



Thunderstorms

What is a thunderstorm?

A thunderstorm is a storm with lightning and thunder. Its produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain and sometimes hail.



What causes a thunderstorm?

The basic ingredients used to make a thunderstorm are moisture, unstable air and lift. You need moisture to form clouds and rain. You need unstable air that is relatively warm and can rise rapidly. Finally, you need lift. This can form **from** fronts, sea breezes or mountains.

What is a severe thunderstorm?

A thunderstorm is classified as “severe” when it contains one or more of the following: hail one inch or greater, winds gusting in excess of 58 mph (50 knots), or a tornado.



Where are severe thunderstorms most common?

The greatest severe weather threat in the U.S. extends from Texas to southern Minnesota. But, no place in the United States is completely safe from the threat of severe weather.

What are the stages of a thunderstorm?

Thunderstorms have three stages in their life cycle: The developing stage, the mature stage, and the dissipating stage. The **developing stage** of a thunderstorm is marked by a cumulus cloud that is being pushed upward by a rising column of air (updraft). The cumulus cloud soon looks like a tower (called towering cumulus) as the updraft continues to develop. There is little to no

rain during this stage but occasional lightning. The thunderstorm enters the mature stage when the updraft continues to feed the storm, but precipitation begins to fall out of the storm, creating a downdraft (a column of air pushing downward). When the downdraft and rain-cooled air spreads out along the ground it forms a gust front, or a line of gusty winds. The **mature stage** is the most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes. Eventually, a large amount of precipitation is produced and the updraft is overcome by the downdraft beginning the **dissipating stage**. At the ground, the gust front moves out a long distance from the storm and cuts off the warm moist air that was feeding the thunderstorm. Rainfall decreases in intensity, but lightning remains a danger.

What is a single-cell thunderstorm?

Often called “popcorn” convection, single-cell thunderstorms are small, brief, weak storms that grow and die within an hour or so. They are typically driven by heating on a summer afternoon. Single-cell storms may produce brief heavy rain and lightning.



What is a multi-cell thunderstorm?

A multi-cell storm is a common, garden-variety thunderstorm in which new updrafts form along the leading edge of rain-cooled air or the gust front. Individual cells usually last 30 to 60 minutes, while the system as a whole may last for many hours. Multicell storms may produce hail, strong winds, brief tornadoes, and/or flooding.



What is a squall line?

A squall line is a group of storms arranged in a line, often accompanied by “squalls” of high wind and heavy rain. Squall lines tend to pass quickly and are less prone to produce tornadoes than are supercells. They can be hundreds of miles long but are typically only 10 or 20 miles wide.

