

Severe Weather



Awareness Week

Missouri Severe Weather Awareness Week 2012

March 12 - 16, 2012

Missouri Statewide Severe Weather Drill 2012: Tuesday March 13, 1:30 pm.

The National Weather Service and the State Emergency Management Agency (SEMA) have declared the week of March 12-16, 2012 as Severe Weather Awareness Week for Missouri. The goal of the week is quite simple: SAVE LIVES. The best way to do this is by being prepared. Everyone should have a basic knowledge of severe weather safety rules and have a severe weather plan in place. Knowing what actions to take when severe weather threatens can be the difference between life and death. A good time for all Missouri citizens to practice their severe weather plans will be during the Annual Missouri Severe Weather Drill, which will be held Tuesday, March 13, around 1:30 pm.

Special Note: The National Weather Service will make every effort to hold the drill on Tuesday, March 13. Clouds, rain or snow will not be enough to cancel, unless it is a major storm. However, if conditions warrant, the backup day for the drill will be Thursday, March 15, also around 1:30 pm. Everyone is encouraged to take part in the drill at the appointed time. However, if the day or time does not work, conduct a drill at a time that is best for you.

Information on severe weather safety is available from all National Weather Service offices serving Missouri. Following are public telephone numbers and Internet addresses for those offices.

St. Louis, MO http://weather.gov/stlouis	636-441-8467
Kansas City/Pleasant Hill, MO http://weather.gov/kansascity	816-540-6021
Springfield, MO http://weather.gov/springfield	417-869-4496
Paducah, K http://weather.gov/paducah	502-744-6440
Memphis, TN http://weather.gov/memphis	901-544-0399
Davenport, IA http://weather.gov/davenport	563-386-3976

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Missouri Severe Weather Statistics

Tornadoes						
	2011	2010	2009	2008	2007	2006
Total	80	64	45	93	42	102
Deaths	158	5*	3	19	3	13
Injuries	1182	19	11	232	3	273
Flash Flood/Flood						
Deaths	3	3	2	9	2	2
Injuries	0	0	0	0	4	2
Lightning						
Deaths	3	1	2	0	2	0
Injuries	6	7	1	17	5	2
Thunderstorm						
Deaths	0	0	2	0	0	3
Injuries	9	7	8	22	2	47
Combined						
Deaths	164	9	9	28	7	18
Injuries	1195	33	21	271	14	234

* There was one death that occurred in 2011 from a tornado that occurred in 2010. The death will be recorded for 2010 to match the tornado occurrence. The 102 tornadoes in Missouri in 2006 is the yearly record.

Missouri Tornadoes (1950 - 2011)

Total: 2012

Yearly Average: 32

Deaths: 388

Yearly Average: 6



Severe Weather Preparedness

Severe weather will happen, and eventually it will affect you in some way. So the only thing you can do is to try and be prepared the best you can. There are no easy answers to the many questions and problems that can arise. You have to prepare for your situation with the resources you have available.

Step 1: Identify the severe weather hazards you may face.

In the Central United States, severe thunderstorms are a fact of life. These storms can produce tornadoes, damaging wind gusts, large hail, and heavy rain that can produce flash flooding. At some point in your life, you will likely be faced with one of these hazards.

Step 2: Set up your plan.

Everyone should have a severe weather plan for their home. Likewise, businesses need to have a plan for the workplace. There will be similarities, but there will also be differences between the two. Following are some ideas that can be applied to both.

1. Establish who is responsible for the plan. Someone needs to be in charge. For a large workplace that runs several shifts, you may have several people responsible for the plan.
2. How will you receive weather warnings? NOAA Weather Radio is a great way to receive severe weather warnings from the National Weather Service. You can also get information from the commercial media, and the Internet. There are also services today that will send weather warning directly to cell phones. Do not depend solely on one method. Have multiple ways to receive critical weather information.
3. If you receive a weather warning such that you need to activate your plan, how will you inform the people you are responsible for? In a home that should not be a problem, but in a large workplace you have to have a method for communicating the severe weather information to everyone present. This is also important at large gatherings, such as sporting events or county fairs.
4. Establish shelter areas in your home or workplace. Depending on the amount of people who need to be sheltered, multiple areas may be needed. For large events, depending on time available, it is usually better to have people stay instead of rushing to their automobiles. If your home or building is in an area prone to flooding, you need to have an evacuation plan in place.

Step 3: Practice your plan!

Conduct drills and then review the drill to find strengths and weaknesses and make improvements where necessary. It is hard to foresee every circumstance, but drills can often bring out problems that were not previously seen.

