

**Storm Spotter Standard Operating Procedures
Department of Emergency Management
Butler County, Kansas**



Photo by Paula Hattrup

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INTRODUCTION

“So you want to be a storm spotter with the Department of Emergency Management?”

Are you the type of person that gets goosebumps when you hear that the dew points are rising? Does the report of rotation in the clouds send you to the front porch with a video camera rather than to the basement? Well, my friend, you are obviously a weather “junkie” and prime material to develop into a professional-volunteer storm spotter!

Seriously, all of us have some type of primal urge to “see” what the weather is doing, but not all of us are ready to dedicate our waking (and non-waking) hours to being a storm spotter. Butler County storm spotters are extremely dedicated and committed individuals who not only have a love of weather, but care deeply about the safety and welfare of the citizens in our communities.

This booklet will help to give you an overview of what we expect from you and what you can expect from us.



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Mission Statement

“Weather spotters must be trained and dependable, willing to leave their homes and families at a time of heightened risk to their community.”

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VOLUNTEER JOB DESCRIPTION – STORM SPOTTER

Purpose: To assist the Department of Emergency Management, Butler County, KS during severe weather by means of ground relay of weather information to the Emergency Operations Center (EOC). This will be accomplished by combining visual weather conditions with the EOC radar operations. The result of these efforts will be a greater level of awareness and warning to the residents of Butler County and a decrease in the potential number of injuries and deaths.

Key Responsibilities:

1. Available with short notice to either move to a designated location to transmit weather conditions to the EOC, or to remain in a stationary setting to transmit weather conditions.
2. Clear, concise verbal communications abilities.
3. Provide support at the EOC, if requested.
4. Other duties as assigned.

Qualifications/Responsibilities:

1. Attendance at an Emergency Management and/or National Weather Service-sponsored weather spotter training class once per year.
2. Attendance at a National Weather Service Advanced Spotter class when they are made available
3. Valid driver's license.
4. Attendance at a Kansas Division of Emergency Management training session (minimum 1 per year) *or* completion of a Butler County Emergency Management or FEMA home study course or CERT training class
5. Maintain current address/telephone number with Emergency Management.

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WHAT IS A STORM SPOTTER?

The key to a successful warning system are weather spotters who make the difference between anticipating and reacting to hazardous weather.

A spotter observes and reports all types of hazardous weather such as:

- Tornadoes – observers provide real-time ground truth verification and tracking information.
- Large hail – observers provide size, coverage, location and damage reports.
- Wind – observers provide wind speed and damage reports.
- Flash flood – observers give life-saving warning lead-time.
- River flood – observers provide critical information on water levels, dam and levee conditions and inundation areas during riverine flooding.

TYPES OF WEATHER SPOTTERS

1. Mobile Spotters

Mobile weather spotters use portable communications and equipment to travel and observe weather.

2. Fixed Spotters

Fixed spotters observe weather conditions from a specific site.

3. Other

Emergency Management, in cooperation with the National Weather Service – Wichita, has distributed NWS approved rain gauges throughout Butler County in strategic areas. These gauges are read and maintained by several of our weather spotters.

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WHAT TO REPORT TO THE EOC

During severe weather, things can happen very quickly. That is why it is vital that all conversation with the EOC either by amateur or public safety radio or telephone be accurate, brief, and to the point.

Report the following to the EOC:

- Tornado, funnel, wall cloud
- Hail $\frac{3}{4}$ " or larger (dime size, pea size, quarter, etc.)
- Winds *greater* than 55 mph
- Rain *greater* than 1" per hour
- Water over the roadways or roads impassable due to high water

When making a report, you should include the following information:

- (1) WHO you are.
- (2) WHERE the event is occurring (use major landmarks, distance from cities, state or local highways).
- (3) WHAT you have seen.
- (4) MOVEMENT of the event. When estimating movement, don't use the motion of small cloud elements for estimation. Instead, observe the storm as a whole for estimates of motion.

Tips for Determining Wind Speed:

MPH	
25-31	Large branches in motion, whistling wires
32-38	Whole trees in motion
39-54	Twigs break off trees
55-72	Damage to chimney or TV antenna, shallow rooted trees become uprooted, limbs the size of your wrist break off trees
73-112	Surfaces peel off roofs, windows break, light trailer homes pushed or overturned
113-157	Roofs torn off, trees uprooted
154>	Severe damage, cars lifted

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Tips for Determining Hail Size:

Pea	-	1/4"	Golfball	-	1 3/4"
Penny	-	3/4"	Tennis Ball	-	2 1/2"
Quarter	-	1"	Baseball	-	2 3/4"
Half Dollar	-	1 1/4"	Grapefruit	-	4"

WHAT NOT TO REPORT TO THE EOC!!

- Heavy rain (How much does it weigh?)
- Lightning (unless you or someone else or a house or building has been hit)
- "The wind is really blowin' here!" (The wind always blows in Kansas. Define "wind")
- "Hi. This is Fred. What is the weather going to do?" (We do *not* predict the weather. We only tell you what is happening now.)

