

# **On a Dark and Stormy Night: A Weather Guide for Indoors and Out**

Presenter: Tanya Ellenburg-Kimmet

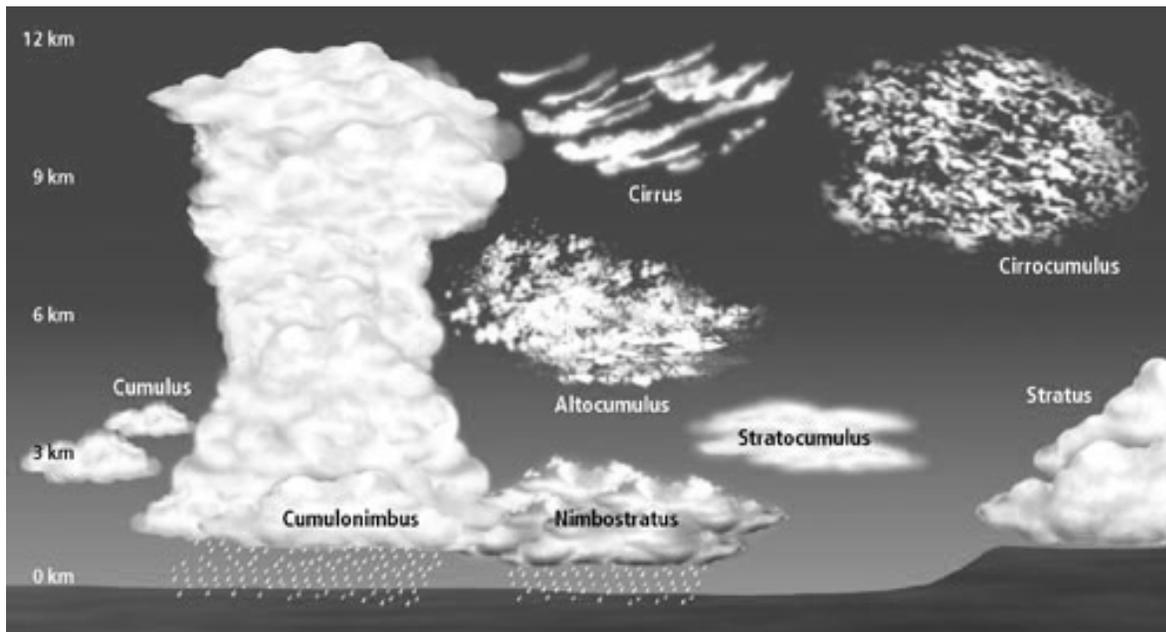
- ☞ Member of the Wilmington NOAA Storm Spotters
- ☞ I will provide resources in this presentation
- ☞ If someone professional says something that conflicts with what I said, go with what they said or research for yourself.

Email: [Tanya.kimmet@wright.edu](mailto:Tanya.kimmet@wright.edu)

[www.cyberwildstar.weebly.com](http://www.cyberwildstar.weebly.com)

Prezi Presentation found at: [www.cyberwildstar.weebly.com/on-a-dark-and-stormy-night.html](http://www.cyberwildstar.weebly.com/on-a-dark-and-stormy-night.html)

## Clouds



From: NOAA website

# Flood Safety

[ABOUT](#)[PREPARE](#)[RESPOND DURING](#)[RECOVER AFTER](#)

## Responding Appropriately During a Flood

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Listen to area radio and television stations and a NOAA Weather Radio for possible flood warnings and reports of flooding in progress or other critical information from the National Weather Service (NWS)

Be prepared to evacuate at a moment's notice.

When a flood or flash flood warning is issued for your area, head for higher ground and stay there.

Stay away from floodwaters. If you come upon a flowing stream where water is above your ankles, stop, turn around and go another way. Six inches of swiftly moving water can sweep you off of your feet.

If you come upon a flooded road while driving, turn around and go another way. If you are caught on a flooded road and waters are rising rapidly around you, get out of the car quickly and move to higher ground. Most cars can be swept away by less than two feet of moving water.

Keep children out of the water. They are curious and often lack judgment about running water or contaminated water.

Be especially cautious at night when it is harder to recognize flood danger.

Because standard homeowner's insurance doesn't cover flooding, it's important to have protection from the floods associated with hurricanes, tropical storms, heavy rains and other conditions that impact the U.S. For more flood safety tips and information on flood insurance, please visit the National Flood Insurance Program Web site at [www.FloodSmart.gov](http://www.FloodSmart.gov).