Additional family protection items

- Have a family disaster plan. A plan will cover what to do, where to meet, and how to contact family members in the event of a fire or severe weather. Give emergency information to babysitters and other caregivers.
- Put together an emergency supply kit for your home, your office, and your car. A kit should have bottled water, a radio with extra batteries, a flashlight, prescription medicine and first aid supplies.
- Purchase a generator for your home or business. A generator can provide some basic electric service until the commercial power returns. A generator can also keep health equipment functioning (ventilators, oxygen, monitors) during a power outage. Remember to always follow the instructions when using a generator. For example, never use a generator in a closed structure. The engine gives off deadly carbon monoxide gas. **Always place the generator outside.**
- Make sure all family members know all possible ways to exit your home and where to meet outside the house. Keep all exits clear.
- Choose a place for your family to meet after a disaster in case you are at work or school when the disaster happens.
- Know how to contact your children at their school or daycare and where you can pick them up after a disaster. Designate a specific person to pick up your child if you cannot. Make sure the school or daycare has the most current emergency release information.
- Have a tone-alert weather radio to receive severe weather warnings. Also have a portable radio with extra batteries in case there are power outages. This allows you to get the most current weather and emergency information quickly.
- Learn first aid and CPR.
- In the event of a flood, tornado or earthquake, learn how to shut off your water, gas and electricity. Know where to find the shut-off valves and switches.
- Keep a small amount of cash on hand. ATM's will not operate if the power is out.
- Keep your gas tank full. If the power is out, gas pumps will not operate.

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Tornado Safety

Tornado! Missouri had 80 tornadoes in 2011, which is above the average of 32. The most active month was May with 36. Of course 2011 will be remembered for the Joplin tornado which directly took 158 lives and injured over 1100. We can't stop tornadoes, but by following Tornado Safety Rules, lives can be saved and injuries prevented.

Warning the public of severe weather is the National Weather Service's (NWS) most important job. To help the public prepare for tornado situations, the NWS has adopted a Watch and Warning program.

Tornado Watch: This means that conditions are favorable for tornado development. This is the time to prepare. Keep alert by listening to NOAA Weather Radio, or the commercial media for the latest weather information.

Tornado Warning: This means a tornado has been sighted or the NWS is seeing signs on radar that indicate a thunderstorm may be capable of producing a tornado at any minute. People in the path of the storm should take immediate life saving action.

In schools, hospitals, factories, shopping centers and other public places, move to designated shelter areas. Interior hallways on the lowest level are best. Stay away from windows and out of auditoriums, gymnasiums, or structures with large free span roofs.

In Vehicles: Do not try to outrun a tornado. A tornado does not have to slow down for traffic, stop signs, or curves on the road. Quickly assess your situation. If necessary, seek shelter in a nearby substantial building. If you have no alternative, abandon your vehicle and hide in a nearby ditch or depression and cover your head. Most deaths occur because of the flying debris and head injuries.

Mobile Homes: Mobile homes should be abandoned in favor of a more substantial structure if threatened by a tornado. When severe weather is approaching, move to a different location for a couple of hours and wait until the storms have passed. Mobile homes are not built to withstand the strong wind gusts that come from severe thunderstorms or tornadoes.

Tornado Myths

Myth: Areas near rivers, lakes, and mountains are safe from tornadoes.

Fact: No place is safe from tornadoes. Tornadoes can cross rivers, travel up mountains, and roar through valleys. The terrain changes in Missouri are not believed to be great enough to influence tornado formation or movement.

Myth: Low pressure with a tornado causes buildings to "explode" as the tornado passes overhead.

Fact: It is the force of the horizontal wind and debris slamming into buildings that causes structural damage during a tornado. It is not the pressure change. The air pressure will drop near a tornado. Many people near a tornado tell of their ears "popping" due to the pressure change.

Myth: Windows should be opened before a tornado to equalize pressure and minimize damage.

Fact: Opening windows allows damaging winds to enter the structure. Leave the windows alone. It is now believed that a solid structure (no windows or doors open) has a better chance of escaping major damage.

What if you are out in the open and a tornado approaches? The best thing to do is to avoid such situations. Try to get to some type of structure for shelter. If nothing is available, as a last resort, go to a low-lying area, such as a ditch, and lie flat. Try to protect your head. Hopefully the flying debris (which is the cause of most deaths and injuries) will fly over you.

What if you are driving and you see a tornado? If possible, drive away from the tornado in an opposite direction or at a 90-degree angle away from it. However, in an urban area with traffic, this will not be possible. Abandon your vehicle and go to a nearby substantial structure if you feel you cannot get away from the tornado.

