

NWS Morristown



Severe Weather Safety Guide

"Failure to prepare is preparing to fail"

-John Wooden (Former UCLA Men's Basketball Head Coach)



Table of Contents

•	Message from the Staff	Page 3
•	Awareness and Preparedness	Page 4
•	Personal Emergency Information	Page 5
•	NOAA Weather/All Hazards Radio	Page 6
•	South Plains Severe Weather Stats	Page 7
•	Thunderstorms	Page 8
•	Lightning	Page 9
•	Hail	Paae 10
•	Damaging Winds Tornado	Page 11
•	Tornado	Page 12
•	Tornado Safety Flooding	Page 13
•	Flooding	Page 14
•	Flood Safety	Page 15
•	After the Storm	Page 16
•	Our Website	Page 17
•	Severe Weather Product Guide (watches)	Page 18
•	Severe Weather Product Guide (warnings)	Page 19
•	Severe Weather Product Guide (statements)	Page 20
•	Report Severe Weather	Page 21
•	Contact Information	Page 22

A message from the staff at NWS Morristown

"Our thoughts and prayers are with all those who are continuing to recover from the historic tornado outbreaks in 2011 and 2012, and the recent flooding that occurred in mid-January. Since we are located in a region of the country that can be impacted by significant outbreaks of severe weather, we ask that you please review these safety rules so that you and your family know how to stay safe when hazardous weather threatens. It is absolutely vital that you have a plan in place to protect yourself and your family BEFORE severe weather threatens, and not be thinking about what you should have done after a storm has already impacted you!"



Awareness and Preparedness

Our region can get a wide variety of hazardous weather including thunderstorms, lightning, hail, damaging winds, and of course, tornadoes! Although severe weather can strike at anytime of the year, it is most common in our area in the spring (March-April-May) and summer (June-July-August). Though no one can prevent severe weather from occurring, we all can control our preparedness for such events. Make sure that you not only have a way to receive information of rapidly changing weather conditions, but also know what actions to take to keep you and your family or co-workers safe. Know where the best available "safe area" is located at home, work, school, or especially if you're going to be outside for an extended period of time. Make a plan with your family or co-workers and practice it often!

Construct an emergency kit with supplies that you may need in case you are impacted by severe weather, including some of the items listed on the next page. Be sure that you have any medicines that you or your family may need, a first aid kit, pet supplies, and an ample food and water supply that will sustain you for several days. Make sure you know how to turn off the electrical system at the main circuit breaker or how to shut off your gas valve.











You should always have one or more reliable ways to get accurate weather information. The official policy of the NWS is to have as many ways of receiving and exchanging information as possible. This includes having a NOAA Weather/All Hazards Radio, monitoring local television or radio, using cellular phones/text message alerts, or other local warning systems such as weather sirens.

Emergency Checklists

Emergency Preparedness Plan:

Our storm shelter is located:				
Our emergency kit is located:				
Emergency Supply Kit Checklist				
o F	Flash light			
	Medicine			
o E	Blankets			
0	Portable radio			
0	First aid kit			
0	Food/Water Supply			
O				
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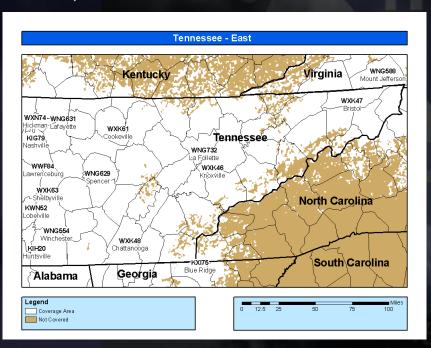
Emergency Contact Numbers

Police:			
Fire:			
Utilities:			
Gas <u>:</u>			
-			

NOAA Weather/All Hazards Radio

NOAA Weather Radio All Hazards (NWR), the voice of the National Weather Service, provides updated weather information continuously, 24 hours a day, 365 days a year. Watches, warnings, advisories, forecasts, current weather conditions, and climate data are broadcast in five to seven minute cycles on NWR stations across our area.

