

## Severe Weather

One of the major areas of concern in the OEM is severe weather. Whether it is a winter storm, tornado, flooding or some other weather event, the OEM has developed contingency plans. When conditions warrant, amateur radio operators who are trained weather spotters and members of RACES, deploy throughout the county to observe and report.

The best way to be alert to approaching severe weather or other hazards is through the use of a NOAA weather radio. These are available at department and electronics stores and via the internet. Weather radios can be programmed to remain silent until activated for an alert for a designated county. They can also be used to obtain routine weather forecasts and conditions issued by the National Weather Service. Information for Kalamazoo County originates from the [National Weather Service office in Grand Rapids](#) and can be received on a frequency of 162.475 MHz.

### ***WEATHER ADVISORIES, WATCHES AND WARNINGS***

The National Weather Service (NWS) issues advisories, watches and warnings to alert citizens to changing weather conditions. Precise criteria have been developed for each specific weather condition; however general definitions of each notification are provided below:

Weather Advisory When abnormal weather conditions may develop but are not expected to reach the criteria for a watch, the NWS may issue an “advisory”. If an advisory is issued for your area, you should be aware that conditions may change and be prepared to take appropriate action. Advisories are not broadcast on NOAA radio, except as part of the normal weather information.

Watch When conditions are right for the possible development of severe weather, the NWS may issue a “watch”. A watch will be for a defined time period and area and a specific weather condition. A watch does not mean severe weather is imminent, but that persons should be alert to changing conditions. Watches (except winter storm watches) are broadcast on NOAA radio preceded by an alert tone.

Warnings Severe weather “warnings” are issued by the NWS when actual severe weather is occurring; either observed by trained weather spotters or indicated by NOAA weather radar. Warnings are for a specific geographic area and for a specific time period. They are broadcast on NOAA radio preceded by an alert tone. Upon receipt of a weather warning, you should seek immediate shelter and listen to NOAA weather radio or local television for additional information.

StormReady<sup>®</sup> The City of Portage and the Ft. Custer State Recreation Area have been designated as StormReady<sup>®</sup> by the National Weather Service. You can read all about StormReady [here](#).



### **WARNING SIRENS**

There are 70 warning sirens in Kalamazoo County that may be activated to warn citizens of a potential emergency. These sirens are maintained and operated by local units of government, generally fire departments. *They are not activated by the OEM.* Different municipalities may have different criteria for activating or testing their sirens. Regardless, if you hear a warning siren, you should turn on NOAA weather radio or local television for details of what is transpiring.

Sirens are supplemental warning devices and are not intended to alert persons who are indoors, sleeping, operating noisy machinery or otherwise engaged. Weather conditions such as high winds may also limit their coverage. Not all townships in Kalamazoo County operate sirens. *Do not rely on warning sirens as your primary means of emergency or severe weather alerting.*

You can prepare for potential severe weather conditions in a variety of ways: [Make links to new pages for each weather event.]

Winter Storm Winter storms can range from a moderate snow over a few hours to a blizzard with blinding, wind-driven snow that lasts for several days. Kalamazoo County is subject to “lake effect” snow events that may create vastly different conditions only a few miles apart. Many winter storms are accompanied by dangerously low temperatures and sometimes by strong winds, icing, sleet and freezing rain.

One of the primary concerns is the winter weather's ability to knock out heat, power and communications services to your home or office, sometimes for days at a time. Heavy snowfall and extreme cold can immobilize an entire region.

The National Weather Service refers to winter storms as the “Deceptive Killers” because most deaths are indirectly related to the storm. Instead, people die in traffic accidents on

icy roads and of hypothermia from prolonged exposure to cold. It is important to be prepared for winter weather before it strikes.

### *Before a Winter Storm*

- To begin preparing, you should [build an emergency kit](#) and make a [family communications plan](#). Be sure your kit contains items for winter emergencies such as shovels, rock salt or other ice melter and adequate clothing and blankets for warmth.
- Listen to a NOAA Weather Radio or other local news channels for critical information from the National Weather Service (NWS). Be alert to changing weather conditions.
- Minimize travel. If travel is necessary, keep a disaster supplies kit in your vehicle.
- Bring pets/companion animals inside during winter weather. Move other animals or livestock to sheltered areas with non-frozen drinking water.

