

THIRTEEN THINGS YOU MUST KNOW TO SURVIVE SEVERE WEATHER EMERGENCIES

An Essential Checklist to Help You Prepare For
And Survive Episodes of Severe and Extreme
Weather

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Home Weather Stations Guide

<http://home-weather-stations-guide.com>

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CONTENTS

1. INTRODUCTION	3
1.1 Early preparation	4
1.2 Identifying the Threats	5
1.3 Shelter and Evacuation	6
1.4 Communication	7
1.5 Advanced Planning, Home Safety, and Emergency Kits	8
2. WEATHER EMERGENCY ACTION GUIDES	11
2.1 FLOODS	12
2.2 FLASH FLOODS	14
2.3 TORNADOES	16
2.4 HURRICANES	18
2.5 THUNDERSTORMS	21
2.6 LIGHTNING	24
2.7 WINTER STORMS	26
2.8 EXTREME HEAT	29
2.9 VOLCANIC ERUPTIONS	32
2.10 LANDSLIDES	34
2.12 TSUNAMIS	36
2.13 WILDFIRES	38
2.14 FOG	41
3. CONCLUSIONS	43

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1. INTRODUCTION

At some time in our lives, many of us will face an emergency. Most will relate to personal illness or injury, but of those with outside sources, some form of severe weather is the most likely cause.

This short checklist is focused on severe weather emergencies, and is based on the FEMA (Federal Emergency Management Agency of the Department of Homeland Safety) booklet titled "Are You Ready", together with some necessary additions. "Are You Ready" also contains valuable sections on what to do when faced by emergencies resulting from the release of hazardous materials or terrorism, together with advice on personal emergencies such as a household fire.

This is an excellent publication which covers everything to do with emergencies, including emergency packs for the car or home, survival kits, evacuation procedure, post emergency recovery and more. It is designed for USA citizens, but is relevant to anyone, anywhere, faced with a general emergency which threatens life or property.

"Are You Ready" is a 200+ page booklet. If you live in the USA, it is obtainable by calling 1.800.480.2520. Otherwise your local authorities who handle emergencies may have copies for distribution, or it can be downloaded, either as a whole or in chapters, from <http://www.fema.gov/areyouready>

If you live outside the US, check with your local emergency co-ordinators for similar material.

The only disadvantage of "Are You Ready" is its size - you may not have time to read it if you are under threat. This checklist summarizes the most important parts of what you need to do before and during a weather related emergency. It is divided into sections, and relevant material can be printed separately and kept in an accessible place.

I strongly recommend that you obtain and read "Are You Ready" for an overview of sensible procedure before and during all emergencies. In the meantime, I hope you never have to face a hazardous situation, but if you do, I hope this report helps you to handle it safely.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1.1 Early Preparation

One of the hardest things about preparing for emergencies is finding the time.

When I was at school many years ago we sang a song called "The Arkansas Traveler" which was about the man whose roof leaked when it rained, but who never fixed it because when it was raining it was too wet to make repairs, and when it stopped raining it didn't leak. That's not a good attitude when dealing with weather emergencies a good deal more serious than a hole in a roof.

And it is not an overstatement to say that the USA is beset by some of the wildest weather on the planet, and some of the most seasonally variable, so your chances of being threatened by a major severe weather event are quite real.

So at some stage (soon!) it will be worth setting aside an hour or so to do a little groundwork and make a few preparations for when things get nasty.

There are four big questions that need to be answered before you can regard yourself as reasonably well prepared. And any preparation is better than none.

Involve your family in all aspects of planning - the more heads the better, and it is possible that one of you may be incapacitated in a serious emergency.

So let's identify the problems, and then think about the solutions.

The Four Big Questions

1. What are the threats, and how can we minimize them?
2. If we have to leave in a hurry, where will we go and how will we get there?
3. How will the family get together or keep in contact if some are at work and others are at school?
4. What will we need to take with us if we have to evacuate, and what will we need if we lose power and water or become isolated at home?

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1.2 Identifying the Threats

This sounds pretty easy, because you know where you live, and what sort of weather to expect as the seasons change.

But let's think a little more deeply. Severe weather is often just normal weather become stronger, or bigger, or more long lasting. So things like flash floods mightn't happen very often, but it still might be worth checking where the watercourses and drains are on the routes you often take to school, or work, or the mall. And don't forget common occurrences like lightning – it's always a threat if you are out in the open and there's a thunderstorm around.

It's also worth thinking about other places you regularly visit - the beach, the lake, relatives - and even where you go on vacation. Just a few minutes thought is all it needs to get preparation under way.

But the most important place is your home. A great shortcut is to get in contact with your local emergency management office or the Red Cross to see what information they have on your area. You should be able to find relevant FEMA hazard maps, and quite a lot of other material which will be handy as you consider the other questions.

A little further on in this article you'll find sections on each of the major weather hazards that someone, somewhere, will encounter. Where appropriate, there'll be some tips on how to make yourself, your family, and your home safer during severe weather

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1.3 Shelter and Evacuation

Most severe weather emergencies don't come with much warning. Some will require you to leave your home and move to a safer area. In the worst cases, your home may be inaccessible, damaged or destroyed, which is a tragedy no-one wants to face.

Although it is never pleasant, early warning and sound planning can remove some of the stress, and will greatly minimize the chances of you or a family member facing injury or death.

The first precaution is to be well informed, and the most effective way to ensure this is to own a weather radio, preferably a portable, battery powered one. These radios are designed to broadcast watches, warnings and updates, called statements, on dangerous and hazardous events, including weather. You can find a review of the concept and service at

<http://www.home-weather-stations-guide.com/weather-radio.html>

Weather Radio is a service provided by NOAA (National Oceanic and Atmospheric Administration) and the EAS (Emergency Alert Service). Advisories of threats and hazards are broadcast over dedicated radio frequencies (to avoid interference from commercial broadcasts) and can be picked up on specially modified radios.