NWR is very useful at any time of the year and is your official source for comprehensive weather and emergency information. NWR requires a special radio receiver or scanner capable of picking up the signal. Broadcasts are found in the VHF public service band at these seven frequencies (MHz): 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550.



Map of the names and locations of all NOAA Weather Radio transmitters located in NWS Morristown domain.

For the SAME codes for your specific county you can visit:

www.weather.gov/nwr/Maps

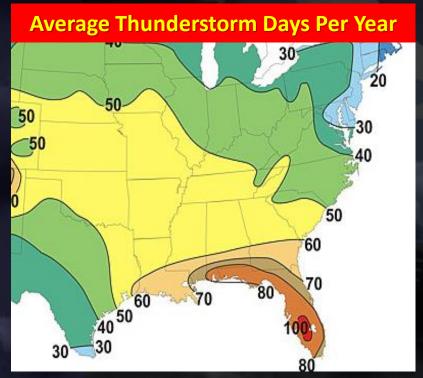


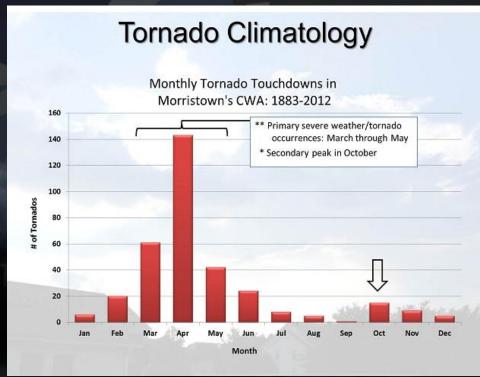
NWR is a major part of the Emergency Alert System (EAS) that disseminates critical warning information rapidly through commercial broadcast outlets. In an emergency, each NWR station will transmit a warning alarm tone signal followed by information on the emergency situation. This signal is capable of activating specially designed receivers by increasing the volume or producing a visual and/or audible alarm. Though not all weather band receivers have this capability, all weather radios can receive the emergency broadcasts.

The warning alarm device is normally tested each Wednesday between 11 AM and Noon, weather permitting!

Southern Appalachian Region Severe Weather Statistics

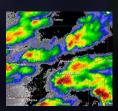
- On average, the Southern Appalachians and Tennessee Valley will experience 40-50 thunderstorm days per year, with the peak of our severe weather season occurring in the spring (March-April-May) and summer (June-July-August).
- Tornadoes are most common in our area in March, April and May though they can also be observed in the winter, summer and autumn months too.
- Tornadoes can occur at anytime time, but mostly likely to occur from the early afternoon through the late evening.





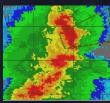
Thunderstorms

Thunderstorms pose a significant threat to residents of the Tennessee Valley each year because they are capable of producing one or more of the following significant weather threats: lightning, damaging winds, hail, flooding, and tornadoes.



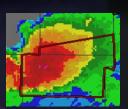
Pulse thunderstorms are usually fairly weak and may only last 30-40 minutes. The probability of severe weather is fairly low, but they are still capable of producing lightning, small hail, and gusty winds.

Pulse



Multicell

Multicell thunderstorms can become fairly strong and can last for 2-3 hours. They are certainly capable of producing multiple types of severe weather such as damaging winds, moderately large hail, weak tornadoes, and potentially significant flash flooding.



Supercell

Supercell thunderstorms are very intense and can persist for several hours. Because of their strong rotating updrafts, they pose a high risk of producing severe weather over a large area. They are capable of producing damaging winds, giant hail, strong to violent tornadoes and even flash flooding.

What is a "severe" T-storm?

- Winds in excess of 58 mph (50 kts)
- One inch diameter hail (quarter size) or larger
- Tornado



Safety Tips

- The best defense against thunderstorms is to stay inside a substantial building or shelter that will protect you from lightning, wind, hail, tornadoes, and heavy rain.
- When thunderstorms are expected, stay alert and be aware of rapidly changing weather conditions.
- For the latest up to date weather information, stay tuned to your NOAA Weather/All Hazards Radio. Recall your weather safety plan and be ready to take action!