### *During Winter Storms*

- Stay indoors during the storm.
- Walk carefully on snowy, icy, walkways.
- Avoid overexertion when shoveling snow. Overexertion can bring on a heart attack—a major cause of death in the winter. If you must shovel snow, stretch before going outside.
- Keep dry. Change wet clothing frequently to prevent a loss of body heat. Wet clothing loses all of its insulating value and transmits heat rapidly.
- Watch for signs of frostbite. These include loss of feeling and white or pale appearance in extremities such as fingers, toes, ear lobes, and the tip of the nose. If symptoms are detected, get medical help immediately.
- Watch for signs of hypothermia. These include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. If symptoms of hypothermia are detected, get the victim to a warm location, remove wet clothing, warm the center of the body first and give warm, non-alcoholic beverages if the victim is conscious. Get medical help as soon as possible.
- Drive only if it is absolutely necessary. If you must drive: travel in the day; don't travel alone; keep others informed of your schedule; stay on main roads and avoid back road shortcuts.

- Let someone know your destination, your route, and when you expect to arrive. If your car gets stuck along the way, help can be sent along your predetermined route.
- If the pipes freeze, remove any insulation or layers of newspapers and wrap pipes in rags. Completely open all faucets and pour hot water over the pipes, starting where they were most exposed to the cold (or where the cold was most likely to penetrate).
- Maintain ventilation when using kerosene heaters to avoid build-up of toxic fumes. Refuel kerosene heaters outside and keep them at least three feet from flammable objects.
- Conserve fuel, if necessary, by keeping your residence cooler than normal. Temporarily close off heat to some rooms.
- If you will be going away during cold weather, leave the heat on in your home, set to a temperature no lower than 55°F.

#### *After Winter Storms*

- Go to a designated public shelter if your home loses power or heat during periods of extreme cold. The OEM will work cooperatively with the American Red Cross to identify and open shelters within Kalamazoo County if necessary.
- Continue to protect yourself from frostbite and hypothermia by wearing warm, loose-fitting, lightweight clothing in several layers. Stay indoors, if possible.

**Severe Thunderstorm** All thunderstorms are dangerous. Every thunderstorm produces lightning. While lightning fatalities have decreased over the past 30 years, lightning continues to be one of the top three storm-related killers in the United States. In 2010 there were 29 fatalities and 182 injuries from lightning. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms.

Other associated dangers of thunderstorms include tornadoes, strong winds, hail and flash flooding. Flash flooding is responsible for more fatalities – more than 140 annually – than any other thunderstorm-associated hazard.

#### *Before Thunderstorm and Lightning*

To prepare for a thunderstorm, you should do the following:

- To begin preparing, you should [build an emergency kit](#) and [make a family communications plan](#).
- Remove dead or rotting trees and branches that could fall and cause injury or damage during a severe thunderstorm.

- Postpone outdoor activities.
- Remember the 30/30 Lightning Safety Rule: Go indoors if, after seeing lightning, you cannot count to 30 before hearing thunder. Stay indoors for 30 minutes after hearing the last clap of thunder.
- Secure outdoor objects that could blow away or cause damage.
- Get inside a home, building, or hard top automobile (not a convertible). Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.
- Remember, rubber-soled shoes and rubber tires provide NO protection from lightning. However, the steel frame of a hard-topped vehicle provides increased protection if you are not touching metal.
- Shutter windows and secure outside doors. If shutters are not available, close window blinds, shades or curtains.
- Unplug any electronic equipment well before the storm arrives.

IF YOU ARE:	THEN:
In a forest	Seek shelter in a low area under a thick growth of small trees.
In an open area	Go to a low place such as a ravine or valley. Be alert for flash floods.
On open water	Get to land and find shelter immediately.
Anywhere you feel your hair stand on end (which indicates that lightning is about to strike)	Squat low to the ground on the balls of your feet. Place your hands over your ears and your head between your knees. Make yourself the smallest target possible and minimize your contact with the ground. DO NOT lie flat on the ground.