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[Home Fire Safety](#)

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[Flu Symptoms & Treatment](#)

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### *Learn More*

[Be Red Cross Ready - Flood Safety Checklist](#)

[Returning Home After a Hurricane or Flood - English | Spanish](#)

[Repairing Your Flooded Home - English | Spanish](#)

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# Tornado Safety

[ABOUT](#)[PREPARE](#)[RESPOND DURING](#)[RECOVER AFTER](#)

## How to Prepare for a Tornado

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During any storm, listen to local news or a NOAA Weather Radio to stay informed about tornado watches and warnings.

Know your community's warning system. Communities have different ways of warning residents about tornados, with many having sirens intended for outdoor warning purposes.

Pick a safe room in your home where household members and pets may gather during a tornado. This should be a basement, storm cellar or an interior room on the lowest floor with no windows.

Practice periodic tornado drills so that everyone knows what to do if a tornado is approaching.

Consider having your safe room reinforced. Plans for reinforcing an interior room to provide better protection can be found on the FEMA web site.

Prepare for high winds by removing diseased and damaged limbs from trees.

Move or secure lawn furniture, trash cans, hanging plants or anything else that can be picked up by the wind and become a projectile.

Watch for tornado danger signs:

- Dark, often greenish clouds – a phenomenon caused by hail
- Wall cloud – an isolated lowering of the base of a thunderstorm
- Cloud of debris
- Large hail
- Funnel cloud – a visible rotating extension of the cloud base
- Roaring noise

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***Learn More***[Be Red Cross Ready - Tornado Safety Checklist](#)

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# Tornado Safety

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## What to Do During a Tornado

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The safest place to be is an underground shelter, basement or safe room.

If no underground shelter or safe room is available, a small, windowless interior room or hallway on the lowest level of a sturdy building is the safest alternative.

-Mobile homes are not safe during tornadoes or other severe winds.

-Do not seek shelter in a hallway or bathroom of a mobile home.

If you have access to a sturdy shelter or a vehicle, abandon your mobile home immediately.

Go to the nearest sturdy building or shelter immediately, using your seat belt if driving.

Do not wait until you see the tornado.

If you are caught outdoors, seek shelter in a basement, shelter or sturdy building. If you cannot quickly walk to a shelter:

Immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy shelter.

If flying debris occurs while you are driving, pull over and park. Now you have the following options as a last resort:

-Stay in the car with the seat belt on. Put your head down below the windows, covering with your hands and a blanket if possible.

-If you can safely get noticeably lower than the level of the roadway, exit your car and lie in that area, covering your head with your hands.

Your choice should be driven by your specific circumstances.

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***Learn More***

[Be Red Cross Ready - Tornado Safety Checklist](#)

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## National Weather Service Weather Forecast Office Louisville, KY

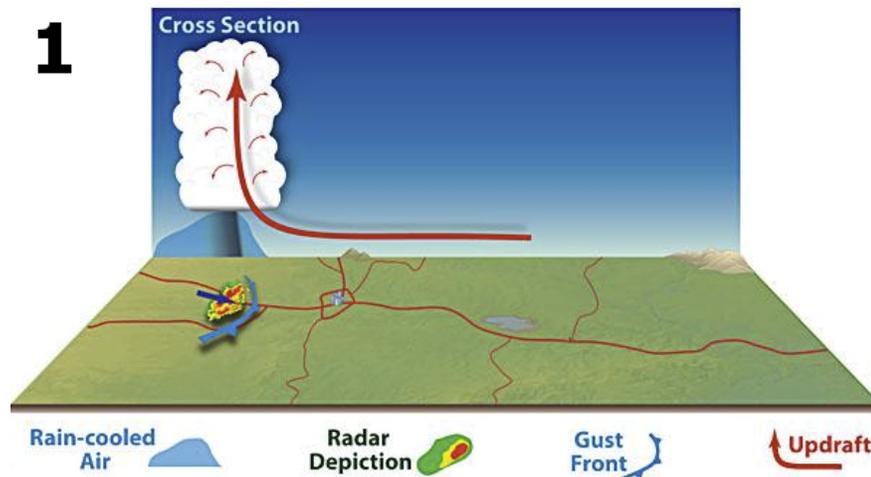
With the hot, and most of the time, humid weather conditions that come with summer in the Ohio Valley the threat of a somewhat rare type of severe thunderstorm event also looms. The event is known as a **derecho**.

