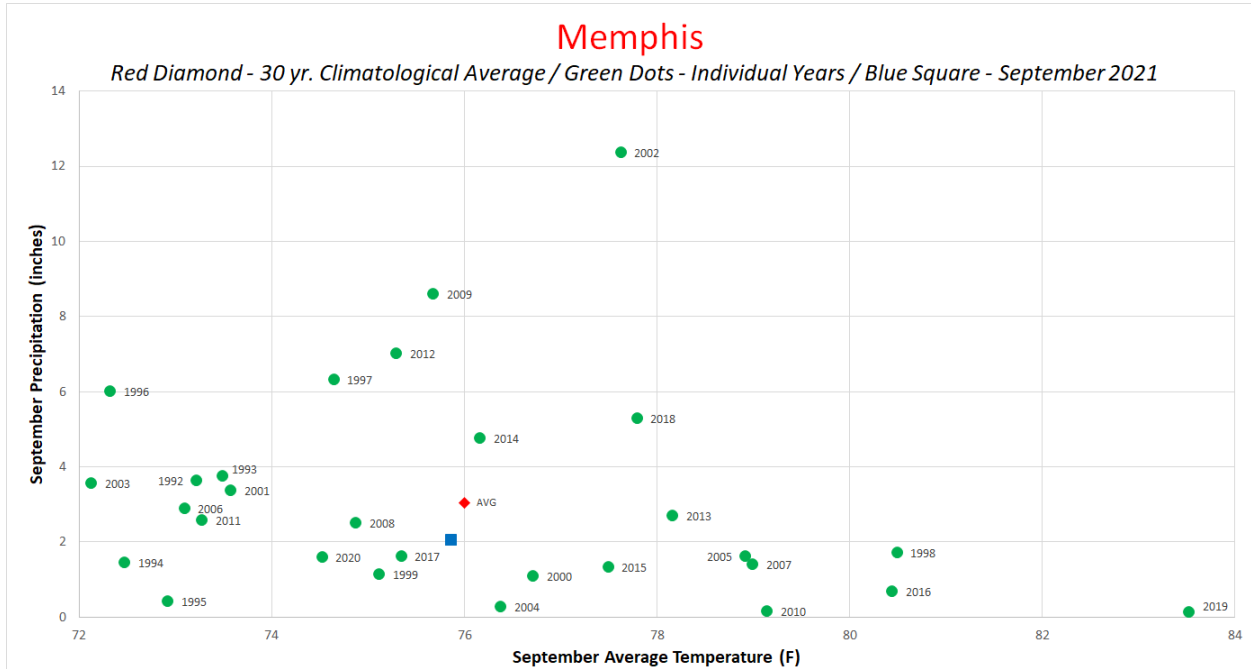
Station Name	Station Type	Total Precipitation (in)
PIKEVILLE 8.2 WSW	CoCoRaHS	15.53
TULLAHOMA 4NE	COOP	11.85
MURFREESBORO 3.8 SSE	CoCoRaHS	11.19
SHELBYVILLE WATER DEPT	COOP	11.17
MT LECONTE	COOP	11.07
SMYRNA 3.0 ESE	CoCoRaHS	10.34
SHELBYVILLE 3.1 ESE	CoCoRaHS	10.13
MCMINNVILLE 8.5 ESE	CoCoRaHS	10.1
MURFREESBORO 4.3 SE	CoCoRaHS	9.98
KINGSTON SPRINGS 1.4 SW	CoCoRaHS	9.83

Driest Stations (lowest precipitation totals):