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HOW WILL I KNOW WHEN AND WHERE TO GO?

Paging Capabilities

Butler County Emergency Management has distributed a number of alpha-numeric pagers to our Storm Spotter network. These pagers have a group “cap” code in them that is tied to a private vendor who provides automatic pages for weather Watch and Warnings for Sedgwick and Butler Counties.

Preliminary Alert:

The first indication of the potential for severe weather usually begins either early in the day or around lunchtime with a notification from the National Weather Service – Wichita. This notification comes in the way of a “Hazardous Weather Outlook” which is located on the NOAA website <http://www.crh.noaa.gov/ict/hwo/hwo.php> and monitored by the EOC. If, in the opinion of the EOC, the possibility that storm spotters may be needed, the EOC will send the information out over the alpha-numeric pagers that are carried by some of our volunteers. These “pre-alerts” are for two purposes: (1) to give a heads up to our weather spotters that they may be needed and, (2) to give the EOC some idea of how many spotters will be available.

Watches:

The NWS – Wichita or the Storm Prediction Center will issue a *Watch* indication when the atmospheric conditions indicate the potential for a severe weather event. Watches are generally sent via teletype to the Butler County Communications Center as well as over NOAA Weather Radio. The Communications Center will notify Emergency Management, via tone alert pager that a Watch has been issued.

There are, however, times when the weather breaks very quickly. There are many instances when our county has gone directly into a “warning” situation even though no “watch” has been issued.

Activation of the EOC

The EOC will be activated (24 hours a day/7days a week) as soon as the Emergency Management Duty Officer determines that a potential threat exists and spotters may need to be activated. Emergency Management volunteers are welcome to check in with the EOC by telephone (316-733-9796 or 1-800-314-3503) to find out if they are going to be needed in the field or at the EOC. ***DO NOT COME INTO THE EOC WITHOUT THE DIRECT REQUEST OF THE EM DUTY OFFICER!***

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Placement of Spotters

Mobile Spotters:

Severe weather that is approaching the county is monitored by the EOC. If, in the opinion of the Duty Officer, a system is likely to present a threat to our county, trained weather spotters will be sent to watch the system as it approaches.

Butler County spotters are not routinely sent out to spot weather. Due to the high number of trained weather spotters across the county (including law enforcement and fire), a system is usually “handed off” from one area to another. For instance, a system approaching the county from Harvey County and moving east will be “met” by spotters in that area who track its movements and effects. They will then hand off the system to Fire District #10 (Burns Fire) as it tracks further east. Fire District #10 will then hand it off to Cassoday spotters who will “escort” the system out of the county. Should it be necessary to follow a system through the county, the decision will be made by the EMA Duty Officer.

If the EM Duty Officer requests personnel to report to the EOC, then two personnel at a time will be sent to specific locations by the EMA Duty Officer in one of the two EM vehicles.

Stationary Spotters

The EM Duty Officer will take into consideration the safety of the spotters and the severity of the particular system in order to decide if it would be just as beneficial *not* to send anyone out in the field. Spotters who are at their homes or at work will make reports via telephone or radio to the EOC.

Butler County does not utilize storm “chasers”!

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THE “DO NOT’S” FOR WEATHER SPOTTERS

As with everything in life, there are “do’s” and “do not’s” for our weather spotters. We have pretty well covered the “do’s” so far so it is only practical that we cover some of the “do not’s.”

- DO NOT = Exceed the normal speed limits or drive recklessly when responding either to the EOC or to a location for weather spotting.
- DO NOT = If you are parked, watching a system, put yourself or others in harm’s way by parking in such a way that would make you a traffic hazard. Make sure you are well off the road.
- DO NOT = Stand outside of your vehicle, with a radio or microphone in your hand, when it is lightning (see Safety First Section).
- DO NOT = Ever, ever, try to talk yourself out of a traffic situation with Law Enforcement by stating you are with the National Weather Service or on a “mission from Emergency Management”. This will be the quickest way to become an ex-volunteer we know of.

USE OF PERSONAL VEHICLES (POV)

A lot (okay, most) of our volunteers and storm spotters use their POV’s for spotting. Just in case you don’t want to have a finish that resembles the surface of the moon, you need to know the following:

- Butler County does not provide car insurance for its spotters or their vehicles. (Keep repeating to yourself, “I do this because I love it.”)
- Storm spotters may utilize a flashing amber light on their vehicles for use while parked. This will enhance their visibility to other traffic during the times they are pulled over watching a storm.
- Red and/or blue flashing lights are for emergency vehicles only and may not be used by our volunteers. No sirens, either!

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SAFETY FIRST!

Safety should be first and foremost on the mind of a weather spotter. Remember that we value your safety more than we do your observations.