Lightning

"When Thunder Roars, Go Indoors!"

Lightning is nature's most "underrated" killer!

- Lightning kills more people each year on average than tornadoes and hurricanes, but is often overlooked as a significant weather threat.
- Unlike other hazards, lightning does not usually kill or injure multiple people at once or cause widespread damage. This often leads people to underestimate how significant the danger really is.
- Since 1980, on average there have been 54 lightning related fatalities per year across the United States!

Safety points to remember!

- NO PLACE outside is safe when thunderstorms are in the area!
- When you hear thunder, immediately move to a safe shelter.
- A safe shelter is a substantial building or inside an enclosed, metal-topped vehicle.
- Stay in your safe shelter at least 30 minutes after you hear the last clap of thunder.

Lightning Facts

- Lightning will follow a path of least resistance to the ground, often striking the tallest object in an area.
 You DO NOT want that object to be you!
- Avoid seeking shelter under tall objects such as trees or standing next to utility poles, TV towers, or other prominent structures.
- Water is an excellent conductor of electricity, so get out of bodies of water such as pools or lakes and avoid taking a shower until the storm has passed.
- Lightning can also travel great distances, striking several miles away from the parent thunderstorm. In other words, you are close enough to be struck well before or after the other effects of a thunderstorm impact your location!





Hail

Hail is a form of solid precipitation which consists of balls or irregular chunks of ice that form within thunderstorms. It is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere (the stronger the updraft, the larger the hail size). Eventually, the hailstone will become too heavy for the updraft to support and it will fall to the surface. Large hail is most common in the southern Appalachians and Tennessee Valley in the springtime when the mid to upper-level portions of the troposphere are colder.

Fast Facts

- Large hail can be very dangerous. It can cause damage to objects, such as cars, aircraft, homes, and trees. In some cases, they can cause bodily injuries, or in rare cases deaths.
- Hail causes nearly \$1 billion in damage to property and crops annually.
- Hail may take on many different sizes and shapes, ranging from the size of a pea up to the size of a softball or DVD. In extreme cases they can be even larger.
- The National Weather Service deems hail one inch in diameter (quarter size) or larger to be severe.
- The largest hailstone fell in Vivian, SD on July 23, 2010 (shown below). It was 8" in diameter (about the size of a small volleyball) and weighed 1.93 pounds!





Courtesy of NWS Aberdeen, SD

Severe Hail Size Examples

Hail Type	Diameter (in)
Quarter	1.0"
Ping Pong Ball	1.5"
Golfball	1.75"
Lime	2.0"
Tennis Ball	2.5"
Baseball	2.75"
Tea Cup	3.0"
Grapefruit	4.0"
Softball	4.5"
DVD	5.0"

Damaging Wind Events

Image of a downburst in Texas

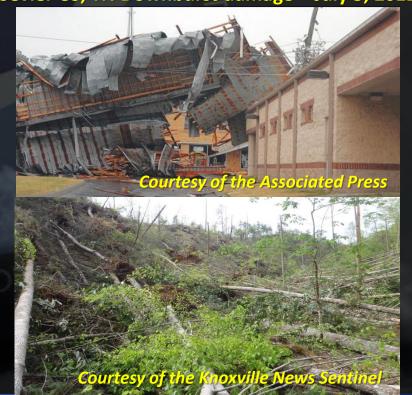
A downburst is one type of thunderstorm wind damage that typically occurs during the spring or summer months in single-cell afternoon thunderstorms. They are generated when rain-cooled, dense air sinks inside a thunderstorm. As the air impacts the ground it is forced to spread out laterally causing the gusty winds associated with thunderstorms. Unlike a tornado, winds in a downburst are directed outwards from the point it strikes the earth's surface.



- Each year across our area, damaging wind events occur fairly regularly and account for a large portion of damage caused by thunderstorms.
- These strong, straight-line winds are not associated with the rotation of a tornado, but can cause just as much damage as a weak tornado.
- Wind speeds from a thunderstorms reach speeds up to 100-120 mph, creating a large damage path that can extend for several miles.
- Trees and power lines can be knocked down, mobile homes are easily overturned or destroyed, and even well-built structures, such as homes or office buildings can be heavily damaged.