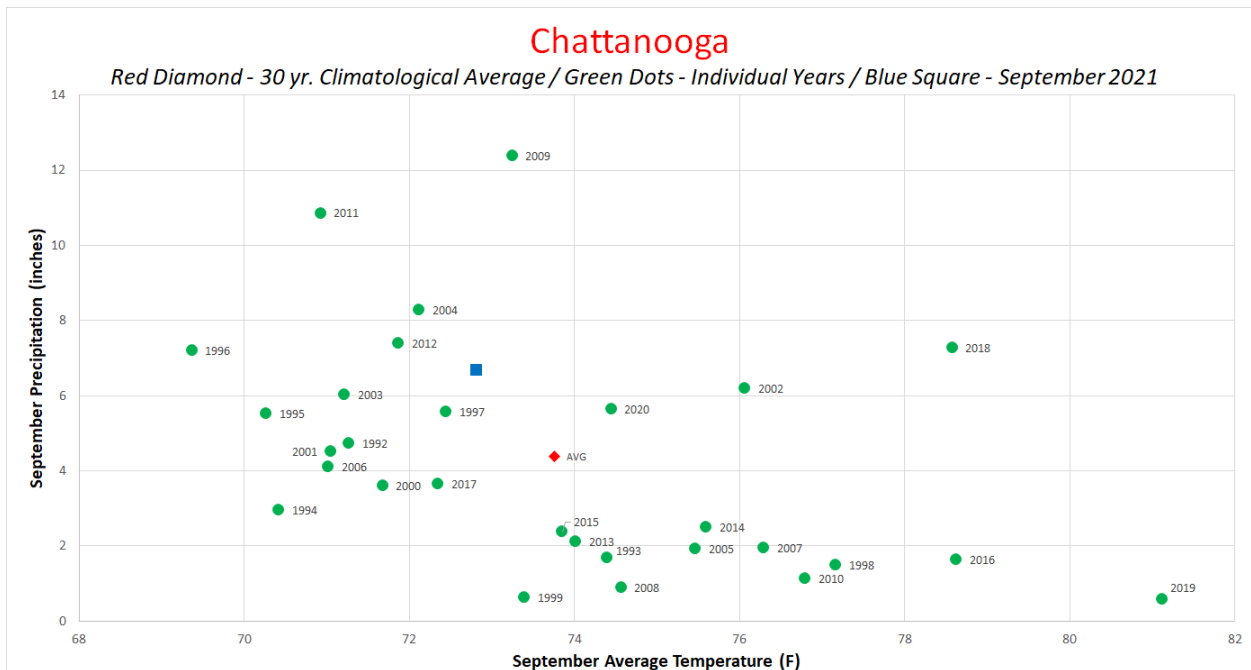
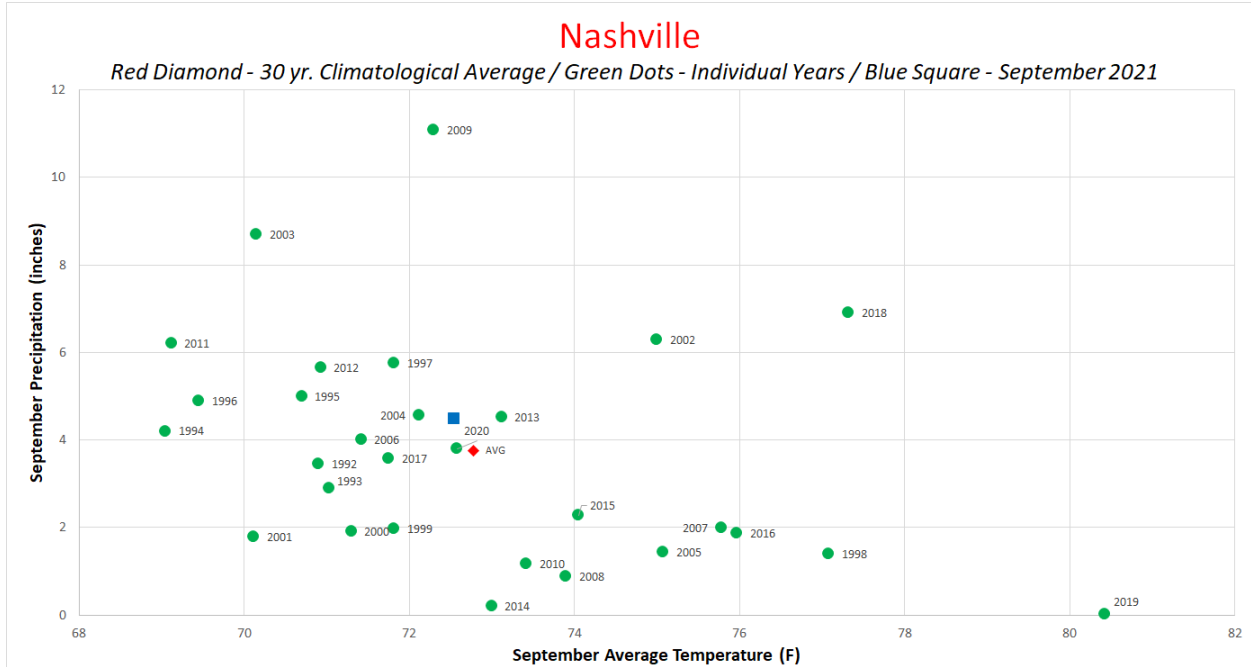
Station Name	Station Type	Total Precipitation (in)
OLD HICKORY DAM	COOP	1.5
KINGSPORT	COOP	1.58
GERMANTOWN 4SE	COOP	1.58
JACKSON 4.3 N	CoCoRaHS	1.63
BRISTOL AP	WBAN	1.67
BARTLETT 3.1 NNE	CoCoRaHS	1.71
BROWNSVILLE	COOP	1.71
SOMERVILLE 10N	COOP	1.71
KNOXVILLE AP	WBAN	1.72
JACKSON 4.7 NW	CoCoRaHS	1.79

The Month in Comparison:

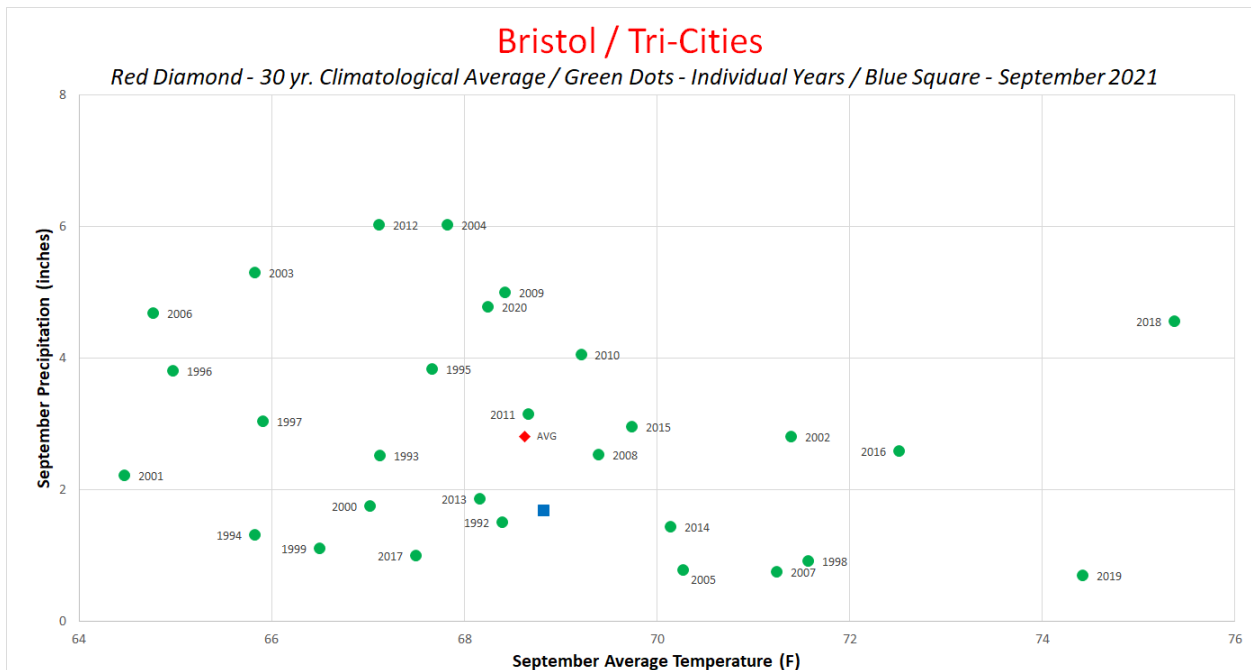
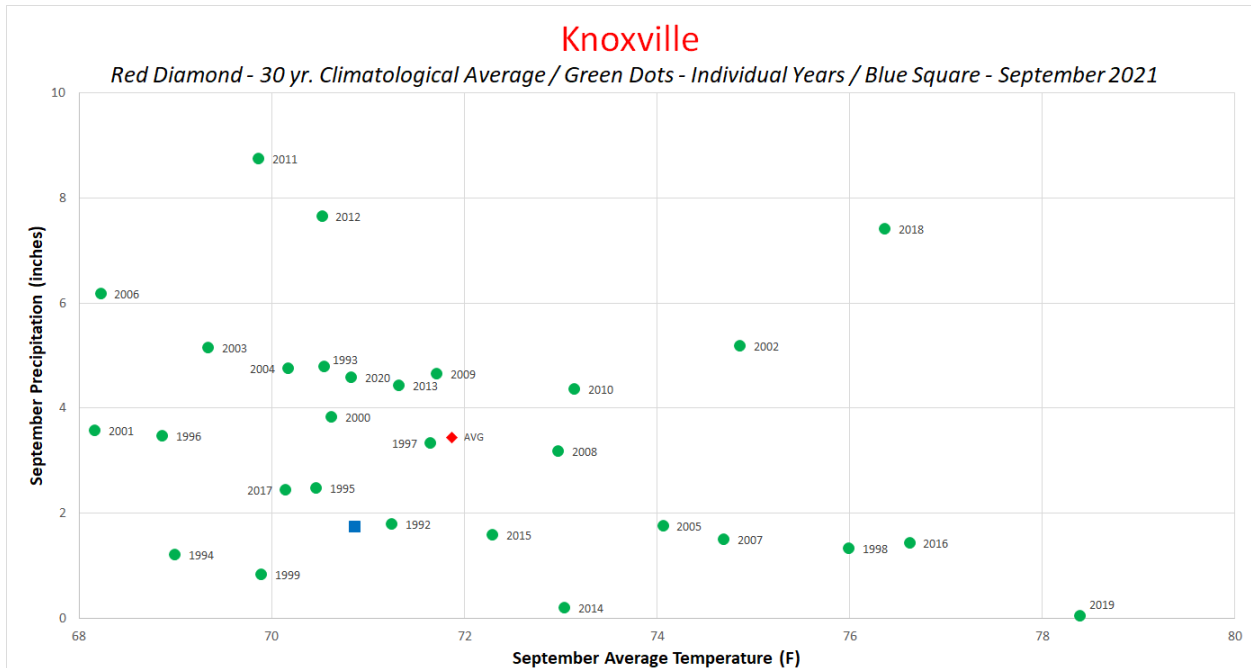
Comparing the average temperature and total precipitation of September 2021 to those values for September in the previous thirty years, the close to average temperatures are apparent, with all airport weather stations being within a degree of their average for the past thirty Septembers. Precipitation was a little more variable, with Memphis, Jackson, Knoxville, and the Tri-Cities recording below average rainfall while Nashville and Chattanooga recorded above average rainfall for the month; however, it was not among the top-5 wettest or driest Septembers of the past thirty years for any station.