A derecho (pronounced similar to "deh-REY-cho") is a widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. Although a derecho can produce destruction similar to the strength of tornadoes, the damage typically is directed in one direction along a relatively straight swath. As a result, the term "straight-line wind damage" sometimes is used to describe derecho damage. By definition, if the wind damage swath extends more than 240 miles (about 400 kilometers) and includes wind gusts of at least 58 mph (93 km/h) or greater along most of its length, then the event may be classified as a derecho.

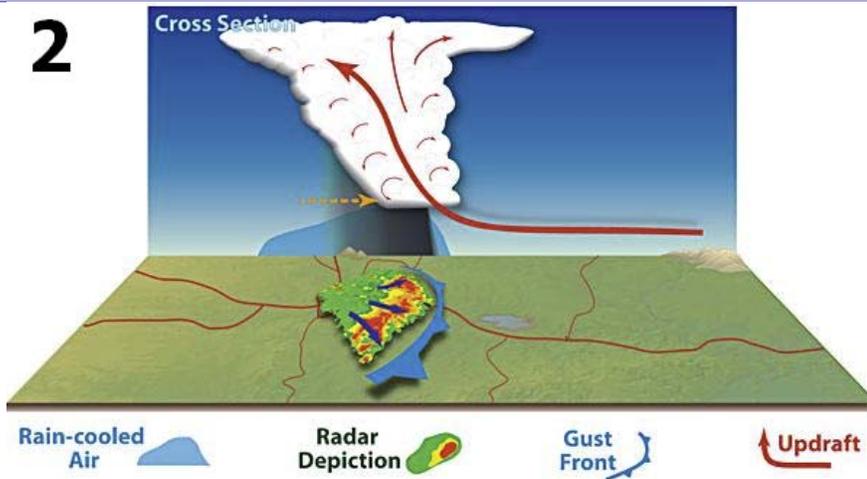


*The gust front "arcus" cloud on the leading edge of a derecho-producing storm system. The photo was taken on the evening of July 10, 2008 in Hampshire, Illinois. Credit: Brittney Misialek*

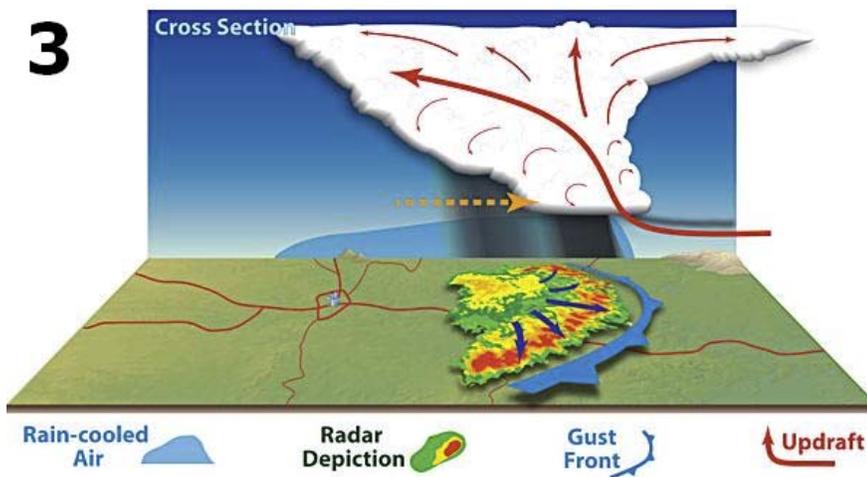
1.) Derecho development is necessarily tied to the formation of bow echoes. A [bow echo](#) usually arises from a cluster of thunderstorms, but also may evolve from a single strong storm. Bow echoes most frequently occur when atmospheric winds are relatively strong and unidirectional (i.e., they vary little in direction with height but increase in speed). As the rain-cooled downdraft of a thunderstorm reaches the earth's surface, it spreads horizontally, most rapidly in the direction of the mean atmospheric flow. As the cool, dense air spreads outward, it forces the lighter, warm and moist air surrounding the storm up along the leading edge of the outflow, or gust front (**see figure below, with mean flow assumed to be from left to right**). Gust fronts often are marked by a band of ominous, low clouds known as "arcus." (pictured above)



