

THUNDERSTORMS AND LIGHTNING

Each year in the United States, lightning kills an estimated 80 people and injures 300 more. All thunderstorms produce lightning and all have the potential for danger. Those dangers can include tornadoes, strong winds, hail, wildfires and flash flooding, which is responsible for more fatalities than any other thunderstorm-related hazard.

Lightning's risk to individuals and property is increased because of its unpredictability, which emphasizes the importance of preparedness. It often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall. Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.

Remember, even though the severe weather that often occurs with thunderstorms and lightning often passes swiftly, you should have an [Emergency Supply Kit](#) and a [Family Communications Plan](#) ready *before* the emergency happens.

WHY TALK ABOUT THUNDERSTORMS?

They Produce:

Tornados ...

- ❖ Cause an average of 70 fatalities and 1,500 injuries every year.
- ❖ Produce wind speeds in excess of 250 mph.
- ❖ Can be one mile wide and stay on the ground over 50 miles.

Lightning ...

- ❖ Causes an average of 80 fatalities and 300 injuries each year.
- ❖ Occurs with all thunderstorms.

Strong Winds...

- ❖ Can exceed 100 mph.
- ❖ Can cause damage equal to a tornado.
- ❖ Can be extremely dangerous to aviation.

Flash Flooding...

- ❖ Is the #1 cause of deaths associated with thunderstorms...more than 140 fatalities each year.

Hail...

- ❖ Causes more than \$1 billion in crop and property damage each year.

Thunderstorms affect relatively small areas when compared with hurricanes and winter storms. Despite their small size, ALL thunderstorms are dangerous! The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Of the

estimated 100,000 thunderstorms that occur each year in the United States, about 10% are classified as severe.

WHAT ARE THUNDERSTORMS? WHAT CAUSES THEM?

- ❖ Every Thunderstorm Needs:
 - ◆ **Moisture** – to form clouds and rain.
 - ◆ **Unstable Air** – warm air that can rise rapidly.
 - ◆ **Lift** – cold or warm fronts, sea breezes, mountains, or the sun's heat are capable of lifting air to help form thunderstorms.
- ❖ The National Weather Service considers a thunderstorm severe if it produces hail at least 3/4-inch in diameter, winds of 58 mph or stronger, or a tornado.

BE INFORMED

Familiarize yourself with the terms that are used to identify a thunderstorm hazard

- ❖ A **thunderstorm watch** means there is a possibility of a thunderstorm in your area. This is the time to locate a safe place in the home and tell family members to watch the sky and listen to the radio or television for more information.
- ❖ A **thunderstorm warning** means a thunderstorm is occurring or will likely occur soon. If you are advised to take shelter, do so immediately.

Prepare Your Home

- ❖ Remove dead or rotting trees and branches that could fall and cause injury or damage during a severe thunderstorm.
- ❖ Secure outdoor objects that could blow away or cause damage.
- ❖ Shutter windows and secure outside doors. If shutters are not available, close window blinds, shades or curtains.

LIGHTNING

How Lightning Forms

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas. Rising and descending air within a thunderstorm separates these positive and negative charges. Water and ice particles also affect charge distribution. A cloud-to-ground lightning strike begins as an invisible channel of

electrically charged air moving from the cloud toward the ground. When one channel nears an object on the ground, a powerful surge of electricity from the ground moves upward to the clouds and produces the visible lightning strike.

30/30 Lightning Safety Rule

Go indoors if, after seeing lightning, you cannot count to 30 before hearing thunder. Stay indoors for 30 minutes after hearing the last clap of thunder.

Lightning Facts

- ❖ Lightning causes an average of 80 fatalities and 300 injuries per year
- ❖ Lightning occurs in all thunderstorms; each year lightning strikes the Earth 20 million times!
- ❖ The energy from one lightning strike could light a 100-watt light bulb for more than 3 months.
- ❖ Most lightning fatalities and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
- ❖ Lightning can occur from cloud-to-cloud, within a cloud, cloud-to-ground, or cloud-to-air.
- ❖ Many fires in the western United States and Alaska are started by lightning.
- ❖ The air near a lightning strike is heated to 50,000°F – hotter than the surface of the sun! The rapid heating and cooling of the air near the lightning channel causes a shock wave that results in thunder.

STRAIGHT-LINE WINDS

- ❖ Straight-line winds are responsible for most thunderstorm wind damage.
- ❖ Winds can exceed 100 mph!
- ❖ One type of straight-line wind, a downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation.
- ❖ A “dry microburst” is a downburst that occurs with little or no rain. These destructive winds are most common in the western United States.

What is the difference between straight-line winds and a tornado?

Straight-line winds blow mainly in one direction whereas a tornado has spinning or rotating winds. Damage from straight-line winds generally is pushed in the same direction. Damage from a tornado does not generally show that specific of a direction, but instead scatters debris in a variety of directions.