Sevier Co, TN Downburst damage – July 5, 2012



Tornadoes

A tornado is a violently rotating column of air that is attached to the base of a thunderstorm and is in contact with the ground. Although a tornado could develop within any type of thunderstorm, they are most commonly produced by supercells or rotating thunderstorms, which typically occur across the southern Appalachians and Tennessee Valley during the Spring.

Fast Facts

- Tornadoes can vary in size and shape from a few yards in diameter to over a mile wide.
- Winds in a tornado range from 60-70 mph to over 200 mph in extreme cases.
- Although tornadoes can occur anytime of the year and at any time of day, they are most common in our area from March through May.
- Since 1980, there have been 178 tornado fatalities in the state of Tennessee!

Residents of the Tennessee Valley are encouraged to be prepared when there is any potential for tornadoes to occur!

Tornadoes in Hamilton Co, TN – April 27, 2011



Tornado Fletion and Fact

FACT:

FACT:

FICTION: Lakes, rivers, and mountains protect areas from tornadoes.

FACT: No geographic location is safe from tornadoes. A tornado near Yellowstone National Park left a path of destruction up and down a 10,000 foot mountain.

FICTION: A tornado causes buildings to "explode" as the tornado passes overhead.

FACT: Violent winds and debris slamming into buildings cause the most structural damage.

FICTION: Open windows before a tornado approaches to equalize pressure and minimize damage.

Virtually all buildings leak. Leave the windows closed. Take shelter immediately. An underground shelter, basement or safe room are the safest places. If none of those options are available, go to a windowless interior room or hallway.

FICTION: Highway overpasses provide safe shelter from tornadoes.

FACT: The area under a highway overpass is very dangerous in a tornado. If you are in a vehicle, you should immediately seek shelter in a sturdy building. As a last resort, you can either: stay in the car with the seat belt on. Put your head down below the windows, covering with your hands and a blanket if possible, OR if you can safely get noticeably lower than the level of the roadway, exit your car and lie in that area, covering your head with your hands. Your choice should be driven by your specific circumstances.

FICTION: It is safe to take shelter in the bathroom, hallway, or closet of a mobile home.

Mobile homes are not safe during tornadoes! Abandon your mobile home to seek shelter in a sturdy building immediately. If you live in a mobile home, ensure you have a plan in place that identifies the closest sturdy buildings.

Tornado Safety

In your home or office

Go to a pre-determined shelter, such as a basement or storm cellar. If an underground shelter is not available, go to a small interior room, such as a closet, bathroom, or interior hallway, on the lowest level. Put as many walls between you and the tornado as possible. Stay away from windows and doors.

In Mobile Homes

 Leave well in advance of approaching severe weather and go to a strong building. If there is no shelter nearby, get into the nearest ditch, depression, or underground culvert and lie flat with your hands shielding your head.

In Vehicles

- The first option is to remain in your car and try to out run the tornado, accurately determining the path and speed of the tornado. You can pull off the road and protect yourself from flying debris and shattering glass, hoping the tornado is not strong enough to pick up your vehicle
- The second option is to abandon your vehicle and take shelter in a ditch. Take cover far enough away from your car, so it and other heavy debris does not wind up on top of you.

Protect yourself from flying debris with pillows, heavy coats, blankets, or quilts! Use a bicycle or motorcycle helmet to protect your head!





Flooding

The southern Appalachians and Tennessee Valley region is susceptible to flooding due to its proximity to the Gulf of Mexico and Atlantic Ocean which are the two major source regions of moisture for the area. When storm systems move into the region and combine with this moisture, it results in the development of showers and storms which can produce flooding. Some examples of these events include: large storm systems, decaying tropical systems or slow-moving thunderstorms, which can produce large amounts of rainfall in a short amount of time.

