

NOAA Knows...

# Lightning

Lightning is one of the most underrated severe weather hazards, yet ranks as one of the top weather killers in the United States. Lightning strikes in America kill about 56 people and injure hundreds of others each year.

Unlike other weather hazards that often involve sophisticated watches and warnings from NOAA's National Weather Service, lightning can occur anywhere there is a thunderstorm. That's why the National Weather Service conducts an on-going campaign to educate people about lightning risks.

## The Shocking Truth

Lightning is a rapid discharge of electrical energy in the atmosphere. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel.

During a thunderstorm, winds within the thunderstorm cloud cause collision between the various precipitation particles within the storm cloud. These collisions cause very small ice crystals to lose electrons while larger particles of soft hail gain electrons.

Upward winds within the cloud redistribute these particles and the charges

they carry. The soft hail causes a negative charge build up near the middle and lower part of the storm cloud which, in turn, causes a positive charge to build up on the ground beneath the storm cloud.

Eventually, when the charge difference between the negative charge in the cloud and the positive charge on the ground become large, the negative charge starts moving toward the ground. As it moves, it creates a conductive path toward the ground.

This path follows a zigzag shape as the negative charge jumps through segments in the air. When the

negative charge from the cloud makes a connection with the positive charge on the ground, current surges through the jagged path, creating a visible flash of lightning.

Thunder, high winds, darkening skies, rainfall and brilliant flashes of light are warning signs for lightning strikes.

## Lightning Quick Facts

- ▶ Lightning often strikes the **same place repeatedly** if it is a tall, isolated object.
- ▶ Most lightning victims are **in open areas or near a tree**.
- ▶ In Florida, lightning **kills more people** than all other storm-related weather events.
- ▶ Lightning can heat its path through the air to **five times hotter** than the surface of the sun.

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While most lightning casualties occur at the beginning of an approaching storm, a significant number of lightning deaths occur after the thunderstorm has passed. If thunder is heard, then the storm is close enough for a lightning strike. It is very important to seek safe shelter immediately.

### When Thunder Roars, Go Indoors

The safest place to be when lightning threatens is in a substantial structure with electricity and plumbing.

However, when inside during a thunderstorm, avoid contact with anything that could conduct a lightning strike to you, including anything that plugs into a wall outlet, corded phones, plumbing, metal doors, and window frames.

This means do not take a shower or bath during a thunder storm. Battery-operated computers and cell phones are fine. Generally, enclosed metal vehicles (not convertibles), with the windows rolled up, provide good shelter from lightning.



*Cattle killed by a single lightning strike.*

When lightning can be seen or heard, the danger is already present.

If a storm is approaching, get inside immediately. Gazebos, rain or picnic shelters, baseball dugouts, convertible vehicles, and golf carts do *not* provide protection from lightning.

Thunder becoming louder or more frequent is a sign that lightning activity is approaching, increasing the risk for lightning injury or death.

Organizers of outdoor events should monitor the weather and evacuate participants as soon as they hear thunder. School buses are excellent lightning shelters.

Consider placing lightning safety tips and/or the action plan in game programs, flyers, scorecards, etc., and placing lightning safety cards around the area.

Most importantly, keep an eye on the sky, listen for thunder, and stay informed by listening to NOAA Weather Radio—All Hazards.

For more lightning information and safety tips, visit <http://www.lightningsafety.noaa.gov>.

To learn more about NOAA, visit <http://www.noaa.gov>. 