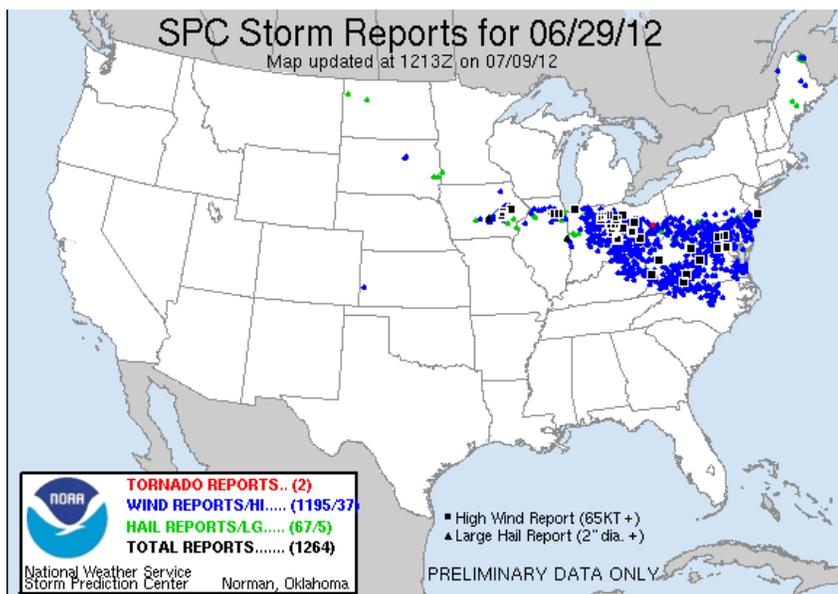
2.) The rain produced by the newer storms reinforces the cold pool, strengthening the inflow of air from the back side of the developing storm complex and encouraging the downward transport of higher momentum winds from aloft. These processes can enable the system to attain a nearly steady-state condition. This increases the longevity and strength of the entire system and is what allows the storm to travel such a large area over a short amount of time. At this point, the convective system typically exhibits a pronounced bow shape on radar (**see figure below**).



3.) As the thunderstorms continue to increase in coverage, even more rain-cooled air reinforces the cold pool (pictured below). The line of storms continue to accelerate either as one large bow echo or multiple smaller bow echoes within an overall line. At this point, widespread and persistent wind damage has been occurring for a prolonged period of time.



Below is an example of damaging wind reports left behind by the June 29, 2012 derecho that swept from the upper Midwest to the central Atlantic coast in a matter of hours. Almost 1,200 reports of damaging winds were received with numerous reports of wind gusts at hurricane force or greater (74 MPH). Powerful winds likely extended into the Atlantic Ocean.

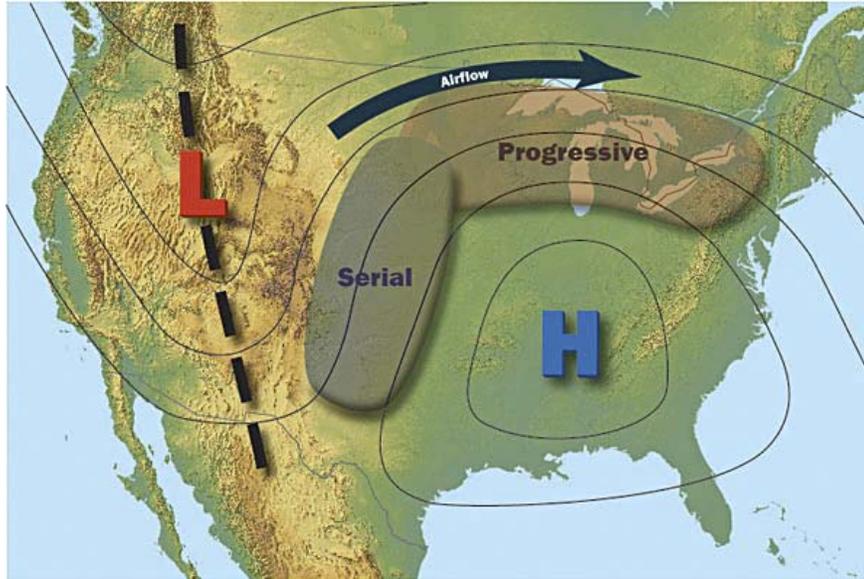


Below is an image depicting favorable weather patterns for derecho formation. A [progressive derecho](#) needs a very unstable (hot and moist) environment with relatively strong winds aloft. Therefore, the most favorable area for this type of storm to develop is on the periphery of a strong area of high pressure aloft where the greatest overlap of hot and dry conditions and stronger wind aloft occurs. In the image below the strongest winds aloft are where the pressure lines are