Depending on its type, the radio will interrupt commercial broadcasts, or otherwise activate itself, in advance of any announcements, and a warning tone will sound. Some radios can be programmed receive warnings relevant only to your area (SAME programming - Special Area Message Encoding).

Access to Weather Radio should be high on your list of priorities for emergency planning.

Evacuations can be a matter of choice or they may be almost mandatory. Hundreds of evacuations are ordered for accidents or leaks involving hazardous materials, and many more are called during floods and hurricanes. Making yourself familiar with exit routes will reduce much of the stress involved if you ever have to move out fast.

In some cases, such as tornadoes, you may have to use a nearby shelter. Again prior knowledge of its location and easiest access will be invaluable if you ever need to use it.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1.4 Communication

Emergencies do not always happen at a convenient time for us. Your family may be scattered between home, work and school when the weather becomes severely threatening, and may remain scattered for some time until things return to normal.

Work out in advance what procedures are likely to be followed - does the school have an emergency plan and shelter? How about the work place? It will help if each family member knows what to do, and what others will be doing and where they are likely to be during an emergency. Wallet sized summaries of locations and phone numbers for each family member are a great idea, and cell phones may help you to keep in touch.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

1.5 Advanced Preparation, Home Security, and Emergency Kits

The final question of what to do before and during severe weather events can be divided into three parts.

Long Term Planning

Some important things can only be done well before any emergency. The good thing about most of them is that they'll be of benefit even if no emergency arises.

Such things as making sure your house is insured - flood insurance is possible even if you live in a flood plain - and consider your peace of mind if you know that even if your house is destroyed you will be able to rebuild. While organizing your insurance, put together an inventory of your possessions.

Another easy thing to do when everything is quiet is to arrange secure storage for important documents and small valuables, preferably separate from your house. Include copies of credit and ID cards.

An untouchable supply of emergency cash will come in handy.

And how about the pets - you may be able to take small animals with you, although you may need some sort of pet carrier. Larger animals such as horses need to be considered too.

Learning how to administer CPR and general First Aid will always be a useful skill. And why not learn how to operate a fire extinguisher?

You may even consider joining one of the volunteer organizations that help in emergencies. The more familiar you are with what is likely to happen, the better you'll be able to manage it if and when it does.

Home Security

Much of this is covered in the discussion of different types of severe weather. Depending on what your main threats are, assembling a useful set of tools and equipment will make final preparations quicker and easier.

Know how and where to turn off utilities - water, gas, power - and make sure other family members know it too.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

Put together a plan about securing your home and loading valuables and essential supplies into your vehicle in case you have to leave quickly.

Emergency Kits

You can obtain plenty of information from "Are You Ready" on various types of emergency kits and disaster supplies.

Depending on your location and types of threats you may need two sorts - one if you are staying and one if you have to leave.

It is worth considering permanent kits for the car and also your workplace, but the most important ones are those you put together at home.

The first is your evacuation kit. It is likely that food and shelter will not be a problem, although their quality may not be what you're used to. Clothing and special needs - baby and infant needs, prescription and basic medical supplies - are the most important. Include extra warm clothes - heating may not be efficient. Food treats and special toys will make things easier for children. Some basic food and a couple of gallons of bottled water are always worth including just in case.

If you are likely to be isolated and unable to leave your home for a while, assemble a kit which will keep you supplied for at least three days. Assume you will have no power, heat, water or sewage.

The essentials are plenty of water - allow 1 gallon (4.5l) per person per day, of which half will be drinking water. Commercial bottled water is a good choice. Include non perishable food, preferably low salt, and don't forget a manual can opener. You'll need a battery powered radio and a flashlight, both with plenty of extra batteries, and a first aid kit.

A camp stove and gas bottles are a great addition, and you'll need some cooking gear and some matches in a water proof container. Make sure you have enough infant or special needs, plus any necessary medication. And warm clothes should be included, plus strong shoes.

Now much of this gear will be in your house anyway, but the point of this kit is that it can double for an evacuation kit, and will be ideal if your destination is somewhere other than relatives or an emergency shelter.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

And Finally.....

OK, you've made the sacrifice and put together your plans for all likely eventualities, and chances are you'll never have to use them. But things happen, and the hundred year flood may turn up next year. However, you can relax and know you've done your best to protect your family and your home.

One more thing. Include in your plans some time in a year or so to review everything, make sure everyone understands the plan, and to go through the emergency kits and replace anything that's damaged or out of date. It won't take long, and you'll be ready for anything.

2. WEATHER EMERGENCY ACTION GUIDES

Introduction

The following guides cover the most common forms of severe weather that can develop into hazardous or emergency situations. Each section starts with a short preamble covering things you can do when the situation is normal to make life easier if and when the weather becomes threatening or dangerous. This section suggests things you can do now, when there is no time pressure. At the least, they will give you some peace of mind and allow you to concentrate on the more urgent matters if an emergency situation develops.

The second section includes lists of what to do when severe weather threatens – both immediately before it arrives, and at the time of the crisis. This section is restricted to a single page, and is necessarily brief. It is designed to be copied and kept in a handy place until needed. You may find it useful to change it or add to it to fit your situation better.

2.1 FLOODS

ADVANCE PREPARATION

- Well in advance, arrange flood insurance. It is possible even for houses in a known floodplain. Put together an inventory of your belongings. Arrange secure storage, away from your home, for valuables and essential documents. Include copies of credit and ID cards
- Check flood maps for your area. Work out the flood heights at which water will cut you off, and also the height at which it will enter your home. Determine what sort of flood is likely to affect you - will it originate with local rainfall or is it more likely to be a flood peak moving down your local river. This will be a guide to how quickly the water will rise.
- Put together an emergency kit in case you need to evacuate.