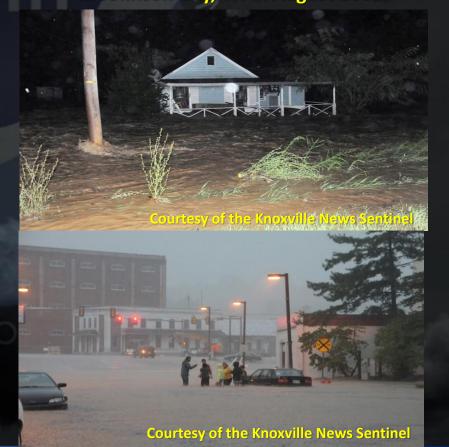
Flash Flood Fast Facts

- Flash floods often occur within minutes or hours of heavy rainfall. The rapidly rising water can destroy structures and bridges, down trees, create new waterways and trigger mudslides.
- Areas most prone to flash floods are urban areas, small streams and rivers, culverts, and storm drains.
- Urbanization increases water runoff two to six times over what would occur in natural terrain. This causes streets and parking lots to become swift moving rivers.

Major flooding along the Little River inundates a campground near Townsend in January 2013

Courtesy of the Knoxville News Sentine

Flash Flooding from a thunderstorm complex in Johnson City, TN in August 2012.



Flood Safety

"Turn Around, Don't Drown"

Flooding is the most damaging, costly, and deadly severe weather-related phenomena, costing the United States over \$5 billion in property damage annually. On average, flooding is responsible for more deaths each year than lightning or tornadoes.

 <u>A Flash Flood/Flood Watch</u> means conditions are favorable for sudden short-term (less than 6 hours) flooding or long duration (longer than 6 hours) flooding, respectively.

• <u>A Flash Flood or Areal Flood Warning</u> means flooding conditions are imminent and you should take action to

protect your life immediately!

Move to higher ground away from low-lying areas, storm drains, and stream beds.

- Flood waters carry debris that could cause serious injury or death. Water could be moving very quickly just below the surface.
- Only 6 inches of fast-moving water can knock an adult over.
 Children should not be allowed to play or walk near flowing water.

Never drive across flooded roadways or around barricades.

- Flood waters can rise very quickly, covering your vehicle or sweeping it downstream.
- Just two feet of water can move most vehicles, including trucks and large SUVs.
- Road surfaces could be washed away or large debris might be located below the surface.
- If your vehicle is caught in rising water, abandon it immediately and seek higher ground.



Be especially cautious at night, when it is harder to recognize flood dangers!

After the Storm

- Be aware of hazards from exposed nails and broken glass.
- Do not touch downed power lines or objects in contact with downed lines. Report electrical hazards to the police and the utility company.
- If it is dark when you are inspecting your home, use a flashlight rather than a candle or torch to
 avoid the risk of fire or explosion in a damaged home.
- If you see frayed wiring or sparks, or if there is an odor of something burning, you should immediately shut off the electrical system at the main circuit breaker if you have not done so already.
- If you smell gas or suspect a leak, turn off the main gas valve, open all windows, and leave the
 house immediately. Notify the gas company, the police or fire departments, or State Fire Marshal's
 office, and do not turn on the lights, light matches, smoke, or do anything that could cause a spark.
- Do not return to your house until you are told it is safe to do so!





Our Website

The NWS Morristown website (www.weather.gov/mrx) is the most complete and accurate source for weather information across the region. Here you can find up to the minute forecast information, satellite and radar imagery, climate data, aviation and fire weather forecasts, river and lake water level forecasts and information, information about recent hazardous weather events that may have impacted our area, and various ways you can contact us.



By entering your zip code on the upper left hand corner of our homepage, you can access an official seven day forecast for your specific location. The page will give you a quick pictorial view of the expected weather as well as a detailed text based forecast below. In addition links to hourly weather data, radar, and satellite imagery is provided.



that displays all current watches,

Our office webpage also has a clickable map that displays all current watches, warnings, statements, and advisories which will quickly inform you of any of the current hazardous weather that may be ongoing in your area!





We also create graphical forecast products (intuitively called Graphicasts) to help to convey the latest forecast information and help you, our costumers make informed decisions about what weather impacts to expect. Two examples are shown above.