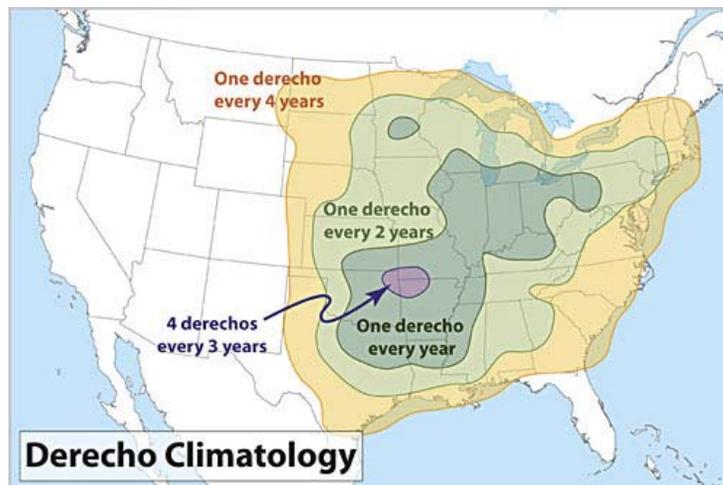
closest together.

One interesting note is that progressive derechos are much harder to forecast because of the environment that they thrive in. Many times, the best overlap of stronger winds aloft and hot and muggy conditions are in an area where the atmosphere is "capped" (a thin layer of warmer air in the low to mid levels that can inhibit upward vertical motion needed for thunderstorm updrafts). The cap is caused by the overall sinking motion that a high pressure aloft exhibits. The only way to initiate thunderstorms in this environment is through a triggering mechanism such as a disturbance in the mid to upper level flow, or from surface convergence caused by a frontal boundary in the area. Many times, these features are very subtle and hard to predict. Therefore, a progressive derecho can quickly develop with very little warning. To put this in perspective, consider the wind damage map from [above](#). Millions of people from the upper Midwest to along the Atlantic coast were heavily impacted throughout the day by a storm complex that initiated from a subtle disturbance in the upper level flow over northwest Iowa.

[Serial derechos](#) develop along a line more parallel to the mid level flow and therefore are a much longer line of storms, however travel shorter distance. The overall wind profile contains more directional shear (turning winds with height) which creates smaller but more bow echoes and increases the chance of brief tornadic spin-ups. Serial derechos are overall easier to forecast due to the nature of the large scale system that typically creates them.



Derechos in the United States most commonly occur along two axes. One extends along the "Corn Belt" from the upper Mississippi Valley southeast into the Ohio Valley, and the other from the southern Plains northeast into the mid Mississippi Valley (figure below). During the cool season (September through April), derechos are relatively infrequent but are most likely to occur from east Texas into the southeastern states. Although derechos are extremely rare west of the Great Plains, isolated derechos have occurred over interior portions of the western United States, especially during spring and early summer. Additional climatological information on United States derechos is available [here](#).



70% of all derechos occur between the months of May-August (the warm season). The other 30% occur during the cool season.

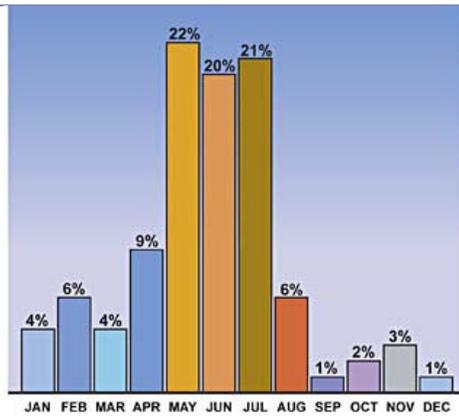


Photo taken by Doug Berry of the very impressive shelf cloud on the leading edge of the "People Chaser" Derecho of May 27, 2001 near Fort Supply, Oklahoma.



For more information and acknowledgements go to the Storm Prediction Center's [About Derechos page](#).