ACTION GUIDE FOR RIVER FLOODS

WHEN FLOODING IS IMMINENT

- Listen for Watches or Warnings on Weather Radio or normal radio or TV.
- A watch means flooding is only a possibility. There is no need to do anything at this stage, apart from reviewing your plans for action if the situation grows worse, unless ...
- You live close to a drain or watercourse prone to flash flooding. In this case, organize your disaster kit and valuables so you can grab them and move with minimal delay. See section of flash flooding.
- A flood warning means flooding is occurring or will occur soon. Be prepared to evacuate if advised. Remember that predicted flood heights are only valid if the situation doesn't worsen. Heavy rain in your vicinity could result in further rises.
- Start moving belongings to higher levels in your house - to a higher floor or even into the roof. Secure outdoor furniture. Turn off utilities if instructed. Disconnect appliances. Prepare to evacuate if advised. Don't leave it too late.

DURING A FLOOD

- Remember evacuation is better than rescue, and rescue is better than drowning. If in doubt, and it is safe to do so, secure your house and leave.
- Whether leaving or returning, be wary if water is over the road. Go round if possible. [Six inches (15cm) of water is enough to stall some vehicles, or make them hard to control. One foot (30cm) of water will float most cars, and two feet (60cm) of moving water will wash most vehicles away.
- Monitor the situation from radio or internet reports. If your flood involves a river system, you can check river heights and predictions at the Hydrologic Information Center website <http://www.nws.noaa.gov/oh/hic> Just click on the map for information on your area.
- Return home when advised or when it is safe to do so. Beware of water over road, which may conceal washouts.

2.2 FLASH FLOODS

Of the various types of severe weather, floods are the cause of the highest number of fatalities. Most of these deaths are caused by flash floods, most frequently as a result of people being washed away in motor vehicles.

Flash floods can develop very quickly, and may result from rain well outside the area in which the flooding occurs. Thunderstorms are the most common cause.

Less common causes are dam failures, including ice or debris dams. For more information check out

<http://www.home-weather-stations-guide.com/flash-floods.html>

ADVANCE PREPARATION

- Find out the location of watercourses and drains near your home and on the roads you regularly drive, and check with your local emergency management office for maps of flash flood prone areas.
- Identify where high rainfall may cause flash floods in your area. In many cases rain in the far away hills can cause serious flooding on the plains many miles away, without any warning and without a drop of local rain.
- Flash flooding has two parts to it - the rapid unexpected movement of water down watercourses, and the build up of water in low lying areas where it can't get away quickly enough. Find out where these areas are - they are not a good place to park your car, and present their own hazards to driving.
- Try to identify a flood free route for when you may need to move in a hurry
- Have a small emergency kit handy to take with you if you need to evacuate.

ACTION GUIDE FOR FLASH FLOODS

WHEN FLASH FLOODING IS LIKELY

- Watch the skies in the direction from where heavy rainfall may generate floodwaters affecting your area.
- Listen to Weather Radio. Because flash floods can occur very quickly only warnings are given - there are no flash flood watches.
- Trust your judgment. Even emergency radio warnings are slightly delayed. If you think a flood is likely don't wait for radio confirmation.

DURING A FLASH FLOOD

- If you are home and at risk, leave immediately. Leave on foot for higher ground if possible, unless you are certain there is a safe route for your car.
- Be very careful of flowing water. Even six inches (15cm) of fast moving water can sweep you off your feet, and flowing water may conceal holes and washouts. If at all possible go back and round. Otherwise, if you are safe, wait.
- Six inches (15cm) of water is enough to stall some vehicles, or make them hard to control. One foot (30cm) of water will float most cars, and two feet (60cm) of moving water will wash most vehicles away.
- When returning, be careful of washouts concealed by water over the road

2.3 TORNADOES

Tornadoes can occur in all states, at any time of year and any time of day.

They are most common on the central plains, extending into southern Canada, with pockets in the eastern states.

The peak season is March through May in the south, extending into late spring and summer in the north. Peak times are between 3pm and 9pm

Tornadoes frequently occur on the trailing edge of large thunderstorms. The funnel is defined by dust and debris from ground to cloud when it is fully developed, but in early stages it may be identified by a small funnel at the base of a cloud and a dust cloud on the ground. Despite poor visual definition at this stage, extremely strong winds are still present.

For more information visit

<http://www.home-weather-stations-guide.com/tornadoes.html>

ADVANCE PREPARATION

Know what the risk of tornadoes is in your area, and when they are most likely to occur.

Find out where community tornado shelters are - you may need them if you are away from home, or if you live in a mobile home or trailer park.

Consider modifying part of your house into a tornado safe area. This could be in the cellar, or in a small internal room (away from outside walls) on the lowest floor of your house, such as a bathroom. You can gain considerable protection by strengthening the walls, supports and the ceiling.

Otherwise identify the safest room in your house for shelter using the directions above. Crouching under a sturdy table gives added protection - have one available to take with you to your safe room if necessary.

ACTION GUIDE FOR TORNADOES

WHEN A TORNADO IS IMMINENT

Keep up with Weather Radio reports. A Tornado Watch means tornadoes are possible. Keep listening and watch the sky. A Tornado Warning means a tornado has been seen or identified from radar. Take shelter immediately

If you are away from home or driving, head for the nearest shelter or substantial building. Do the same if you live in a mobile home or trailer. Do not try to outrun a tornado in your car in urban or congested areas

Remember the main danger in a tornado is flying debris.

DURING A TORNADO

Look for shelter

In your home or a building, go to a storm shelter or an internal room on the lowest floor - a bathroom or closet perhaps. Crouch under a sturdy table or other piece of furniture and protect your head with your arms.

In a car drive to the nearest suitable building that can act as a strong shelter.

If you are caught in the open look for low ground - a ditch or an excavation. Lie down and cover your head. Despite what you may have seen on TV, avoid bridges and overpasses.

