

Lightning Safety

Introduction

Every thunderstorm produces lightning, which causes more loss of life annually than tornadoes. Lightening can be produced in winter during a phenomenon known as thunder snow. In addition, there are lightning flashes that can travel horizontally for miles from a thunderstorm. These 'bolts from the blue' have also caused fatalities.

In addition to lightning hazards associated with thunderstorms, heavy rain can lead to flash flooding. Strong wind, hail and even tornadoes are dangers associated with thunderstorms. A severe thunderstorm is defined as one that produces $\frac{3}{4}$ inch (or larger hail), winds of 58 mph or higher or tornadoes. Luckily only about 10% of the ~ 100,000 thunderstorms that occur annually in the U.S. are severe.

Risk Assessment

Risks of injury from thunderstorms are greatest for people outdoors. Before going into the field:

- Check the predicted weather conditions for the area of work. Note: watches are generally issued under the county name. **A watch** is intended to heighten public awareness, and **a warning** indicates imminent danger to life and property in the path of a storm. Tornado watches or warnings may also be issued in areas prone to these weather phenomena.
- Know the weather patterns for the area. In mountainous areas, thunderstorms generally build in the afternoon hours, so work should be conducted in the morning hours to the extent possible.

Once in the field:

- look for signs of approaching storms. Dark, threatening clouds overhead may be indications of a pending thunder storm. If you can hear thunder, you are close enough to the storm to be struck by lightning.
- keep a radio with you for weather updates, if possible.
- If camping at the field site, do not locate your campsite in an open field, on top of a hill or on a ridge top. Keep the camp away from tall isolated trees/objects. In a forested areas, camp near a lower stand of trees. In open areas, look for ravines or low lying areas as campsite, but be sure to consider the flashflood potential for these areas.
- During a thunderstorm, metal fences, poles and even backpack frames can be a hazard. Wet ropes may also become conductors of electricity if contacted by lightening.

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If caught during a thunderstorm, find shelter immediately!

- Follow the **30/30 Rule**. Seek shelter immediately if the time between the lightning flash and the thunder clap is less than 30 seconds and do not resume work until 30 minutes after the last thunder clap.
- If possible, move to a safe building or vehicle¹. **DO NOT** take shelter in small sheds, shallow caves or under trees. Once inside, stay away from showers, sinks, hot tubs, etc., and electronic equipment (like TVs, radios and computers).
- Get out of open exposed areas. Avoid tall structures such as towers, fences, and power/telephone lines, solitary trees or rock spires. Move off ridges and keep out of open fields. Stay away from sharp changes in terrain such as the edge of a forest or water's edge which are more hazardous locations.
- If hiking/climbing in a group, spread out at least 20 feet apart. If you have metal gear, remove it from your pack.
- Get out of boats and away from water. Small boats without cabins account for most of the boating lightening injuries and deaths. If you cannot get to shore, anchor the boat and get as low as possible. Larger boats with cabins are somewhat safer, especially if they are equipped with properly installed lightning protection systems. Stay in the cabin, away from metal and off the radio unless it is a serious emergency.
- If in a vehicle, pull safely onto the shoulder away from trees that could fall on the vehicle. Stay in the car with the emergency flashers on until the heavy rains subside.
- If biking or on a motorcycle, seek shelter under an overpass, ditch or other low lying area. Lay bikes on ground away from you, motorcycles should be left at least 50 feet away from where you are seeking shelter. Keep away from steel girders, bridges and high tension wires. If safe shelter is not available, assume the lightening desperation position described below. The same information is applicable to other topless vehicles.
- **Do not use** electronic devices such as HAM radio or cell phones. Emergency radio equipment must be used with extreme caution during a lightning storm.
- **If no safe shelter¹ is available:**
 - Go to an open space and squat low to the ground as quickly as possible. Sit on top of your pack (metal objects removed first) if you have one with your feet on the ground.
 - If in the woods find an area protected by a low clump of trees. Avoid standing underneath a single large tree in the open.

¹ As defined in attachment 1.

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- If you are isolated in a level area and you feel your hair stand on end (indication that a lightning strike is imminent), bend forward, putting your hands on your knees (a position with feet together and crouching while removing all metal objects is recommended). This is known as the lightning desperation position. Do not lie flat on the ground.
- While crouching as low as you can, close your eyes and clasp your hands over your ears, because sight and hearing injuries are common lightning strike or near strike injuries.
- If flash flooding is a possibility, as soon as it is safe to move, make your way to higher ground. Avoid flooded roadways. Do not attempt to drive to safety as many flash flood deaths occur in automobiles.

If someone is hit by lightning start medical treatment immediately. (They are not electrified as might be the case with a person electrocuted from a downed power line.) Check the ABCs and start CPR or rescue breathing as appropriate. Electrical burns are treated just like any other burn. Other injuries may not be obvious, so anyone struck by lightning should seek treatment from a medical professional as soon as possible.

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Attachment 1

Safe and Unsafe Shelters from the National Weather Service

Safe Buildings—Fully enclosed structures with a roof, walls and floor.

Safe Vehicles—A hard-topped car, SUV, minivan, bus, etc. Be sure all the doors are closed and windows are rolled up. Do not touch any metal surfaces.

Unsafe Buildings—Carports; covered, but open garages; covered patio, picnic shelters, beach shacks/pavilions; golf shelters; camping and large outdoor tents; baseball dugouts; other partially opened structures.

Unsafe vehicles—Topless or soft-topped vehicles, such as bikes, motorcycles, convertibles, canopied tractors, ATVs, snowmobiles, etc.