### *During Thunderstorms and Lightning*

If thunderstorm and lightning are occurring in your area, you should:

- Use your battery-operated NOAA Weather Radio for updates from local officials.
- Avoid contact with corded phones. Use a corded telephone only for emergencies. Cordless and cellular telephones are safe to use.

- Avoid contact with electrical equipment or cords. Unplug appliances and other electrical items such as computers and turn off air conditioners. Power surges from lightning can cause serious damage.
- Avoid contact with plumbing. Do not wash your hands, do not take a shower, do not wash dishes, and do not do laundry. Plumbing and bathroom fixtures can conduct electricity.
- Stay away from windows and doors, and stay off porches.
- Do not lie on concrete floors and do not lean against concrete walls.
- Avoid natural lightning rods such as a tall, isolated tree in an open area.
- Avoid hilltops, open fields, the beach or a boat on the water.
- Take shelter in a sturdy building. Avoid isolated sheds or other small structures in open areas.
- Avoid contact with anything metal—tractors, farm equipment, motorcycles, golf carts, golf clubs, and bicycles.
- If you are driving, try to safely exit the roadway and park. Stay in the vehicle and turn on the emergency flashers until the heavy rain ends. Avoid touching metal or other surfaces that conduct electricity in and outside the vehicle.

***After the storm passes remember to:***

- Never drive through a flooded roadway. Turn around, don't drown!
- Stay away from storm-damaged areas to keep from putting yourself at risk from the effects of severe thunderstorms.
- Continue to listen to a NOAA Weather Radio or to local radio and television stations for updated information or instructions, as access to roads or some parts of the community may be blocked.
- Help people who may require special assistance, such as infants, children and the elderly or those with access or functional needs.
- Stay away from downed power lines and report them immediately.
- Watch your animals closely. Keep them under your direct control.

Tornado Tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. Every state, including Michigan, is at some risk from this hazard. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

### *Before a Tornado*

- To begin preparing, you should [build an emergency kit](#) and make a [family communications plan](#).
- Consider constructing a *safe room*

Extreme windstorms in many parts of the country pose a serious threat to buildings and their occupants. Your residence may be built "to code" but that does not mean it can withstand winds from extreme events such as tornadoes and major hurricanes. The purpose of a safe room or a wind shelter is to provide a space where you and your family can seek refuge that provides a high level of protection. You can build a safe room in one of several places in your home.

- Your basement
- Atop a concrete slab-on-grade foundation or garage floor.
- An interior room on the first floor.

Safe rooms built below ground level provide the greatest protection, but a safe room built in a first-floor interior room also can provide the necessary protection. Below-ground safe rooms must be designed to avoid accumulating water during the heavy rains that often accompany severe windstorms.

To protect its occupants, a safe room must be built to withstand high winds and flying debris, even if the rest of the residence is severely damaged or destroyed. Consider the following when building a safe room:

Additional information about Safe Rooms is available from FEMA.

- Listen to NOAA Weather Radio or to commercial radio or television newscasts for the latest information. In any emergency, always listen to the instructions given by local emergency management officials.
- Be alert to changing weather conditions. Look for approaching storms.
- Look for the following danger signs:
  - ❖ Dark, often greenish sky
  - ❖ Large hail
  - ❖ A large, dark, low-lying cloud (particularly if rotating)
  - ❖ Loud roar, similar to a freight train.
- If you see approaching storms or any of the danger signs, be prepared to take shelter immediately.

### *During a Tornado*

If you are under a tornado warning, seek shelter immediately! Most injuries associated with high winds are from flying debris, so remember to protect your head.