2.4 HURRICANES

Hurricanes are large, extremely powerful storms which are generated in tropical seas, but may affect areas well into the higher latitudes. They are characterized by heavy rainfall, destructive winds which may exceed 155mph (240kph), storm surges many feet higher than normal tides and thunderstorms with tornadoes and downbursts.

Heavy rain may cause regional or flash flooding, and mudslides in hilly areas

In other parts of the world they are called typhoons or cyclones.

The main risk in the US is to the Gulf Coast and the Atlantic Coast between Florida and the Carolinas, although they may continue further to the north.

The hurricane season starts on June 1st, with a peak in August/September

For more information, visit

<http://www.home-weather-stations-guide.com/hurricanes.html>

ADVANCE PREPARATION

- Check insurance, keep an up-to-date inventory of your possessions, and store important documents in a safe place away from your home.
- Find out if you are likely to be affected by storm surges or flooding during a hurricane. Strong, often destructive winds are a certainty if you live near the shoreline and are in a hurricane's path.
- If you are in such a high risk zone, be prepared to evacuate when advised.
- Familiarize yourself with evacuation routes.
- Prepare to secure your house. Strong winds are most likely to cause damage by breaking windows and lifting roofs. Storm shutters or protective panels for windows are the best bet – taping windows is virtually useless. Consider roof strapping or extra clips.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

- Keep gutters clear, and garden trees and shrubs trimmed.
- If you are away from the main danger zone at the shoreline and are unlikely to be evacuated, consider building a safe room. This basically means reinforcing a small internal room on the lowest floor, such as a bathroom. See also section on tornadoes.
- Prepare one or more emergency kits - one for evacuation, another to support you if you stay, when power and water may be cut.

HURRICANE ACTION GUIDE

WHEN A HURRICANE IS LIKELY

- Listen out for hurricane watches, warnings and special bulletins on Weather Radio, normal radio and TV. A Watch (which also covers slightly less severe tropical storms which can develop into hurricanes) means hurricane conditions are possible in the next 36 hours. Check for updates on radio, TV, internet.
- A Hurricane Warning means a hurricane is expected within 24 hours.
- Put up storm shutters and secure firmly.
- Secure all outdoor and garden furniture - store in an enclosed area.
- Evacuate if advised, or if you are threatened by flooding or storm surges, if you live in a mobile home or high rise, or if you feel unsafe. Leave as soon as you can. Turn off power, gas and water if advised.
- If you are staying, assume power and water may be cut. Fill bathtub and other containers with water, turn refrigerator to coldest setting and keep door closed, turn off propane gas.

DURING A HURRICANE

- Stay inside. The main dangers are flying debris and downed power lines.
- Secure all doors and windows, close off windows with curtains or blinds, close all internal doors.
- At the peak of the hurricane, go to safe room on lower floor - lie or crouch under a sturdy table or other piece of strong furniture.
- Stay informed with weather radio, and stay inside until the hurricane has passed.

2.5 THUNDERSTORMS

Thunderstorms can occur anywhere, at any time, and most of them are relatively harmless - except for lightning – see the Lightning section.

They are most common on warm spring or summer afternoons, and Florida, the Midwest and the Atlantic and Gulf States get more than elsewhere.

About 10% of thunderstorms are classed as severe - these dangerous storms will be accompanied by one or more of tornadoes, hail larger than 3/4 inch (about 2cm), or winds stronger than 58mph (93kph).

Severe thunderstorms can be predicted from prevailing or likely weather conditions, and identified from on the ground observation or by their characteristic appearance on radar. Watches and warnings are given as part of the Weather Radio advisories. Warnings are not given for normal thunderstorms.

Apart from tornadoes, hail and strong straight line winds, sometimes called downbursts, microbursts and derechos, thunderstorms are also the cause of much flash flooding, and of course lightning. These last two are each responsible for more fatalities than the more spectacular tornadoes. You can find out more about thunderstorms at <http://www.home-weather-stations-guide.com/thunderstorms.html>

Tornadoes, lightning and flash floods each have their own section in this report, so let's have a brief glance at the other joys thunderstorms can bring - hail and strong straight line winds.

Hail can reach grapefruit or softball size, and baseball or tennis ball sized hail is not uncommon. Hailstones of this size can be lethal and are capable of penetrating car windscreens and all but the strongest forms of roofing.

Even small hail in abundance can cause problems with driving, while its weight on flat roofs can cause them to collapse.

Strong downbursts or microbursts can be just as destructive as tornadoes, but harder to see. They are local outbreaks of destructive winds.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

On a more regional scale are the strong winds which can sweep across many states as they are renewed and reinforced in long-lived lines of thunderstorms. They are called derechos, and apart from their destructive power and the dangers they present to people in unsheltered areas, they are also capable of downing power lines over considerable distances.

ADVANCE PREPARATION

There is not much you can do in advance to protect yourself and your property from these sudden and violent components of a thunderstorm, except to give them the same respect as tornadoes. Good insurance cover is advisable, and a home emergency kit will help reduce the problems caused by long power outages if a derecho has brought down several miles of power lines.

THUNDERSTORMS ACTION GUIDE

WHEN SEVERE THUNDERSTORMS ARE IMMINENT

- Listen out for warnings on the Weather Radio system, and keep an eye on the sky. Severe storms can develop very quickly and may arrive before the warnings, although this is rare.
- A severe thunderstorm watch means severe thunderstorms are likely. Watch the sky, and listen for warnings on radio and TV. It's a good time to secure outdoor furniture, and get your car under cover.
- A severe thunderstorm warning means a severe weather has been recorded by spotters or identified on radar. There is imminent danger to life and property to those in the storm's path.
- If you are in your car or in the open, try to find cover. Don't attempt to outrun the storm in your car if you are on urban or congested roads. Don't forget about safety from lightning if you are in the open.
- Locate your emergency kit before you lose power

DURING A SEVERE THUNDERSTORM

- Seek shelter if you are in the open. The dangers are large hailstones or flying debris. Look for a low spot or excavation, lie or squat down and cover your head. Be wary of water and flooding, although this is more likely after the wind or hail.
- If you are inside, go to a safe room, as you would for a tornado or hurricane. A small internal room on the lowest floor, such as a bathroom, is best.
- After the storm, watch out for downed trees and power lines, flash floods, and hail covered roads, which can be very slippery.