September 2021 Tennessee State Climate Summary



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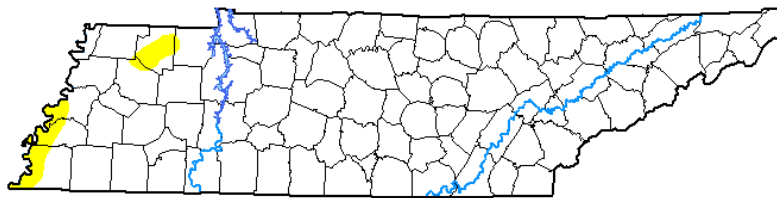
Drought Monitor:

In the last release of the US Drought Monitor for September there were two remaining small areas of D0 (Abnormally Dry) conditions in West Tennessee centered on the western sides of Lauderdale, Tipton, and Shelby counties, and in Weakley County. These areas of D0 totaled to 2.57% of the state’s area, which is slightly more than the 1.79% of the state covered by D0 at the end of August. During the month, D0 conditions expanded in Weakley County and in the western portions of Lauderdale and Shelby counties, while eastern portions of Shelby and Tipton counties were removed from D0. D0 coverage peaked in the Drought Monitor release for September 14, when 3.91% of the state’s area was covered in abnormally dry conditions, located in the same two regions where it persisted through the end of the month.

Author:
 Brian Fuchs
 National Drought
 Mitigation Center

U.S. Drought Monitor Tennessee

September 28, 2021
 (Released Thursday, Sep. 30, 2021)
 Valid 8 a.m. EDT



Intensity:

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

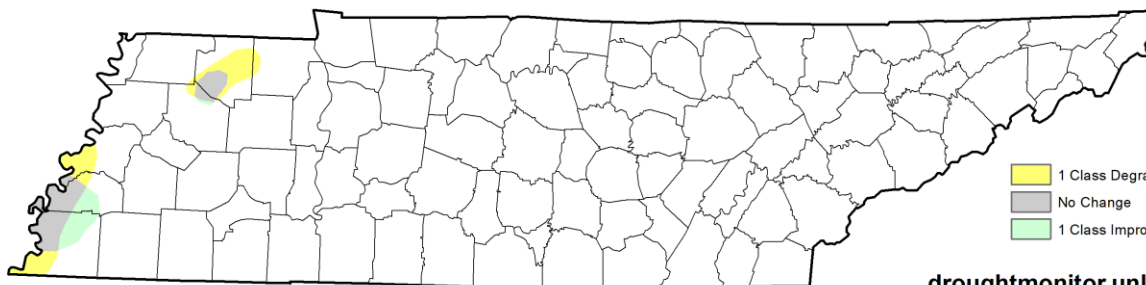
droughtmonitor.unl.edu



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>

September 28, 2021
 compared to
 August 31, 2021

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



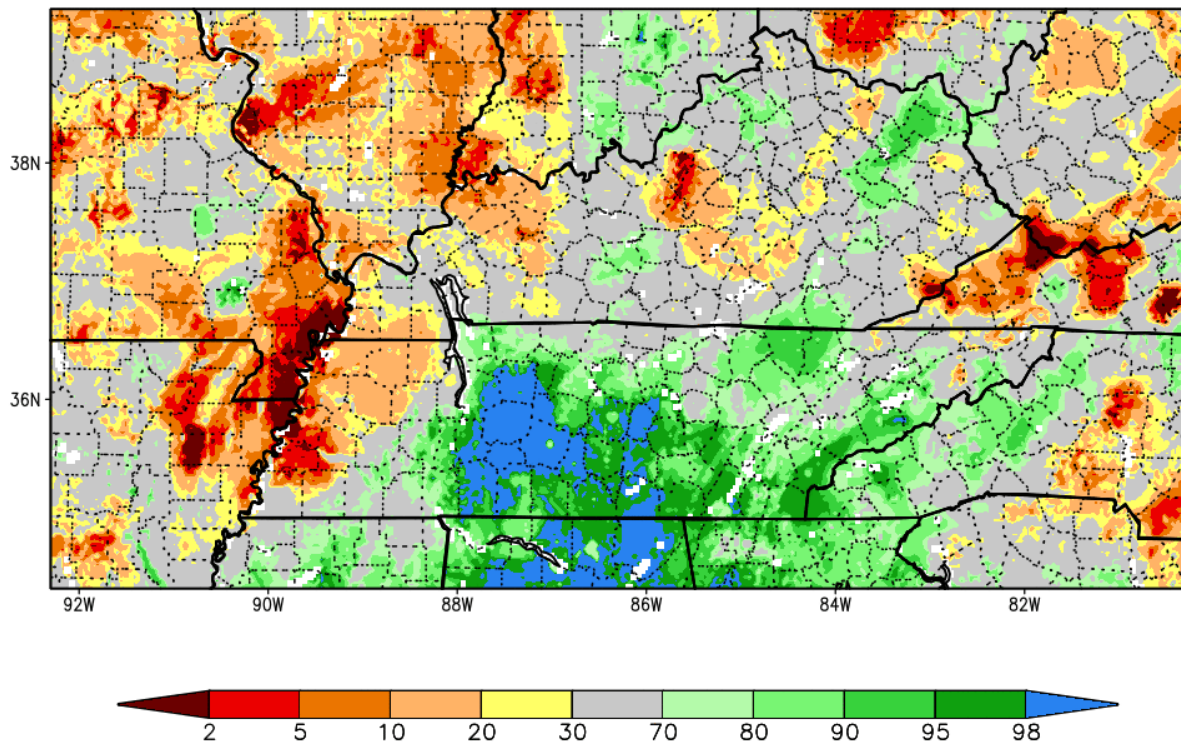
- 1 Class Degradation
- No Change
- 1 Class Improvement

droughtmonitor.unl.edu

Soil Moisture:

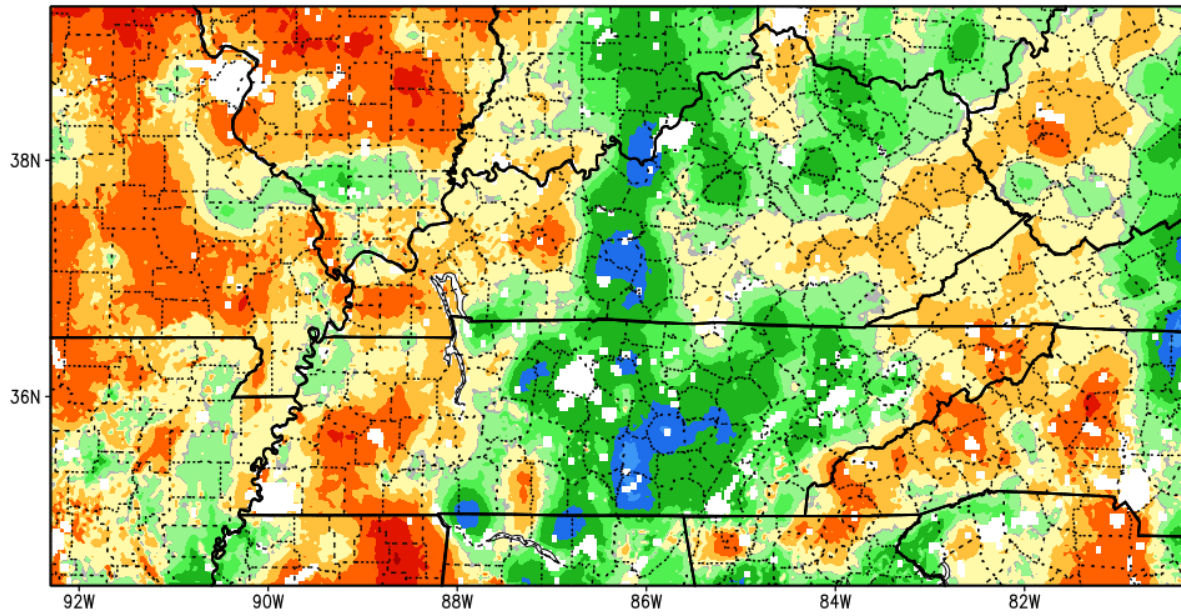
Soil Moisture maps from the NASA SPoRT Land Information System show a large area of soil moisture surplus in Middle Tennessee and most of East Tennessee, with a few areas of drier than normal soil moisture in the northeast corner of the state. Large portions of West Tennessee show below normal soil moisture. They also show a general drying trend in West Tennessee and in northeast Tennessee while Middle Tennessee and most of East Tennessee saw an increase in soil moisture levels over September. On September 27, the USDA reported topsoil moisture as 10% short, 70% adequate, and 20% surplus; while subsoil moisture was reported as 2% very short, 10% short, 73% adequate, and 15% surplus.

SPoRT-LIS 0-200 cm Soil Moisture percentile valid 30 Sep 2021



****NOTE****
****Experimental****

1-Month Difference in Column Relative Soil Moisture (%) valid 12z 30 Sep 2021



****NOTE****
****Experimental****

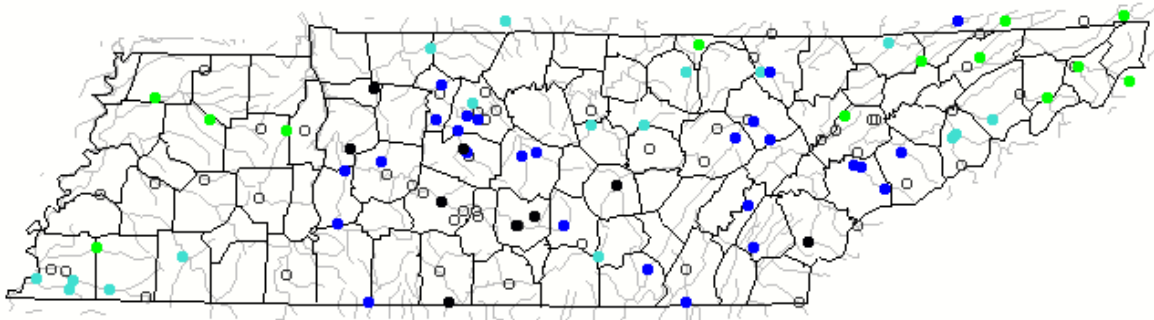
Streamflow:

Streamflow was in the normal to much above normal categories across the state for the month of September. Northeast Tennessee and most of West Tennessee, the drier portions of the state this month, had streamflow in the normal range; while most of East Tennessee and Middle Tennessee had much above normal streamflow, and several gauges on the Duck River in Middle Tennessee entered into flood stage after a week of heavy rains in the middle of the month (read more about this in the Story of the Month section).