IF YOU ARE IN:	THEN:
<p>A structure (e.g. residence, small building, school, nursing home, hospital, factory, shopping center, high-rise building)</p>	<ul style="list-style-type: none"> <li>• Go to a pre-designated shelter area such as a safe room, basement, storm cellar, or the lowest building level. If there is no basement, go to the center of an interior room on the lowest level (closet, interior hallway) away from corners, windows, doors, and outside walls. Put as many walls as possible between you and the outside. Get under a sturdy table and use your arms to protect your head and neck.</li> <li>• In a high-rise building, go to a small interior room or hallway on the lowest floor possible.</li> <li>• Put on sturdy shoes.</li> <li>• Do not open windows.</li> </ul>
<p>A trailer or mobile home</p>	<ul style="list-style-type: none"> <li>• Get out immediately and go to the lowest floor of a sturdy, nearby building or a storm shelter. Mobile homes, even if tied down, offer little protection from tornadoes.</li> </ul>



<p>The outside with no shelter</p>	<ul style="list-style-type: none"> <li>• Immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy shelter.</li> <li>• If your vehicle is hit by flying debris while you are driving, pull over and park.</li> <li>• Stay in the car with the seat belt on. Put your head down below the windows; cover your head with your hands and a blanket, coat or other cushion if possible.</li> <li>• If you can safely get noticeably lower than the level of the roadway, leave your car and lie in that area, covering your head with your hands</li> <li>• Do not get under an overpass or bridge. You are safer in a low, flat location.</li> <li>• Never try to outrun a tornado in urban or congested areas in a car or truck. Instead, leave the vehicle immediately for safe shelter.</li> <li>• Watch out for flying debris. Flying debris from tornadoes causes most fatalities and injuries.</li> </ul>
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### *After a Tornado*

Injury may result from the direct impact of a tornado or it may occur afterward when people walk among debris and enter damaged buildings. A recent study of injuries after a tornado showed that 50 percent of the tornado-related injuries were suffered during rescue attempts, cleanup and other post-tornado activities. Nearly a third of the injuries resulted from stepping on nails. Because tornadoes often damage power lines, gas lines or electrical systems, there is a risk of fire, electrocution or an explosion. Protecting yourself and your family requires promptly treating any injuries suffered during the storm and using extreme care to avoid further hazards.

### **Injuries**

Check for injuries. Do not attempt to move seriously injured people unless they are in immediate danger of further injury. Get medical assistance immediately. If someone has stopped breathing, begin CPR if you are trained to do so. Stop a bleeding injury by applying direct pressure to the wound. Have any puncture wound evaluated by a physician. If you are trapped, try to attract attention to your location.

### **General Safety Precautions**

Here are some safety precautions that could help you avoid injury after a tornado:

- Continue to monitor your battery-powered radio or television for emergency information.
- Be careful when entering any structure that has been damaged.
- Wear sturdy shoes or boots, long sleeves and gloves when handling or walking on or near debris.
- 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.
- Use battery-powered lanterns, if possible, rather than candles to light homes without electrical power. If you use candles, make sure they are in safe holders away from curtains, paper, wood or other flammable items. Never leave a candle burning when you are out of the room.
- Never use generators, pressure washers, grills, camp stoves or other gasoline, propane, natural gas or charcoal-burning devices inside your home, basement, garage or camper - or even outside near an open window, door or vent. Carbon monoxide (CO) - an odorless, colorless gas that can cause sudden illness and death if you breathe it - from these sources can build up in your home, garage or camper and poison the people and animals inside. Seek prompt medical attention if you suspect CO poisoning and are feeling dizzy, light-headed or nauseated.
- Hang up displaced telephone receivers that may have been knocked off by the tornado, but stay off the telephone, except to report an emergency.
- Cooperate fully with public safety officials.
- Respond to requests for volunteer assistance by police, fire fighters, emergency management and relief organizations, but do not go into damaged areas unless assistance has been requested. Your presence could hamper relief efforts and you could endanger yourself.

### **Inspecting the Damage**

After a tornado or severe wind event, staff and trained volunteers working for the OEM will be doing damage assessment in the affected areas. They will be identifiable. The purpose of this assessment is to determine the extent of damages and if state or federal disaster assistance is available.