2.6 LIGHTNING

On average, 80 people are killed by lightning in the US each year - of severe weather related causes only floods are more deadly.

Even more people are injured, and these injuries can be long lasting and life changing. Part of the problem is that lightning can start before the storm arrives, and continue after it has passed - just the times when people are most likely to be away from shelter.

Lightning can strike ten miles (16km) or more in advance of a thunderstorm. So a good rule is that if you can hear thunder, you should start making your way towards safety.

Lightning is always associated with thunderstorms, and for more information see the section on thunderstorms, and visit <http://www.home-weather-stations-guide.com/lightning.html>

ADVANCE PREPARATION

Lightning strikes are somewhat like an Act of God, and there's not much you can do to prepare for it (the lightning, I mean).

You can install a lightning conductor on your house or business, but this doesn't prevent lightning strikes - if anything it increases the chances of a strike by providing a higher point. What it does do if hit is divert the charge away from the inside of your house into the ground, minimizing damage to the wiring, appliances, computers, weather stations etc.

If you are likely to be outside at the time thunderstorms develop, and particularly if you are responsible for others - work crews, sports teams, or groups of kids - it is well worth considering buying a lightning detector. In some conditions storm build-ups may be hard to see, and wind and other noise may make thunder hard to hear. Early warning would greatly reduce the many deaths and injuries from strikes on people trying to finish work or children trying to complete a game before the rain arrives.

More information on lightning detectors can be found at <http://www.home-weather-stations-guide.com/lightning-detectors.html>

LIGHTNING ACTION GUIDE

WHEN LIGHTNING IS CLOSE

- Take notice of a lightning detector if you have one
- Keep an eye on the sky, and listen for thunder.
- A guide to lightning safety is the 30/30 rule; if you start counting when you see a lightning flash and hear the thunder before you've reached 30, it's time to seek safe shelter. And wait 30 minutes after the last loud thunder before you leave it.
- The best protection is a fully enclosed building – not an open shed or shelter. Next best is a hard topped car with the windows up.
- If you are in the open, a group of thick small trees is safer than under a tall tree, an isolated tall structure such as a water tank, or an open space.

WHEN LIGHTNING STRIKES

- If you are inside, do not touch plumbing, electrical appliances, or use a corded (landline) telephone. Mobiles or portable phones are OK. Stay away from windows.
- If you are in the open with no shelter, crouch with your hands over your ears. Look for a low point, but not one where the ground is wet.
- If someone is struck, give first aid as soon as you can. They are not "live" - you won't get a shock by touching them. Give CPR or EAR (mouth to mouth) if necessary and call 911 or otherwise get medical attention, even if they claim to feel fine.

2.7 WINTER STORMS

Winter storms in North America have two main sources. One group forms in the Pacific, dumps rain and snow over the Pacific Coast and ranges, then reforms to charge through mid continental areas to exit into the Atlantic. These storms have several preferred tracks, which have led to names like Alberta Clipper, Colorado Low, and Panhandle Hook among others. Their paths are often determined by the location of the polar jetstream.

The second group affects the Atlantic Coast and includes the storms known as Nor'easters. They may form in the Gulf or western Atlantic and can track either side of the Appalachians.

Both groups can be affected by blocking areas of high pressure, which slow them down, while interactions between the two groups, or occasionally with decaying Atlantic hurricanes or extra tropical lows, can have spectacular and dangerous results.

For more information about winter storms see <http://www.home-weather-stations-guide.com/winter-weather.html>

Winter storms can result in heavy snowfall and blizzards, freezing rain grading to ice storms when systems stall, heavy rain, flooding and mudslides in saturated, hilly country.

Very cold conditions can develop, although the most intense cold normally comes between storms. Floods may follow them as snow and ice melt, although this may be delayed until the spring thaw.

All parts of the US are affected by winter storms to some degree, but their effects are strongest in the north and northeast, as well as California.

The main dangers are in strong winds, especially on the East coast, where storm surges may also affect coastal areas. Isolation and cold due to heavy snowfalls can affect both households and stranded car travelers, while loss of power in Ice Storms when power lines can break or pylons fail under heavy loads of ice can result in hypothermia and death. Less widespread but just as distressing are road accidents due to ice and poor visibility.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

ADVANCE PREPARATION

Unlike tornadoes and hurricanes, which occur erratically, several to many winter storms can be expected in most areas each year. Most communities will be prepared for their share of storms, and it is usually only the most severe storms that cause serious problems.

Preparation is therefore fairly routine and is centered on winterizing homes and cars. There is plenty of information about how to handle both tasks, but the basics are fairly simple.

Winterizing the home usually consists of various jobs to maximize insulation, reduce drafts, and may include putting up storm shutters. Adequate supplies of salt or sand to reduce slipping on icy drives and paths should be laid in, together with effective snow shovels. Keep in mind that a surprisingly large proportion of winter deaths come from heart attacks from over exertion shoveling snow, so don't push yourself too far.

Preparing the car for winter usually involves replacing worn or old parts, changing oils and radiator fluids to prevent freezing, checking the exhaust system, and organizing snow tires or chains as appropriate.