Severe Weather Product Guide

What is a watch?

- Watches are normally are issued well in advance of the actual occurrence of severe weather such as thunderstorm, flash floods, or tornadoes and have an average duration of 4 to 8 hours.
- If you are located within a designated watch area, take the time to review the safety rules, stay informed of the latest weather conditions and be ready to take action and move to a place of safety if a warning is issued and threatening weather approaches.
- NWS Morristown will keep the public informed on what is happening in the watch area and also let them know when the watch has expired or is cancelled.

- Our office will issue a list of the counties included in each watch. See "Special Weather

Statement" on page 20.

Severe Thunderstorm Watch (from the Storm Prediction Center):

A "Severe Thunderstorm Watch" is issued when conditions are favorable for the development severe thunderstorms in and close to the watch area. This means storms are expected to produce damaging winds in excess of 58 mph and/or hail of 1" diameter or greater.

Tornado Watch (from the Storm Prediction Center):

A "Tornado Watch" is issued when conditions are favorable for the development of tornadoes and severe thunderstorms in and close to the watch area.



Tornado Watch issued on March 2, 2012.

Severe Weather Product GuideWhat is a warning?

- Warnings are issued when severe weather (severe thunderstorms, tornadoes, flash flooding, etc) is imminent or already occurring. Persons in the warning area should take immediate action to protect their lives and the lives of others!
- Warnings are much smaller than watches and specific to an individual storm or line of storms. These "Storm-Based Warnings" are issued as a "polygon" for a threatening severe or tornadic storm.
- The typical duration for a warning is usually between 30 minutes to an hour. Information provided in the warning includes the location of the storm/tornado and what communities or locations are in the path of the storm.

- After a warning has been issued, our office will follow it up periodically with Severe

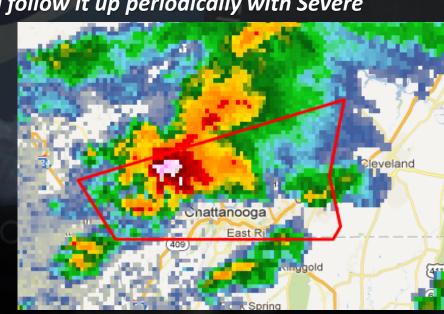
Weather Statements (see page 20).

Severe Thunderstorm Warning (SVR):

A "Severe Thunderstorm Warning" is issued when a thunderstorm exhibits characteristics of producing large hail or damaging winds in excess of 58 mph (50 kts) on radar or when a reliable report of large hail or wind damage is received. Lightning frequency is not a criteria for issuing a Severe Thunderstorm Warning!

Tornado Warning (TOR):

A "Tornado Warning" is issued when a tornado is detected on radar or a reliable report of a tornado is received.



"Storm-Based" Tornado Warning on March 2, 2012

Severe Weather Product Guide Follow-ups and Special Statements

Special Weather Statement (SPS):

A "Special Weather Statement" is issued to alert the public of hazardous weather situations that are "below" what is designated as severe. For instance, a thunderstorm that contains lightning, gusty winds to 40 mph, and dime sized hail could certainly be considered "strong" or "hazardous", but is not severe. Thus, an NWS meteorologist would issue a SPS to highlight the potential hazards of the storm without issuing a warning for an event that does not warrant one.

Severe Weather Statement (SVS):

A "Severe Weather Statement" is used to refresh or update information contained in a Severe Thunderstorm Warning or Tornado Warning. The SVS is an "extension" of a warning that includes updated information on where the thunderstorm or tornado is located and if any severe weather (hail, wind damage, etc) has been reported. Most warnings issued by the NWS have at least one Severe Weather Statement issued to follow up on them. This product is also used to cancel warnings when severe weather has moved out of the warned area.

Tornado Warning issued on March 2, 2012

BULLETIN - EAS ACTIVATION REQUESTED TORNADO WARNING NATIONAL WEATHER SERVICE MORRISTOWN TN 1049 AM CST FRI MAR 2 2012

THE NATIONAL WEATHER SERVICE IN MORRISTOWN HAS ISSUED A

- * TORNADO WARNING FOR...