Web Site Owner:  
National Weather Service  
Louisville, KY Weather Forecast Office  
6201 Theiler Lane  
Louisville, KY 40229-1476  
502-969-8842  
Page Author: LMK Webmaster  
Web Master's E-mail: [w-lmk.webmaster@noaa.gov](mailto:w-lmk.webmaster@noaa.gov)  
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# Thunderstorm Safety

[ABOUT](#)[PREPARE](#)[RESPOND DURING](#)[RECOVER AFTER](#)

## Responding appropriately during a thunderstorm

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Listen to local news or NOAA Weather Radio for emergency updates. Watch for signs of a storm, like darkening skies, lightning flashes or increasing wind.

Postpone outdoor activities if thunderstorms are likely to occur. Many people struck by lightning are not in the area where rain is occurring.

If a severe thunderstorm warning is issued, take shelter in a substantial building or in a vehicle with the windows closed. Get out of mobile homes that can blow over in high winds.

If you can hear thunder, you are close enough to be in danger from lightning. If thunder roars, go indoors! The National Weather Service recommends staying inside for at least 30 minutes after the last thunder clap.

Avoid electrical equipment and telephones. Use battery-powered TVs and radios instead. Shutter windows and close outside doors securely. Keep away from windows.

Do not take a bath, shower or use plumbing.

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.

If you are outside and cannot reach a safe building, avoid high ground; water; tall, isolated trees; and metal objects such as fences or bleachers. Picnic shelters, dugouts and sheds are NOT safe.

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***Learn More***[Be Red Cross Ready - Thunderstorm Safety Checklist](#)

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## Lightning kills Yellow Springs woman in Colo.

Jul 14, 2014 - 06:57 GMT

A 42-year-old Yellow Springs woman was killed by lightning Friday while hiking with her husband and friend in Rocky Mountain National Park in Colorado. Rebecca R. Teilhet, her husband, Justin, and a friend were near the Ute Crossing Trail at 1:20 p.m. on Trail Ridge Road at roughly 11,400 feet, between Rainbow Curve and Forest Canyon Overlook, according to a park news release. ... ([continue reading](#))

Courtesy of [http://world.einnews.com/article\\_detail/213698937?lcode=CuwkUmcWV4N\\_x68rUqxwRA%3D%3D](http://world.einnews.com/article_detail/213698937?lcode=CuwkUmcWV4N_x68rUqxwRA%3D%3D)

1. Direct Strike: Bolt connects with object
2. Side Flash Side Splash: starts down the path and jumps to next object
3. Ground Current: Journey's down a tall object and follows the ground
4. Conduction journeys down the tall object and is conducted along a tangent metal object
5. Streamer: more rare form where when the main channel discharges, lesser ones discharge and connect to other objects

### Lightning Can Spread out Some 60 Feet after Striking Earth.

From [www.weather.com](http://www.weather.com)

## Hail



# Be Red Cross Ready

## Heat Wave Safety Checklist

In recent years, excessive heat has caused more deaths than all other weather events, including floods. A heat wave is a prolonged period of excessive heat, often combined with excessive humidity. Generally temperatures are 10 degrees or more above the average high temperature for the region during summer months, last for a long period of time and occur with high humidity as well.

### Know the Difference

**Excessive Heat Watch**—Conditions are favorable for an excessive heat event to meet or exceed local Excessive Heat Warning criteria in the next 24 to 72 hours.

**Excessive Heat Warning**—Heat Index values are forecast to meet or exceed locally defined warning criteria for at least 2 days (daytime highs=105-110° Fahrenheit).

**Heat Advisory**—Heat Index values are forecast to meet locally defined advisory criteria for 1 to 2 days (daytime highs=100-105° Fahrenheit).

### How can I prepare?



- Listen to local weather forecasts and stay aware of upcoming temperature changes.
- The heat index is the temperature the body feels when the effects of heat and humidity are combined. Exposure to direct sunlight can increase the heat index by as much as 15° F.
- Discuss heat safety precautions with members of your household. Have a plan for wherever you spend time—home, work and school—and prepare for the possibility of power outages.
- Check the contents of your emergency preparedness kit in case a power outage occurs.
- Know those in your neighborhood who are elderly, young, sick or overweight. They are more likely to become victims of excessive heat and may need help.
- If you do not have air conditioning, choose places you could go to for relief from the heat during the warmest part of the day (schools, libraries, theaters, malls).
- Be aware that people living in urban areas may be at greater risk from the effects of a prolonged heat wave than are people living in rural areas.
- Get trained in first aid to learn how to treat heat-related emergencies.
- Ensure that your animals' needs for water and shade are met.