There have been conflicting opinions concerning highway underpasses and tornadoes. While an underpass can offer protection from rain and hail, it may not protect you from a strong tornado. The wind from the tornado will actually accelerate as it blows through the underpass likely sweeping everything away.

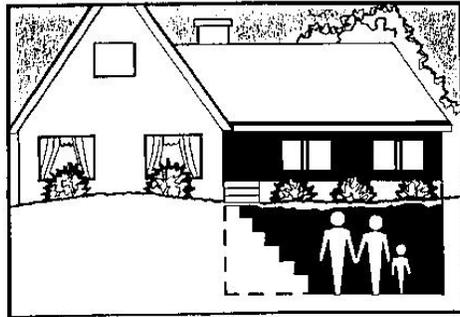
You must quickly assess your situation and decide what you should do. There is not one answer that covers all situations!

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Tornado Safety: Home and Building Safety



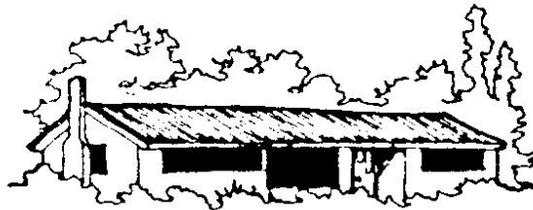
With a Basement

Basement is the safest place to go

Stay away from windows or doors

For added protection, hide under sturdy furniture, such as a workbench

A stairwell can also offer additional protection



Without a Basement

Go to the lowest level

Move to the center of the lowest level

Stay away from windows and doors

Seek an all interior, small room

Keep as many walls between yourself and the outside as you can



Multi-Level: No Basement

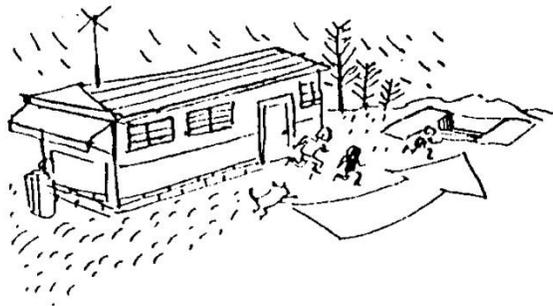
Go to the lowest level

Move to the center of the lowest level

Stay away from windows and doors

Seek an all interior, small room

Keep as many walls between yourself and the outside as you can



Mobile Home

Evacuation is a must

Move to a permanent structure or designated shelter

As a last resort, move to a low area outside, such as a ditch, or ravine

Stay low and protect your head. Allow flying debris to fly over you

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Tornado Safety in Schools

Develop a severe weather action plan and have frequent drills.

Each school should be inspected and tornado shelter areas designated. Basements offer the best protection. Schools without basements should use interior rooms and hallways on the lowest floor and stay away from windows and doors.

Those responsible for activating the plan should monitor NOAA Weather Radio (NWR) or the commercial media for the latest weather information.

If the school's alarm system relies on electricity, have a compressed air horn or megaphone to activate the alarm in case of power failure.

Make special provisions for disabled students or those in portable classrooms. Keep children at school beyond regular hours if threatening weather is expected. Children are safer at school than on busses. Bus drivers must be kept informed of the latest weather conditions while on the road.

Lunch assemblies in large rooms should be delayed if severe weather is expected. Gymnasiums, auditoriums, and often cafeterias offer little protection from tornado-strength winds.

Move students quickly into interior rooms or hallways on the lowest floor. Have them get down on their knees, bend over and cover their head with their hands.



PLAYTIME'S OVER



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Flash Flood/Flood Safety

Missouri Flood vs Tornado Deaths

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Flood	3	1	1	2	2	3	9	2	3	3
Tornado	4	19	7	0	13	4	19	3	4	158

Flash flood/flood events has been a major weather killer in Missouri for many years. Only recently, due to a number of major tornado outbreaks, has tornado deaths passed flood deaths over the past 10 years. But if you look at the table above, you will see that the flood related deaths have been very consistent, while tornado deaths tend to fluctuate quite a bit.

Many people do not realize the power of flowing water. Trees, buildings, automobiles, and people are easily swept away by flood waters.

Fact: Six inches of swiftly flowing can knock a person over.

Fact: Two feet of water will make most vehicles float.