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

Tennessee or Water-Resources Regions

September 2021



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

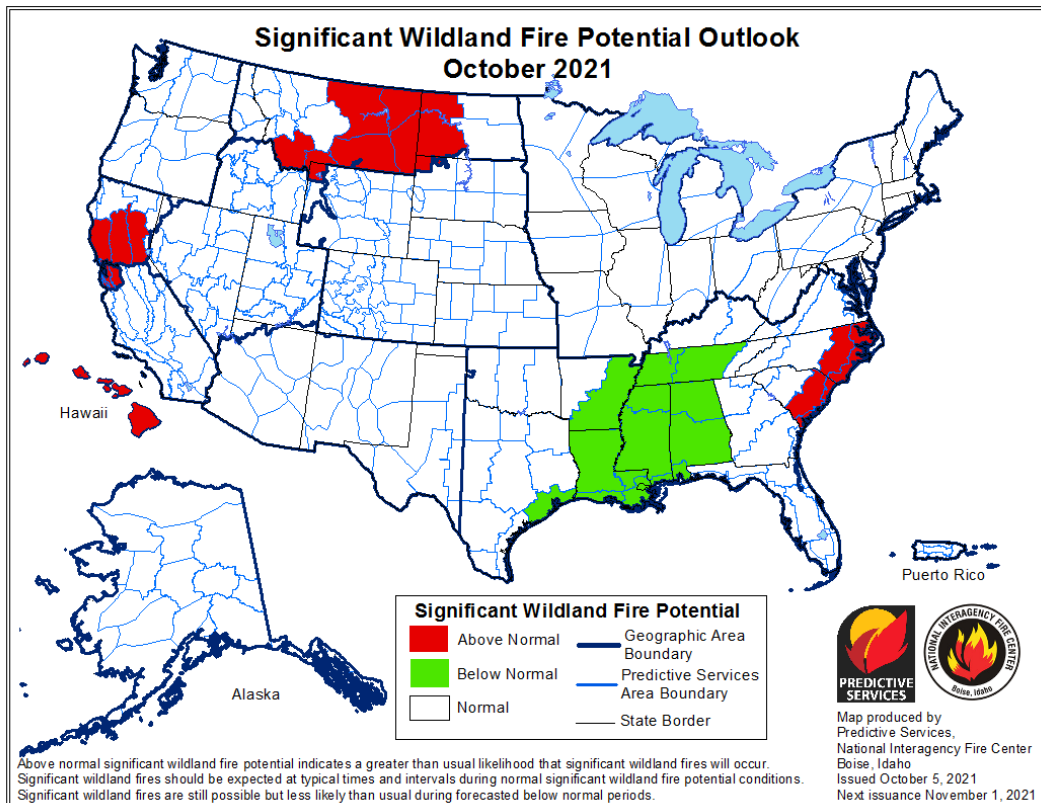
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Miscellaneous:

Crop Conditions from USDA: By the end of September the main concerns for agriculture across the state were flooded fields and wet conditions keeping farmers out of their fields in Middle Tennessee. Army worms were also still a concern in Middle and East Tennessee, that combined with dryness in northeast Tennessee were of concern for pastures and hay producers in the region. Earlier in the month corn and soybean harvests started with good yields reported, but the percent of the crops harvested so far is a bit behind the 5-year average, mainly due to the timing of rains during the month. Winter wheat planting has also begun and is a bit ahead of the 5-year average progress so far.

CROP PROGRESS					CONDITION					
Crop	This Week	Last Week	2020	5 Year Avg.	Item	Very Poor	Poor	Fair	Good	Excellent
	Percent					Percent				
Corn – Dented	100	98	100	100	Pasture	2	7	28	53	10
Corn – Mature	90	79	87	94	Cotton	3	9	20	60	8
Corn – Harvested	43	31	38	62	Corn	0	2	16	58	24
Cotton – Bolls Opening	40	20	64	77	Soybeans	0	4	21	58	17
Soybeans – Dropping Leaves	48	37	50	61						
Soybeans – Harvested	9	5	11	15						
Tobacco – Cut	82	75	84	84						
Winter Wheat – Planted	11	8	5	5						
Winter Wheat – Emerged	4	1	3	1						