### What should I do during a heat wave?



- Listen to a NOAA Weather Radio for critical updates from the National Weather Service (NWS).
- Never leave children or pets alone in enclosed vehicles.
- Stay hydrated by drinking plenty of fluids even if you do not feel thirsty. Avoid drinks with caffeine or alcohol.
- Eat small meals and eat more often.
- Avoid extreme temperature changes.
- Wear loose-fitting, lightweight, light-colored clothing. Avoid dark colors because they absorb the sun's rays.
- Slow down, stay indoors and avoid strenuous exercise during the hottest part of the day.
- Postpone outdoor games and activities.
- Use a buddy system when working in excessive heat.
- Take frequent breaks if you must work outdoors.
- Check on family, friends and neighbors who do not have air conditioning, who spend much of their time alone or who are more likely to be affected by the heat.
- Check on your animals frequently to ensure that they are not suffering from the heat.

### Recognize and care for heat-related emergencies ...



**Heat cramps** are muscular pains and spasms that usually occur in the legs or abdomen caused by exposure to high heat and humidity and loss of fluids and electrolytes. Heat cramps are often an early sign that the body is having trouble with the heat.

**Heat exhaustion** typically involves the loss of body fluids through heavy sweating during strenuous exercise or physical labor in high heat and humidity.

- Signs of heat exhaustion include cool, moist, pale or flushed skin; heavy sweating; headache; nausea; dizziness; weakness; and exhaustion.
- Move the person to a cooler place. Remove or loosen tight clothing and apply cool, wet cloths or towels to the skin. Fan the person. If the person is conscious, give small amounts of cool water to drink. Make sure the person drinks slowly. Watch for changes in condition.
- If the person refuses water, vomits or begins to lose consciousness, **call 9-1-1** or the local emergency number.

**Heat stroke** (also known as sunstroke) is a life-threatening condition in which a person's temperature control system stops working and the body is unable to cool itself.

- Signs of heat stroke include hot, red skin which may be dry or moist; changes in consciousness; vomiting; and high body temperature.
- Heat stroke is life-threatening. **Call 9-1-1** or the local emergency number immediately.
- Move the person to a cooler place. Quickly cool the person's body by giving care as you would for heat exhaustion. If needed, continue rapid cooling by applying ice or cold packs wrapped in a cloth to the wrists, ankles, groin, neck and armpits.

### Let Your Family Know You're Safe

If your community experiences a disaster, register on the American Red Cross Safe and Well Web site available through [RedCross.org](http://RedCross.org) to let your family and friends know about your welfare. If you don't have Internet access, call **1-866-GET-INFO** to register yourself and your family.



For more information on disaster and emergency preparedness, visit [RedCross.org](http://RedCross.org).

# Estimated Vehicle Interior Air Temperature v. Elapsed Time

Estimated Vehicle Interior Air Temperature v. Elapsed Time

Elapsed time	Outside Air Temperature (F)					
	70	75	80	85	90	95
0 minutes	70	75	80	85	90	95
10 minutes	89	94	99	104	109	114
20 minutes	99	104	109	114	119	124
30 minutes	104	109	114	119	124	129
40 minutes	108	113	118	123	128	133
50 minutes	111	116	121	126	131	136
60 minutes	113	118	123	128	133	138
> 1 hour	115	120	125	130	135	140

Courtesy Jan Null, CCM; Department of Geosciences, San Francisco State University

# Winter Storm Preparedness

[ABOUT](#)[PREPARE](#)[RESPOND DURING](#)

## How to Prepare for a Winter Storm

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Winterize your vehicle and keep the gas tank full. A full tank will keep the fuel line from freezing.

Insulate your home by installing storm windows or covering windows with plastic from the inside to keep cold air out.

Maintain heating equipment and chimneys by having them cleaned and inspected every year.

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.

## Put Together a Supply Kit

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Water—at least a 3-day supply; one gallon per person per day

Food—at least a 3-day supply of non-perishable, easy-to-prepare food

Flashlight

Battery-powered or hand-crank radio (NOAA Weather Radio, if possible)

Extra batteries

First aid kit

Medications (7-day supply) and medical items (hearing aids with extra batteries, glasses, contact lenses, syringes, etc.)