 HAMILTON COUNTY IN EAST TENNESSEE...

 MARION COUNTY IN EAST TENNESSEE...
- * UNTIL 1130 AM CST/1230 PM EST/
- * AT 1045 AM CST...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A TORNADO 12 MILES WEST OF SOUTH PITTSBURG...OR 13 MILES NORTHWEST OF BRIDGEPORT. DOPPLER RADAR SHOWED THIS TORNADO MOVING NORTHEAST AT 55 MPH.
- * LOCATIONS IN THE WARNING INCLUDE...

 JASPER...SOUTH PITTSBURG...WHITWELL...ORME...HALETOWN (GUILD)...

 MARTIN SPRINGS AND POWELLS CROSSROADS.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

WHEN A TORNADO WARNING IS ISSUED BASED ON DOPPLER RADAR...IT MEANS THAT STRONG ROTATION HAS BEEN DETECTED IN THE STORM. A TORNADO MAY ALREADY BE ON THE GROUND...OR IS EXPECTED TO DEVELOP SHORTLY. IF YOU ARE IN THE PATH OF THIS DANGEROUS STORM...MOVE INDOORS AND TO THE LOWEST LEVEL OF THE BUILDING. STAY AWAY FROM WINDOWS. IF DRIVING...DO NOT SEEK SHELTER UNDER A HIGHWAY OVERPASS.

THE SAFEST PLACE TO BE DURING A TORNADO IS IN A BASEMENT. GET UNDER A WORKBENCH OR OTHER PIECE OF STURDY FURNITURE. IF NO BASEMENT IS AVAILABLE...SEEK SHELTER ON THE LOWEST FLOOR OF THE BUILDING IN AN INTERIOR HALLWAY OR ROOM SUCH AS A CLOSET. USE BLANKETS OR PILLOWS TO COVER YOUR BODY AND ALWAYS STAY AWAY FROM WINDOWS.

"Submit a Storm Report"

Reporting severe weather online

SEARCH

NEWS



FORECAST Local forecast by

"City, St" or ZIP code

Location Help

News Headlines

PAST WEATHER

Top Snowfalls Across the Tennessee Valley and Southern Appalachians

SAFETY

- SKYWARN Spotter Class REGISTRATION and Schedule
- . Submit Weather Spotter Reports to the NWS

MY FORECAST Knoxville TN





Tonight



Rain Likely Low: 57°F

change location

Spotter Weather Reports

Weather.gov > Morristown, TN > Spotter Weather Reports

Morristown, TN Weather Forecast Office

ABOUT

Rivers and Lakes

INFORMATION

EDUCATION

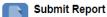
How to Report

There are a variety of ways to report weather to the NWS Morristown. You can use any of the methods below to reach us. If attaching photos of severe weather or storm damage, Facebook and Twitter are useful to easily share that information. Below the contact methods are the types of information we'd like you to report.

When you submit a storm report, please be sure to include the

- 1. Location of the weather event (e.g. 5 miles northwest of Morristown, a street address, etc)
- 2. Time of the weather event or storm damage
- 3. Indicate if you are a trained spotter, a ham radio operator, a member of law enforcement, or other affiliation if applicable

You may also view recent 24-hour local storm reports that have been issued by the NWS.





Facebook

Post information on our Facebook page: www.facebook.com/NWSMorristown

Send us a tweet: @NWSMorristown

Mobile App

Send reports from your location via a smartphone app: MPing

- Severe Weather Reports (even next day)
 - **Pictures**
 - **Damage Summaries**

Or call: (423)-586-3771

https://inws.ncep.noaa.gov/report

Contact Information

- Feel free to contact us if you have any questions:
- National Weather Service Morristown, TN Weather Forecast Office 5974 Commerce Blvd. Morristown, TN 37814 (423) 586-3771 (24 hours)
- Monday-Friday (8:00 am-4:30 pm) excluding federal holidays.



We are located off of Commerce Blvd in Morristown!