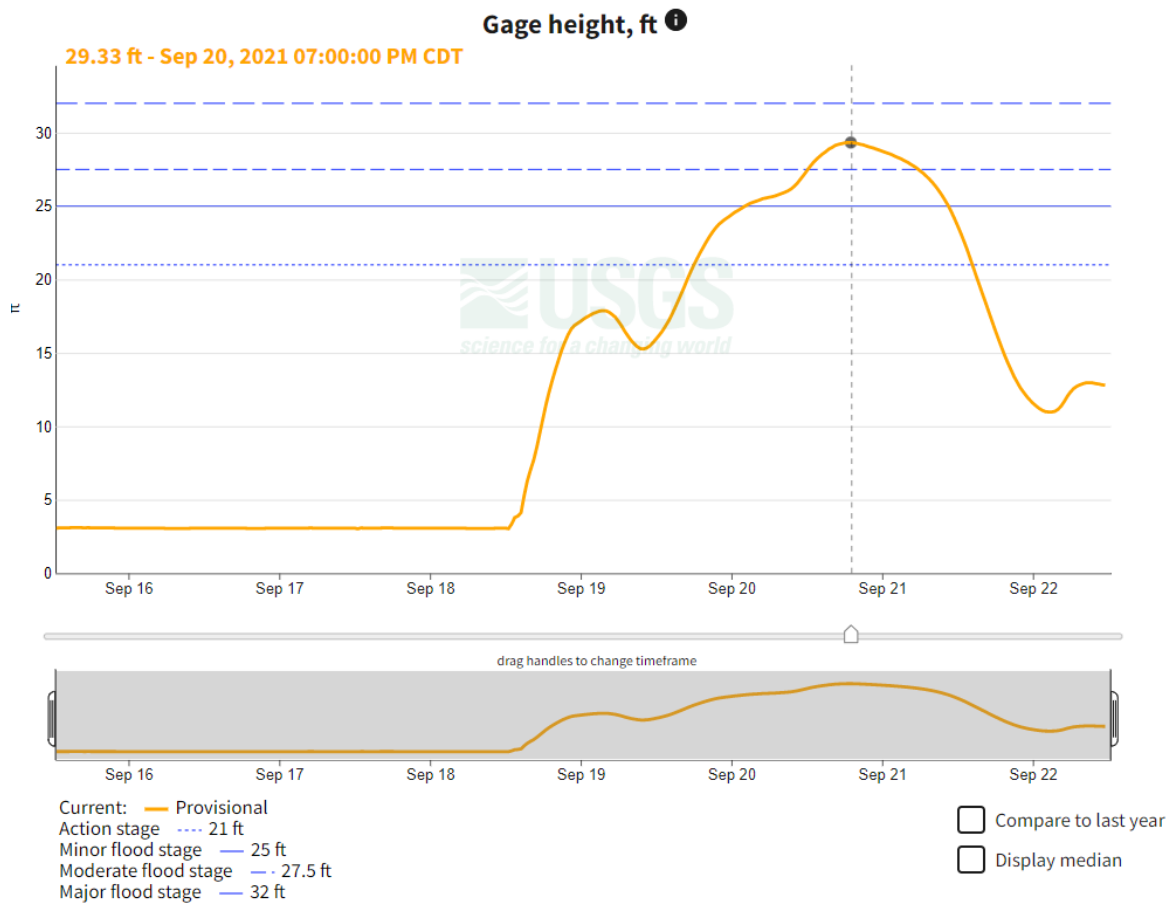
Fire Danger: The National Interagency Fire Center Shows West and Middle Tennessee with below normal potential for significant wildland fire in October, while East Tennessee is shown with normal potential for significant wildland fire in October.



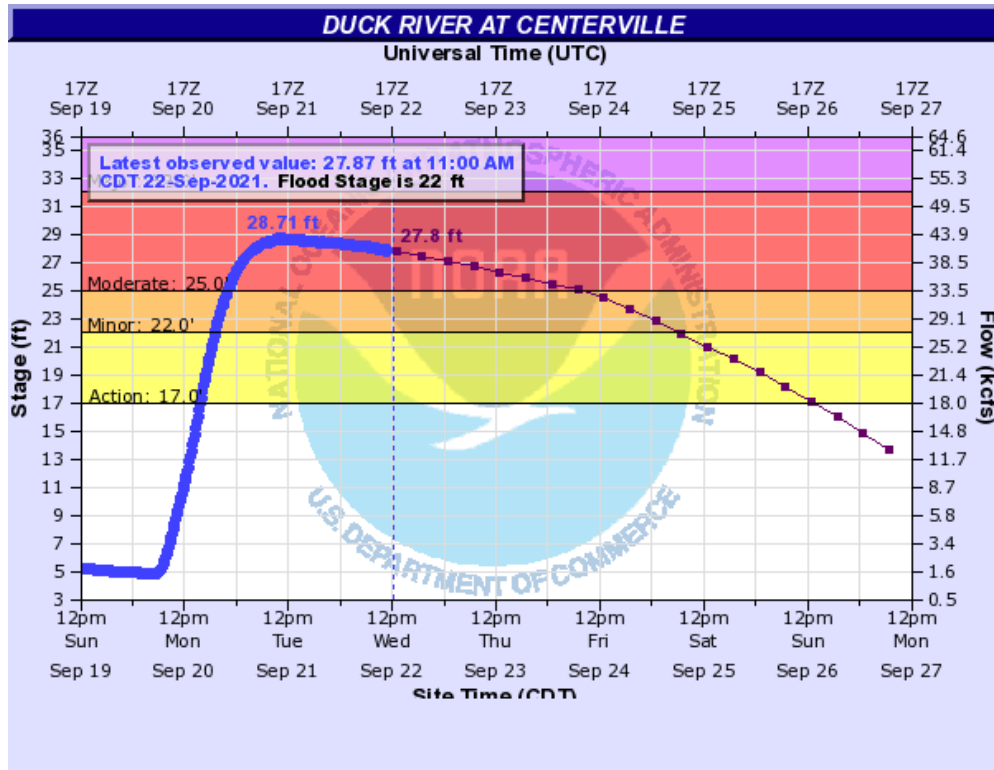
Story of the Month:

Once again, the major story of the month was heavy rainfall and flooding in portions of Middle Tennessee, although thankfully it was less intense than what we saw in August. Rains were spread out over a longer period, but some areas of southeast Middle Tennessee recorded a foot of rain over the week of the 15 – 21, which led to moderate flooding on the Duck River. More than 6-inches of rain were reported from the western portions of the Cumberland Plateau westward into Middle Tennessee, with 10-inches of radar estimated totals in parts of Bedford, Rutherford, and Coffee counties. This prompted some localized flash flooding and riverine flooding on the Duck River, with stream gauges at Centerville (Hickman County) and Shelbyville (Bedford County) reaching Moderate Flood Stage, and Hurricane Mills (Humphreys County) and Columbia (Maury County) reaching Minor Flood Stage in the later parts of the week.

