

Approaching Storm Guide

The purpose of this section is to give spotters guidance on which features might be seen at different times during an approaching thunderstorm. The spotter is reminded that thunderstorms vary and also that position relative to the storm will greatly affect perception of a storm. This is only a general guide.

As a spotter you might first recognize a shelf cloud approaching from the west or southwest. It will appear as a dark, low level horizontal wedge shaped cloud, on the leading edge of a group of cumulonimbus clouds. As the cloud gets overhead, winds usually pick up from the direction of the storm. The temperature will drop as rain cooled air is blown out from the storm, and light rain may fall. The underside of the shelf cloud may appear turbulent. If the shelf cloud is ahead of a LINE of thunderstorms, straight line winds may exceed 50 or 60 mph and cause damage. Watch trees and man made objects around the immediate area. If medium sized branches break, signboards are blown over and shingles are removed from rooftops, windspeeds are likely to be greater than 50-55 mph and should be reported into net control. If no tree branches are breaking, or only twigs and leaves are stripped from trees, winds are likely not over 50 mph.

As the rain approaches, detached and fragmented clouds may be seen moving rapidly out from the rain area. These are scud clouds caused by the cool, rainy air condensing into clouds. If these clouds are close to the base of the storm, they may appear as a lowering of the thunderstorm base. Since this is the leading edge of the storm, there is no possibility that this is a wall cloud.

Wall clouds never form on the leading edge of a storm. The best way to determine if lower clouds are scud clouds is to watch them for a minute or two. Scud clouds will generally be moving rapidly away from the storm since they are carried with the wind. Scud clouds do not produce severe weather, and these clouds moving away from the rain area simply mean that the thunderstorm downdraft has reached the surface and rain cooled air is being expelled from the storm.

As the shelf cloud passes, rain will usually increase to moderate or heavy in intensity. Some small hail may also fall. All hail occurrences should be reported to net control. There will also likely be more lower detached scud clouds in and around the rain area at this time. If hail size increases to 1/2 or 3/4 inches in diameter, the storm is a fairly intense one, and should be monitored closely. Once hail is reported, it need not be called to net control again unless there is a dramatic increase in size, if hail covers the ground, or if hail is falling from the back of the storm and the rain has ceased. All these events point to a severe thunderstorm. There is no need to report an increase of hail size from pea size to marble size, for example.

If the rain becomes intense and lasts for 20-30 minutes, beware of flash flooding potential. Observe the local terrain and be ready to move if you find you're in a low lying area. If flash flooding occurs, it should be reported into net control.

As the precipitation lets up, it will become lighter as the thicker clouds from the thunderstorm pull away (if the storm occurs during daylight hours). If the rain lets up, and no hail is falling, there is likely little additional information to be relayed to net control. Most thunderstorms will produce damaging winds on the leading edge of the storm. If hail has ended, there is no need to report into net control that this has occurred. If rain has also ended, there will be nothing further to report. This is the situation for MOST storms.

A small fraction of Minnesota thunderstorms are called supercells. These storms are longer lasting and are more intense than most thunderstorms. As a spotter, if you observe that rainfall is intense, is lasting over 30 minutes, is accompanied by moderate to large hail, and the thunderstorm appears to be slow moving, there is a potential that the storm overhead could be a supercell. Additional clues would be the presence of feeder clouds which appeared to spiral in and wrap around the thunderstorm in low to middle levels as the storm approached.

These clues should be an alert signal that a strong storm is overhead. If hail occurs in the rain area, and then continues for a short time AFTER THE RAIN HAS ENDED, be especially aware of cloud conditions overhead. In this case, there MAY be more to report to net control. The updraft of a supercell storm is often on the rear, or right rear of the cell. A lowering of the cloud base on the BACK of a storm may be a wall cloud. The key is to watch any suspicious looking clouds for several minutes. A wall cloud will normally be attached to the thunderstorm base, and will move WITH the rain area, NOT AWAY from it. A wall cloud is an ABRUPT lowering of the updraft cloud base, and is typically 1-4 miles in diameter.

Any spotter which experiences intense rain and hail beneath a storm, and also experiences hail AFTER the rain has ended, should be looking closely at the cloud bases nearby and overhead. If a lowering is noted to persist 2 minutes (persistence is the key) and IT IS MOVING AWAY WITH THE RAIN AREA, continue to watch closely for rotation, or funnel clouds around the area. If the lowering persists for a minute or two more, and if rotation of the wall cloud is observed, or any funnels are seen, report this immediately to net control. If the lowering persists for 5 minutes more even without rotation, report a possible wall cloud to net control. In general, it's always good practice during spotting to be aware of one's location in relation to a thunderstorm. Knowing relative positioning will help anticipate what is likely to occur next.

Remember to look out for number one (yourself). Lightning is probably the most dangerous part of storm spotting. Your chances of being caught in a tornado are extremely low, since only 17 are observed in the state of Minnesota during an average year. A good storm spotter is one who is observant, patient, remains calm and keeps safety in mind!!