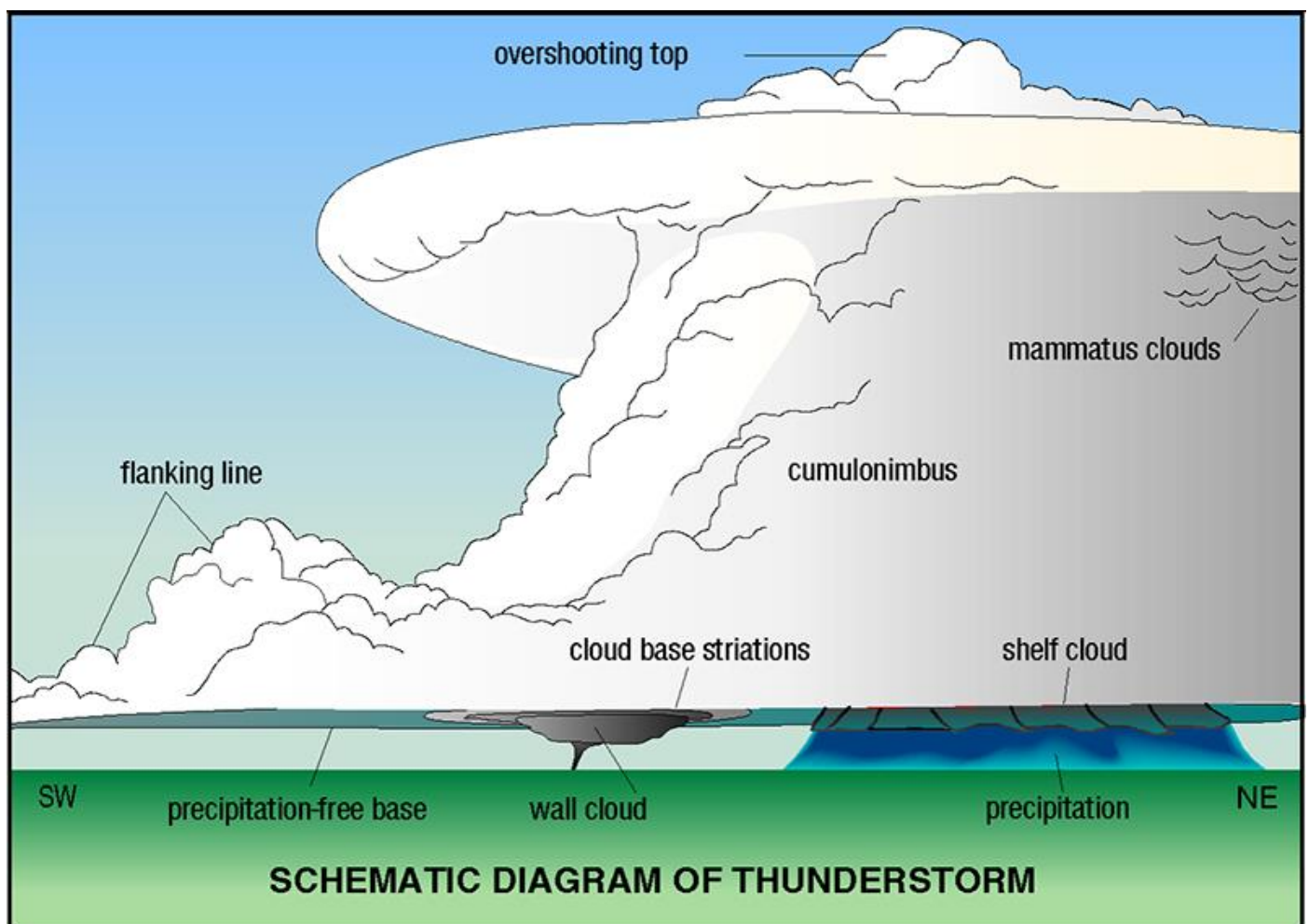
What is a supercell thunderstorm?

A supercell is a long-lived (greater than 1 hour) and highly organized storm feeding off an updraft (a rising current of air) that is tilted and rotating. This rotating updraft – as large as 10 miles in diameter and up to 50,000 feet tall – can be present as much as 20 to 60 minutes before a tornado forms. Scientists call this rotation a mesocyclone when it is detected by Doppler radar. The tornado is a very small extension of this larger rotation. Most large and violent tornadoes come from supercells.



What does a thunderstorm look like?

Thunderstorms can look like tall heads of cauliflower or they can have “anvils.” An anvil is the flat cloud formation at the top of the storm. An anvil forms when the updraft (warm air rising) has reached a point where the surrounding air is about the same temperature or even warmer. The cloud growth abruptly stops and flattens out to take the shape of an anvil.



When are thunderstorms most likely to occur?

Thunderstorms can occur year-round and at all hours. But they are most likely to happen in the spring and summer months and during the afternoon and evening hours. Along the Gulf Coast and across the southeastern and western states, most thunderstorms occur during the afternoon. Thunderstorms frequently occur in the late afternoon and at night in the Plains states.

How many thunderstorms are there?

Worldwide, there are an estimated 16 million thunderstorms each year, and at any given moment, there are roughly 2,000 thunderstorms in progress. There are about 100,000 thunderstorms each year in the U.S. alone. About 10% of these reach severe levels.



What kinds of damage can thunderstorms cause?

Many hazardous weather events are associated with thunderstorms. Under the right conditions, rainfall from thunderstorms causes flash flooding, killing more people each year than hurricanes, tornadoes or lightning. Lightning is responsible for many fires around the world each year, and causes fatalities. Hail up to the size of softballs damages cars and windows, and kills livestock caught out in the open. Strong (up to more than 120 mph) straight-line winds associated with thunderstorms knock down trees, power lines and mobile homes.

Tornadoes (with winds up to about 300 mph) can destroy all but the best-built man-made structures.