Multi-purpose tool

Sanitation and personal hygiene items

Copies of personal documents (medication list and pertinent medical information, proof of address, deed/lease to home, passports, birth certificates, insurance policies)

Cell phone with chargers

Family and emergency contact information

Extra cash

Baby supplies (bottles, formula, baby food, diapers)

Pet supplies (collar, leash, ID, food, carrier, bowl)

Tools/supplies for securing your home

Sand, rock salt or non-clumping kitty litter to make walkways and steps less slippery

Warm coats, gloves or mittens, hats, boots and extra blankets and warm clothing for all household members

Ample alternate heating methods such as fireplaces or wood- or coal-burning stoves

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### Previous

[Wildfire Preparedness](#)

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***Learn More***

[Be Red Cross Ready - Winter Storm Safety Checklist](#)

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# Winter Storm Preparedness

[ABOUT](#)[PREPARE](#)[RESPOND DURING](#)

## Remaining Safe During a Winter Storm

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Listen to a NOAA Weather Radio or other local news channels for critical information on snow storms and blizzards from the National Weather Service (NWS).

Bring pets/companion animals inside during winter weather. Move other animals or livestock to sheltered areas and make sure that their access to food and water is not blocked by snow drifts, ice or other obstacles.

Running water, even at a trickle, helps prevent pipes from freezing.

All fuel-burning equipment should be vented to the outside and kept clear.

Keep garage doors closed if there are water supply lines in the garage.

Open kitchen and bathroom cabinet doors to allow warmer air to circulate around the plumbing. Be sure to move any harmful cleaners and household chemicals up out of the reach of children.

Keep the thermostat set to the same temperature both during the day and at night. By temporarily suspending the use of lower nighttime temperatures, you may incur a higher heating bill, but you can prevent a much more costly repair job if pipes freeze and burst.

Go to a designated public shelter if your home loses power or heat during periods of extreme cold.

Avoid driving when conditions include sleet, freezing rain or drizzle, snow or dense fog. If travel is necessary, keep a disaster supplies kit in your vehicle.

Before tackling strenuous tasks in cold temperatures, consider your physical condition, the weather factors and the nature of the task.

Protect yourself from frostbite and hypothermia by wearing warm, loose-fitting, lightweight clothing in several layers. Stay indoors, if possible.

Help people who require special assistance such as elderly people living alone, people with disabilities and children.

## Caution: Carbon Monoxide Kills

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Never use a generator, grill, camp stove or other gasoline, propane, natural gas or charcoal-burning devices inside a home, garage, basement, crawlspace or any partially enclosed area. Locate unit away from doors, windows and vents that could allow carbon monoxide to come indoors.

The primary hazards to avoid when using alternate sources for electricity, heating or cooking are carbon monoxide poisoning, electric shock and fire.

Install carbon monoxide alarms in central locations on every level of your home and outside sleeping areas to provide early warning of accumulating carbon monoxide.

If the carbon monoxide alarm sounds, move quickly to a fresh air location outdoors or by an open window or door.

Call for help from the fresh air location and remain there until emergency personnel arrive to assist you.

## Cold-Related Emergencies

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Frostbite and hypothermia are two dangerous and potentially life-threatening emergencies. Learn how to care for these emergencies by taking a first aid class.

To be prepared:

- Multi-tool
- Outdoor shoes/boots
- Raingear
- Radio – hand cranked
- Flashlight
- Batteries
- Blankets
- Bottled water
- Canned food or dry rations
- First Aid Kit
- Medicines
- Toilet paper
- Cash
- Map
- Maybe even a Tarp
- Camera – for damages and documentation
- List of hotels/shelters (and if you have pets, ones that accommodate them)
- Contact info
- Important documents
- A meeting place assigned for family members who are separated/lost
- Keep gas in the vehicle

Links:

[www.noaa.gov](http://www.noaa.gov)

[www.stormready.noaa.gov/contact.htm](http://www.stormready.noaa.gov/contact.htm)

[www.nws.noaa.gov/skywarn](http://www.nws.noaa.gov/skywarn)

[www.redcross.gov](http://www.redcross.gov)

[www.avma.org](http://www.avma.org)

[www.nationalgeographic.com](http://www.nationalgeographic.com)

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