And most importantly, make sure you have adequate supplies to keep your and your family warm, fed and hydrated if you lose power for long periods or become isolated by heavy snowfalls. A thoughtfully prepared emergency kit will be very helpful in these conditions

WINTER STORM ACTION GUIDE

WHEN A STORM IS IMMINENT

- The best place to be is home. Try to give yourself plenty of time to return there before the storm if you are at work, school or otherwise away from home.
- The main strategy here is to be prepared to sit tight and wait it out. Listen to Weather Radio and normal radio and TV. Three main types of alerts are given.
- Winter Storm Watch - winter storm possible - check Weather Radio, radio, TV.
- Winter Storm Warning - winter storm is occurring or is about to occur.
- Blizzard Warning - Winds over 35mph or sustained and frequent gusts , with large amounts of falling or blowing snow and visibility cut to less than 1/4 mile, expected to last for 3 hours or more. Less urgent warnings may also be given about frost and freezing conditions, fogs and flooding.

DURING A WINTER STORM

- Dress with multiple layers, outer layer tightly woven & water repellent. Wear mittens, hat and cover mouth with scarf.
- Try to stay indoors. Restrict driving to main roads during daylight.
- Keep up with radio warnings and progress reports. Assume long period of isolation or power outage and conserve heat and fuel.
- Eat and drink regularly, maintain ventilation if using combustion heaters, particularly if there is no flue. Beware of fire from heaters.
- Watch for frostbite and hypothermia. Get medical attention if possible. Try to warm victim from core outward - warm non-alcoholic beverages if conscious. Don't over exert with snow shoveling.
- If caught in blizzard in a car, stay in car unless you are certain you can reach shelter on foot. Run engine and heater for ten minutes every hour. Maintain some ventilation in car when engine running to clear any carbon monoxide. Conserve battery. Keep exhaust pipe clear, hang distress flag from roof or antenna. Huddle to stay warm, one person to be awake at all times in case rescue arrives. Moderate exercise to maintain body heat, keep up fluid intake.

2.8 EXTREME HEAT

Extreme heat is probably the major cause of weather related fatalities, although reliable statistics are hard to find. This is because many deaths occur after the heat wave is over, but the final illness had its cause in excessive heat and humidity. Deaths like these are often of people with pre-existing illnesses, who would have survived for much longer if they hadn't been put under stress by the heat.

Those affected are the very young and those exerting themselves under hot conditions, where dehydration and overheating are the problems, and the frail aged and those in poor health.

Cities are the worst places for heat related illnesses and deaths, particularly those in the north of the USA and Europe. Apart from the general problems with poor air circulation typical of inner city areas, many buildings are designed to save and retain heat in cold winters. These buildings are very good at radiating heat during the day, and retaining it at night - not an ideal situation in a heat wave. Without effective air conditioning, many inner city residences are just not designed to provide cooler air through good ventilation.

Let's look quickly at a few definitions.

A Heat Wave is a prolonged period of excessive heat, often with high humidity.

High humidity reduces the effectiveness of the body's ability to cool itself, achieved mostly through perspiration and respiration. On hot days, high humidity makes it feel hotter than the temperature shown by the thermometer, and much more uncomfortable.

The Heat Index is a formula which measures this effect. For more information on this and other aspects of extreme heat visit <http://www.home-weather-stations-guide.com/heat-waves.html>

During heat waves the following alerts are broadcast by Weather Radio and other radio and TV stations.

Heat Advisories - issued when the Heat Index is expected to reach between 100 and 114F, or 38-46C - heat will be an inconvenience to most and a problem to some. Remember that this is not the measured temperature, but the apparent temperature taking into account the humidity.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

Excessive Heat Warnings – Heat Index over 115F (46C) - conditions will be dangerous for most of the population.

Warnings will also take into account the amount of cooling at night. Conditions can remain dangerous if the Heat Index remains above the mid 80s.

ADVANCE PREPARATION

There is not a lot that can be done, apart from making sure that fans and air conditioning are in good order before the very hot days arrive.

HEAT WAVE ACTION GUIDE

WHEN A HEAT WAVE IS IMMINENT, OR BUILDING UP

Stay inside as much as possible. Initially keep windows and doors closed and curtains and blinds drawn - for a while this will keep your home cooler than the outside. If you don't have air conditioning, once inside temperature reaches the outside temperature, provide as much ventilation as possible by opening doors and windows on the shady side. Consider visiting air conditioned buildings such as malls during the hottest parts of the day.

DURING A HEATWAVE

- Stay inside, use air conditioning and fans as much as possible. Wipe yourself down with a damp cloth.
- Drink plenty of water
- Give up exercise such as running or bike riding until conditions return to normal. If you have to work outside, drink plenty of water, take frequent breaks to cool off, and watch for danger signs of heat exhaustion - see below.
- Wear light clothes that keep the sun off.

The first sign of health problems may be **heat cramps** - muscular spasms due to heavy exertion, generally felt in the legs or abdomen, and often accompanied by heavy sweating. Treatment - move to cool location, stretch and massage affected muscles. Give half a glass of cool water every 15 minutes, sipped, discontinue if nauseous. No alcohol or caffeine.

Heat exhaustion - mild shock caused by over exertion and/or loss of fluids. Symptoms - Heavy sweating, possible nausea, vomiting, dizziness, exhaustion, headaches. Treatment - Move to cool place, use AC or fan, loosen or remove clothing, apply wet cloths, drinks as above. Seek medical attention if vomiting. May progress to;

Heat stroke - life threatening - body's temperature control breaks down - overheating of core and brain which leads to brain damage and death. Symptoms - high to very high body temperature, skin red and hot, rapid weak pulse, rapid shallow breathing, possible unconsciousness. Treatment - This is an emergency - call 911 or get to hospital. Massive action is needed to cool patient down - baths, fans, AC, damp cloths – watch closely.

2.9 VOLCANIC ERUPTIONS

What, I hear you asking, are volcanoes doing in an article about weather hazards.

Fair question. They are obviously not a weather phenomenon, but the products of explosive volcanic eruptions will be carried by the wind, and if you are in a downwind position you may experience a few moments of apprehension. So let's just take a quick look and then move on.