Property owners can also do self-assessments of their properties:

- Be aware of possible structural, electrical or gas-leak hazards in your home or business. Contact your local city or county building inspectors for information on structural safety codes and standards. They may also offer suggestions on finding a qualified contractor to do work for you.
- In general, if you suspect any damage to your home or business, shut off electrical power, natural gas and propane tanks to avoid fire, electrocution or explosions.
- If it is dark when you are inspecting your property, 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, and call 9-1-1. 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.

**Flooding** Floods are one of the most common hazards in the United States, including Kalamazoo County. However not all floods are alike. Some floods develop slowly, while others such a flash floods, can develop in just a few minutes and without visible signs of rain. Additionally, floods can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states.

Flash floods can occur within a few minutes or hours of excessive rainfall, a dam failure, or a sudden release of water held by an ice jam. Flash floods often have a dangerous wall of roaring water carrying rocks, mud and other debris. Overland flooding, the most common type of flooding event typically occurs when waterways such as rivers or streams overflow their banks as a result of rainwater and cause flooding in surrounding areas. It can also occur when rainfall or snowmelt exceeds the capacity of underground pipes, or the capacity of streets and drains designed to carry flood water away from urban areas.

Be aware of flood hazards no matter where you live or work, but especially if you are in low-lying areas, near water or downstream from a dam. Even very small streams, gullies, creeks, culverts, dry streambeds or low-lying ground that appear harmless in dry weather can flood. The National Weather Service routinely posts flood advisories for several areas in Kalamazoo County that experience these conditions.

### *Before a Flood*

[Flood-hazard maps](#) have been created to show the flood risk for your community, which helps determine the type of [flood insurance coverage you will need](#) since standard homeowners insurance doesn't cover flooding. The lower the degree of risk, the lower the flood insurance premium.

To prepare for a flood, you should:

- [Build an emergency kit](#) and make a [family communications plan](#).
- Avoid building in a floodplain unless you elevate and reinforce your home.
- Elevate the furnace, water heater and electric panel in your home if you live in an area that has a high flood risk.
- Consider installing "check valves" to prevent flood water from backing up into the drains of your home.
- If feasible, construct barriers to stop floodwater from entering the building and seal walls in basements with waterproofing compounds.

### *During a Flood*

If a flood is likely in your area, you should:

- Listen to NOAA weather radio or local radio or television for information.
- Be aware that flash flooding can occur. If there is any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of stream, drainage channels, canyons and other areas known to flood suddenly. Flash floods can occur in these areas with or without typical warnings such as rain clouds or heavy rain.

If you must prepare to evacuate, you should do the following:

- Secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.
- Turn off utilities at the main switches or valves if instructed to do so. Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.

If you have to leave your home, remember these evacuation tips:

- Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely. You and the vehicle can be swept away quickly.
- Do not camp or park your vehicle along streams, rivers or creeks, particularly during threatening conditions.

### *After the Flood*

Although floodwaters may be down in some areas, many dangers still exist. Here are some things to remember in the days ahead:

- Use local alerts and warning systems to get information and expert informed advice as soon as available.
- Avoid moving water.
- Stay away from damaged areas unless your assistance has been specifically requested by police, fire, or relief organization.
- Emergency workers will be assisting people in flooded areas. You can help them by staying off the roads and out of the way.
- Play it safe. Additional flooding or flash floods can occur. Listen for local warnings and information. If your car stalls in rapidly rising waters, get out immediately and climb to higher ground.
- Return home only when authorities indicate it is safe.
- Roads may still be closed because they have been damaged or are covered by water. Barricades have been placed for your protection. If you come upon a barricade or a flooded road, go another way.
- If you must walk or drive in areas that have been flooded.
  - ❖ Stay on firm ground. Moving water only 6 inches deep can sweep you off your feet. Standing water may be electrically charged from underground or downed power lines.
  - ❖ Flooding may have caused familiar places to change. Floodwaters often erode roads and walkways. Flood debris may hide animals and broken bottles, and it's also slippery. Avoid walking or driving through it.
  - ❖ Be aware of areas where floodwaters have receded. Roads may have weakened and could collapse under the weight of a car.
- Stay out of any building if it is surrounded by floodwaters.

- Use extreme caution when entering buildings; there may be hidden damage, particularly in foundations.