Areas that are a major problem are **LOW WATER CROSSINGS**. As the name implies, during low water there is usually no problem. However, when the water rises, especially quickly as in a flash flood, low water crossings become **DEATH TRAPS**. Cars are easily swept downstream and often overturn, trapping the occupants inside. There is a very simple rule to follow when you encounter a flooded road in your vehicle. **Turn Around! Don't Drown!** (TADD: <http://tadd.weather.gov>)

NEVER drive into a flooded area! Be especially cautious at night when darkness will often hide flood dangers. If you live in a flood prone area, have a plan of action in case flooding strikes. Stay tuned to the latest weather developments and be ready to move quickly. Abandon personal property and move to higher ground.

Camping near small rivers is very popular, but can also be very dangerous. There were two deaths in 1997 because of people camping along a river that flooded. Remember that heavy rain upstream may lead to serious flooding at your location with little or no warning. Avoid camping along small rivers or streams when heavy rain is in the forecast anywhere in the stream basin.

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Severe Thunderstorm Safety



Thunderstorms are dangerous because they include lightning, high winds, and heavy rain that can cause flash floods. Remember, it is a severe thunderstorm that produces a tornado. By definition, a thunderstorm is a rain shower that contains lightning. A typical storm is usually 15 miles in diameter lasting an average of 30 to 60 minutes. Every thunderstorm produces lightning, which usually kills more people each year than tornadoes..

A severe thunderstorm is a thunderstorm that contains large hail, 1 inch in diameter or larger, damaging straight-line winds of 58 mph or greater (50 nautical mph), and/or a tornado. Rain cooled air (straight-line wind) descending from severe thunderstorms can move at speeds in excess of 100 mph. There were **9 injuries** from thunderstorm wind gusts in Missouri in 2011. A downburst is a sudden out-rush of this wind. Strong downbursts can produce extensive damage which is often similar to damage produced by a small tornado. A downburst can easily overturn a mobile home, tear roofs off houses and topple trees.

Severe thunderstorms can produce hail the size of a quarter (1 inch) or larger. Quarter-size hail can cause significant damage to cars, roofs, and can break windows. Softball-size hail can fall at speeds faster than 100 mph.

Thunderstorm Safety

Avoid traveling in a severe thunderstorm – either pull over or delay your travel plans.

When a severe thunderstorm threatens, follow the same safety rules you do if a tornado threatens. Go to a basement if available. If not, go to the lowest level of the building and move to a small interior room or hallway. Stay away from doors and windows.

If time permits move your vehicles into garages or carports to help prevent hail damage,

Lightning Safety

At any given moment, there are 1,800 thunderstorms in progress somewhere on Earth. This amounts to 16 million storms a year! In the United States, there are an estimated 25 million cloud-to-ground lightning flashes each year. While lightning can be fascinating to watch, it is also extremely dangerous.

According to statistics kept by the National Weather Service, the 30 year average for lightning fatalities across the country is 73. Lightning usually claims only one or two victims at a time, and because lightning does not cause mass destruction, such as from a tornado event or a hurricane, lightning generally receives much less attention than the more destructive storm-related events. Due to under reporting, it is estimated that, more realistically, about 100 - 120 deaths per year occur because of lightning. Documented lightning injuries in the United States average 300 per year; however undocumented lightning injuries are likely much higher.

Outdoors

Remember, lightning can strike up to 10 miles from the rain area. Go quickly inside a completely enclosed building before the storm arrives. A hard topped all metal-vehicle provides good protection

If no shelter is available, do not take shelter under a tree. If only isolated trees are nearby, crouch down on the balls of your feet in the open, keeping twice as far away from a tree as it is tall.

Get out of the water, off the beach, and out of small boats or canoes. Avoid standing in puddles of water even if wearing rubber boots.

Do not use metal objects such as golf clubs, metal bats, fishing rods, or metal tools.

Get off of heavy metal equipment such as tractors or construction equipment.

Indoors

Stay there! The best protection from lightning is a house or other substantial building. However, stay away from windows, doors, and metal pipes.

Do not use electric appliances during the storm. Turn off sensitive equipment such as televisions, VCR's, and computers.

Telephone use is the leading cause of indoor lightning injuries in the United States. Do not make a call unless it is an emergency.

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NOAA Weather Radio

NOAA Weather Radio is a Service of the National Oceanic and Atmospheric Administration (NOAA) of the U. S. Department of Commerce. As the "**Voice of the National Weather Service**," it provides continuous broadcasts of the latest weather information from local National Weather Service (NWS) Offices. Weather messages are repeated every 4 to 6 minutes and are routinely updated every 1 to 3 hours, or more frequently in rapidly changing local weather. Most stations operate 24 hours daily.