In North America volcanoes are not a major threat. For a start, there are not many of them, and those which are regarded as active or dormant are restricted to the western mountain areas. In the US, this includes Wyoming, New Mexico, and the mountainous areas to the west, plus Alaska and Hawaii.

Volcanic eruptions are of two major types. They may be lava flows, or explosive ash cloud eruptions. The second group is the most dangerous. All eruptions can be accompanied by earthquakes, landslides, mud flows, extensive ash falls, and if offshore, tsunamis.

Eruptions are usually preceded by quite long periods of seismic activity, including earthquakes and slow bulges and changes in the shape of the surface in nearby areas. So there is plenty of warning of an impending eruption, although predicting the timing accurately is much more difficult. So it is possible to be in the wrong place when a volcano erupts, and there probably will be communities affected by ash clouds.

ADVANCE PREPARATION.

There's not a lot you can do, other than be prepared to evacuate if advised. Have an emergency kit prepared once a volcano shows signs of an impending eruption, and be prepared to move quickly if a large, explosive eruption occurs. Be familiar with your potential escape routes.

Hot ash clouds racing down slope are fast and effective killers. They are unlikely, but volcanoes like Mount St Helens are capable of producing them.

VOLCANO ACTION GUIDE

WHEN AN ERUPTION IS IMMINENT

- Listen to the Weather Radio - volcano warnings are given as part of the emergency notifications.
- If you are near the summit or crater, leave immediately.
- If you live nearby, be prepared to leave promptly if advised, or if you are worried.

DURING AN ERUPTION

- Move to a safe distance. If affected by ash or gases, cover your nose and mouth with a cloth. Avoid low lying areas.
- If you live downwind from an explosive eruption you will be affected by the ash cloud. Take notice of Weather Radio warnings, and leave if advised
- Otherwise, stay inside, close windows and doors, but maintain ventilation if you are using heaters.
- If you go outside, use a dust mask, and wear long sleeved shirts, full length trousers and a hat.
- Keep an eye on the thickness of ash deposits - you may need to clear your roof to prevent collapse.
- Drive as little as possible, unless evacuating. Ash is not good for vehicle engines.

2.10 LANDSLIDES

Landslides have many causes, and are not always predictable, particularly in regard to their timing. Surprisingly, they are responsible for 25-50 deaths each year in the US.

A common form is the mudflow or debris flow that develops when unstable slopes become saturated after continuous heavy rain. So there is a definite weather connection.

Slopes are often steep but they don't have to be - even gentle slopes can fail if their composition and degree of water saturation are right.

ADVANCE PREPARATION

Check with your local authorities on landslide risk in your area. If necessary, take out insurance, and store valuable documents and possessions off site.

Arrange an assessment of landslide risk to your property and take appropriate remedial action if possible.

Be observant - look for any changes in the land surface, listen for any unusual sounds - rock falls, trees falling or splitting, and take note of doors or windows which suddenly start sticking, or cracks which appear in walls. Seek advice quickly.

If you are at risk, prepare an emergency kit in case you need to evacuate. If you do have to leave, you are unlikely to have much warning.

LANDSLIDE ACTION PLAN

IF A LANDSLIDE IS IMMINENT

- The Weather Radio system doesn't have a specific warning for landslides or mudflows, but warnings will be given when necessary.
- If you are warned, or worried, there is only one course of action, and that is to move quickly to safety. Avoid watercourses and low lying areas.

DURING A LANDSLIDE

- Move as quickly as possible out of the path of the landslide or mudflow, preferably towards higher ground.
- If caught, roll into a ball with your arms protecting your head. Do your best to avoid this situation, because the outcome will rarely be good.

2.11 TSUNAMIS

Tsunamis, previously called tidal waves, are not related to the weather, but are covered by Weather Radio and other Emergency Alert systems. They have some resemblance to storm surges experienced in large storms and hurricanes, but are potentially much more devastating.

They are caused by submarine earthquakes, volcanoes, and probably most commonly, landslides. Any sudden disturbance to the surface of the sea floor will displace water, which in turn can create a very fast moving wave.

Although the waves created in this way are not very high in the open ocean, they can build up rapidly into very powerful, often very high waves when they encounter shallow water near shore.

Small waves are quite common, but about once every three or four years true tsunamis occur somewhere, big enough to affect shoreline communities in their path.

The Pacific States of North America are at greatest risk of a tsunami, and a sophisticated monitoring system has been developed to provide quick warnings. Areas on the Atlantic are less at risk, but not immune.

Even large lakes in earthquake prone areas carry some risks of tsunamis.

ADVANCE PREPARATION

If you live close to the coast near sea level you face a very small but real risk of a tsunami. Take out insurance and store valuable documents and possessions off site.

Be familiar with local warning systems - sirens etc.

Also be familiar with escape routes to higher ground - you probably will not have to go far, just higher.

Prepare an emergency evacuation kit.

TSUNAMI ACTION PLAN

IF A TSUNAMI IS IMMINENT

- Monitor your Weather Radio or other radio or TV warnings. Warnings take three forms
- Advisory; an advisory tells of an earthquake which might generate a tsunami.
- Tsunami Watch; A Tsunami has or may have been generated, but is at least two hours away.
- Tsunami Warning; A tsunami was or may have been generated - damage is likely and evacuation is strongly advised.
- In the latter case, if you are at risk, move to higher ground as soon as possible. If you are caught by a tsunami your chances of survival are low - the combination of turbulent water and large amounts of debris are extremely dangerous, as was evident from the Asian tsunami on Boxing Day 2004.