This excessive rainfall also led to a significant water release from Normandy Dam in Bedford County, prompting an alert message from Bedford County Emergency Management alerting people to leave low laying areas downstream of the dam on the Duck River. However, the TVA stated that the release should not significantly impact downstream areas, and little impact was reported.



Duck River at Shelbyville



TVA Tennessee Valley Authority 
@TVAnews



The Duck River area near Tullahoma, TN received over 6" of rain in the last 24 hours. As a result, we are spilling at Normandy Dam to bring the lake's elevation down. Releases from the dam are below the threshold that would impact downstream areas. #TNWX tva.me/L8Yn50GcA4X



3:40 PM · Sep 19, 2021



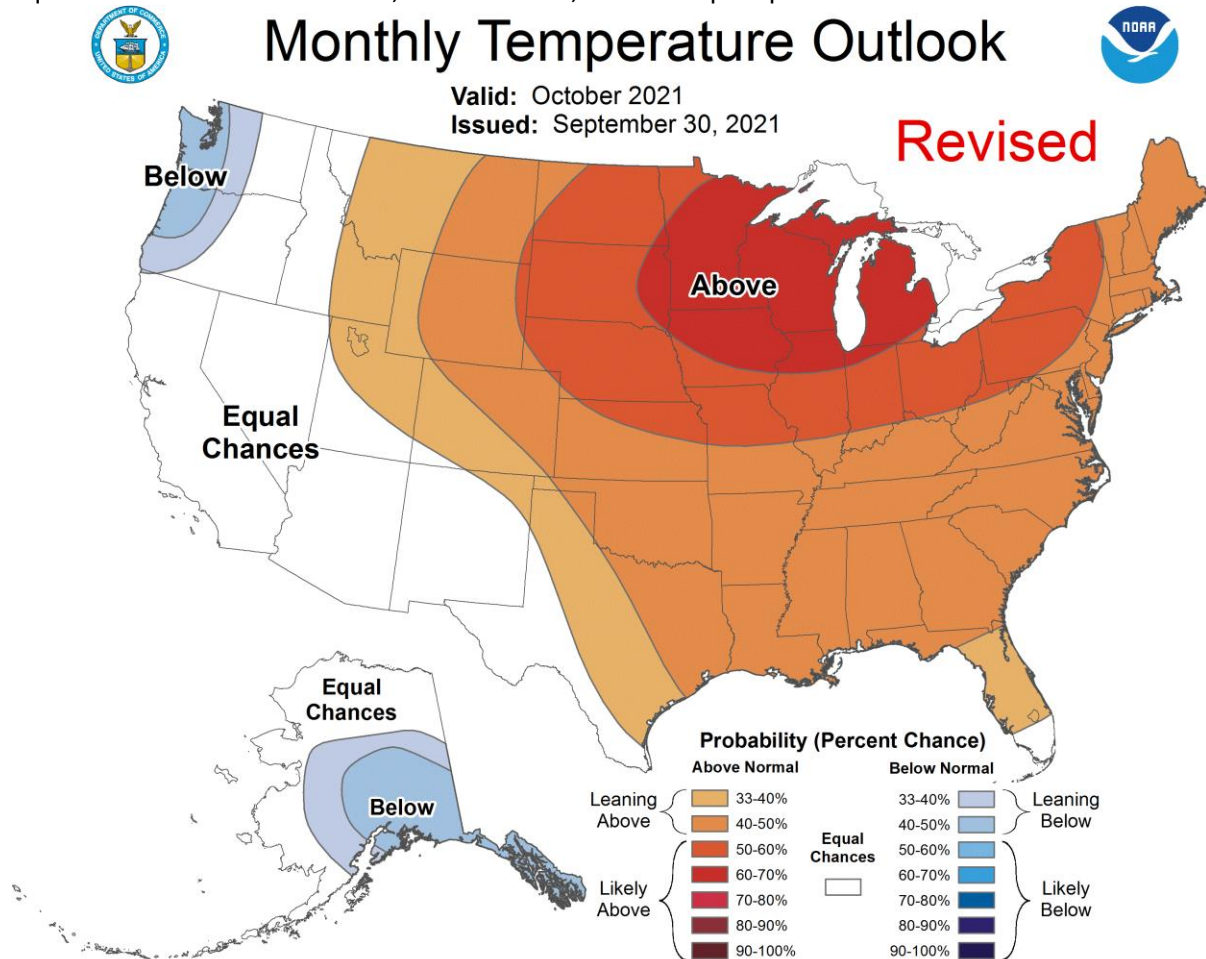
Storm Reports:

**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 severe storm damage in Tennessee for September 2021. This was the first time since 2008 that there were no severe storm reports in the month of September in Tennessee.

CPC Outlooks for the Next Month:

The NOAA Climate Prediction Center monthly outlooks for October show that all of Tennessee is leaning towards above normal temperatures (40-50% chance of above normal temperatures). West and Middle Tennessee are leaning towards above normal precipitation (33-40% chance), while East Tennessee has equal chances for above normal, below normal, or normal precipitation.





Monthly Precipitation Outlook



Valid: October 2021
Issued: September 30, 2021

Revised