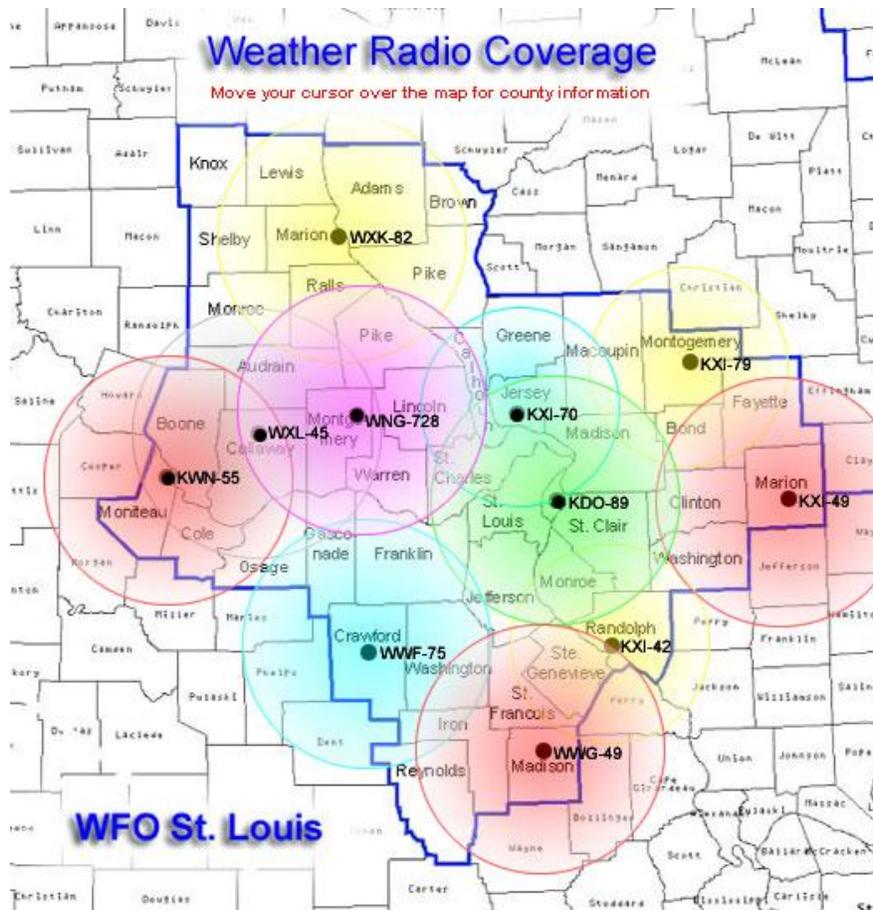
The regular broadcasts are specifically tailored to the weather information needs of the people within the service area of the transmitter. The typical coverage area of a transmitter is a 30 – 40 mile radius around the transmitter site. Other specialized information, such as hydrological forecasts and climatological data are also broadcast depending on the needs of the area covered.

A NOAA Weather Radio is currently the only device available that can warn you of impending severe weather, or of a different type disaster, 24-hours a day. During severe weather, NWS meteorologists can interrupt the routine weather broadcasts and insert special warning messages concerning imminent threats to life and property. The meteorologist can also add special signals to warnings that will trigger "alerting" features on especially equipped receivers. A NOAA Weather Radio, when set to alert mode, will turn on automatically when it receives a warning from the NWS.

National Weather Service offices will also broadcast Civil Emergency Messages at the request of local authorities. In many states, AMBER Alerts are also broadcast on NOAA Weather Radio. it is an "All Hazard" warning system.

NOAA Weather Radios are made by several manufacturers and come in a variety of types. Some also contain AM/FM receivers and can be used as clock radios. Higher end models can be set to alarm by specific area and/or a specific warning.

NOAA Weather Radio currently broadcasts from over 400 FM transmitters on seven frequencies on the VHF band, ranging from 162.400 to 162.550 mega hertz (MHz) in fifty states, Puerto Rico, the Virgin Islands, Guam, and Saipan. These frequencies are outside the normal AM or FM broadcast bands.



St. Louis, Mo - KDO-89: 162.550 Mhz

Hannibal, Mo - WXX-82: 162.475 Mhz

Fulton, Mo - WXL-45: 162.400 Mhz

Jamestown, Mo - KWN-55: 162.425 Mhz

Bourbon, Mo - WWF-75" 162.525 Mhz

Bellflower, Mo - WNG-728: 162.450 Mhz

Fredericktown, Mo - WWG-49: 162.500 Mhz

Chester, Il - KXI-42: 162.450 Mhz

Jerseyville, Il - KXI-70: 162.450

Hillsboro, Il - KXI-79: 162.425 Mhz

Salem, Il - KXI-49: 162.475 Mhz