DURING A TSUNAMI

- Get out of the danger area, and don't return until the sea has returned to normal, and stayed that way for at least half an hour.
- The first wave of a tsunami may be preceded by a general and extensive withdrawal of the sea, like an extremely low tide. This is an important and infallible danger signal, and you and your family should be looking for high ground.
- Tsunamis often consist of a series of large waves, which may be separated in time by many minutes. Do not return to the shoreline until you are certain that normal sea conditions have returned. This could be difficult, because there may be people in the affected zone who need help. Do what you must, but be extremely careful and be prepared to leave early and fast. The next wave may be higher, and you will be no help to anyone if you join the casualty list.

2.12 WILDFIRES

Wildfires start in vacant country, but can rapidly become a threat to isolated houses and communities on the fringes of urban areas. They are associated with hot, dry, windy weather.

They are started by lightning, accidents or out of control burn offs or campfires, and malicious people. For more information go to <http://www.home-weather-stations-guide.com/fire-weather.html>

Advice on house fires is included in "Are You Ready" but is outside the scope of this article.

Greatest risks are to houses or communities surrounded by large areas of forest, scrub or grasslands. Houses on ridges are particularly vulnerable.

Weather radio will advise of high risk days or approaching fires. On high fire danger days, monitor the radio and look out for smoke.

ADVANCE PREPARATION

Wildfires destroy property and take lives. They can move very fast, particularly if moving up hill with a strong wind behind them. They are also quite unpredictable, and can present major problems to people and vehicles trying to avoid them on the narrow, winding and often congested roads of many ridge top communities.

The first thing to do is to consult local authorities and emergency organizations to find out what level of risk you may be faced with.

As usual, if there is a possibility of damage or destruction of your house, take out adequate insurance, and find storage for important documents off site.

To help fireproof your house, keep the surrounding area clear of debris, and remove trees and shrubs, particularly flammable varieties, from near walls. Remove debris from the roof and gutters, and install fire protection and watering systems if necessary.

If you have a pool, consider installing a high pressure pump and hose.

Take great care with outside fires - burning off etc - don't be the one who starts a fire.

Thirteen Things You Must Know To Survive Severe Weather Emergencies

Prepare an emergency kit in case you need to evacuate in a hurry, and get to know your likely escape routes.

WILDFIRE ACTION PLAN

WHEN A FIRE IS APPROACHING

- Make an early decision about whether you will stay or leave. This may depend on how well you have fireproofed your house and yard.
- If you decide to stay, remain prepared to leave if the situation deteriorates. Pack car with emergency kit and valuables. Leave it facing your escape route with doors unlocked and windows up.
- Listen to Weather Radio or other information sources, and keep a look out for approaching smoke.
- Remove any flammable items from your yard and patio, and store inside.
- Place lawn sprinklers on your roof if possible, and turn on.
- Wet or remove trees and shrubs within 15 feet of your house.
- Close doors and windows and any vents to the roof or walls, and turn off gas cylinders.

DURING A FIRE

- This is a highly dangerous time, and your approach should be determined by how easy your house is to protect. Don't risk injury or worse by defending a lost cause.
- If you need to go outside, wear protective clothing – long sleeved shirts, full length trousers and a hat, and a mask if smoke is heavy. Full clothing will give some protection against radiant heat from the fire.
- Take great care at all times, and be prepared to leave if the situation worsens.

2.13 FOG

Fog is not usually regarded as a severe weather condition, although it is the subject of Weather Service warnings, but not usually on Weather Radio.

It is often a problem for air transport, and I guess you can still get lost in it, but I can't help much in either case.

The major fog hazard that most of us are likely to encounter is thick fog while driving. It is often a contributing cause to multiple vehicle accidents, many of which result in loss of life.

So let's take a brief look at driving in fog. For more general fog information check out

<http://www.home-weather-stations-guide.com/fog.html>

DRIVING IN FOG

There are two main hazards in driving in fog – leaving the road due to poor visibility, and hitting or being hit by other vehicles.

The main danger occurs when fast moving vehicles enter a patch of thick fog on a highway. Drivers respond in different ways and it is very easy for collisions to occur.

CHECKLIST FOR DRIVING IN FOG

- The best approach is to pull right off the road, safely, and turn on your hazard lights.
- Otherwise turn your headlights on low beam, turn your fog lights on if you have them, and slow down as gradually as conditions allow.
- Use your windscreen wipers and demister to maintain the clearest possible visibility, and watch out for brake lights in front of you. It probably does no harm to lightly touch your brakes occasionally as a warning to following traffic.
- Turn off your radio and open your windows - the sound of brakes or car horns may give you extra warning of problems ahead.
- When visibility is poor, use the white lines on the outside of the road as your guide - that's what they are there for.
- And check your speed regularly - it is very easy to speed up when your vision is restricted to a small area around the car.

3. CONCLUSIONS

I think it's fairly evident that no-one, not even someone with a well developed death wish, will ever face all thirteen types of weather emergencies. Most of us will not even have to face one emergency where life is seriously threatened. But I wouldn't mind betting that most of us have been worried, if not actually frightened, as severe or dangerous weather developed in front of our eyes.

It doesn't take much imagination to see a frightening situation develop into a full scale emergency, and that can happen so easily with large, severe thunderstorms, with their lightning, hail, tornadoes and other high velocity winds, not forgetting flash floods.

These little action guides will help you understand what is going on, and what is likely to happen. The more you know, and the better prepared you are, the more likely you are to handle a threatening situation with skill and calm competence. And whether they realize it or not, your family will have you to thank for turning an emergency into an adventure.

I hope you never have to face the types of severe weather that threaten life and property, but if you do, you should now be well prepared.

If you would like to know more about these and other forms of severe weather, visit my website at <http://home-weather-stations-guide.com/severe-weather.html>.

If you don't already own a home weather station, or are looking to upgrade the one you already have, try <http://www.home-weather-stations-guide.com/home-weather-station.html> This is also a good place to start if you are having problems with your weather station.

In the meantime, may your weather be full of interest, but low on surprises.