When spotting, travel in pairs if at all possible. This allows the driver to remain focused on driving while the passenger handles communications. When stopped, two pairs of eyes are available for spotting.

Thunderstorms

Keep aware of the local environment at all times. When in the vicinity of a thunderstorm, keep a 2-mile “buffer zone” between you and the storm. Check the sky overhead and behind every so often to ensure no unexpected event such as a tornado is developing. Have an escape route ready.

Lightning

Lightning is the biggest weather hazard facing the spotter. When in the field and when possible, remain in your vehicle to minimize the chance of being struck by lightning. If you must leave your vehicle, crouch as low as possible to make yourself a less-favorable target.

Hail

A vehicle will usually offer adequate protection from moderate-sized hailstones. Hail larger than golfball size may damage windshields, so avoid large hailshafts if at all possible.

Flash floods

When spotting in a flash flood situation, follow these common sense safety tips. Remember that flash flooding is most dangerous at night when the effects of flash flooding are difficult to see. Avoid low water crossings and don't drive into areas where the water covers the road. If you are caught in a flash flood situation, abandon your vehicle and quickly get to higher ground.

Tornado

Drive away from a tornado IF you are in open country, IF the location and motion of the tornado are known, and IF you are familiar with the local roads.

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Storm Spotting at Night

Spotting at night is obviously more difficult than spotting during the day. There are only a few allies to help you when night spotting. If possible use the light from lightning flashes to illuminate the important parts of the storm. If you are in large hail, the most dangerous part of the storm is near you and will probably move overhead within a few minutes. If you hear a loud roaring sound, then a tornado may be very close to your location. Use this tip with caution. Not all tornadoes have a loud roar, and some non-tornadic winds may also possess a loud roar.

Finally, if you think there is a tornado not far from your location (i.e. within spotting range), search along the horizon for bright flashes of light as the tornado destroys power lines and transformers.

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Butler County Emergency Management Spotter Roster:

Administrative Staff:

Jim Schmidt, Director
Charlene Miller, Asst. Director
Keri Korthals, Admin Asst.

Leon Area

John Jones
John Mellies
Kevin Worrell

Whitewater Area

Marc Wendt

Andover Area

Jim Shaver
Bob Pippin
Mike Roosevelt
Gary Elliott
Vic Guerrie
Stan Weir

Towanda Area

Bob Broyles

Augusta Area

Ray Marbut
Tyler Brewer

Benton Area

Charles Hefton
Rex Stephens
Bob Pippin

Cassoday Area

Greg Ball
Cheryl Ball
Don Rommelfanger
Kathy Snyder

Douglass Area

John Ford

Burns Area

Barry & Shelly Black
Terry Lowmaster
Cory Miller

Rose Hill

Dan Armstrong
Melvin Linot
Judd Gifford
Bob Sage
Phil Wright

El Dorado Area

Ken Nakaten
Steve Storm
Don Smith
Louis McCluer
Dan Bayliff

Sheriff

Craig Murphy

Rosalia

Dean Bender
Jack Bender

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GLOSSARY OF WEATHER TERMS

FLOOD TERMS:

Bankful – The maximum height of the river before it overflows its banks.

Flash Flood - A flood that occurs suddenly during or shortly following heavy rains or from a sudden release of water as in a dam break. Small streams and creeks usually react the fastest to heavy rains and rise several feet in hours or even minutes.

Flood Crest – The highest level a river reaches during a flood event.

Flood Stage – The height of a river at which property damage begins to occur. Usually differs from bankful. The river may overflow its banks into flood plain without reaching flood stage.

River Flood – A flood on a large river takes a tremendous amount of rain and usually develops over a period of 1-2 days. Rain water first runs into small streams that flow into the larger tributaries and eventually end up in the main stem of the river.

Urban Flood – Rapid runoff and poor drainage can lead to flooded roadways and underpasses and even become deadly.

THUNDERSTORM TERMS:

Anvil – The spreading out (by strong winds) of the upper portion of the thunderstorm. It usually has a fibrous or smooth appearance. With long-lasting thunderstorms, the anvil may spread 100 miles or more downwind.

Convection – The transfer of heat or other atmospheric properties by mass motion within the atmosphere directed in an upward motion.

Cumulus Cloud – A cauliflower-shaped cloud with a flat base and sharp edges.

Downburst – A sudden rush of cool air toward ground that can impact with speeds more than 70 mph and produce damage similar to that of a tornado. It usually occurs near the leading edge of the storm or may occur in heavy rain.

Downdraft – A column of cool air that sinks toward the ground. It is most often accompanied by rain.

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Flanking Line – A line of cumulus clouds connected and extending outward from the most active portion of a parent cumulonimbus, usually found on the southwest quadrant side of a storm. The cloud line usually has a rough stair-step appearance with the taller clouds adjacent to the parent clouds. It is most frequently associated with strong or severe thunderstorms.

Funnel Cloud – A funnel-shaped cloud extending from beneath the base of a towering cumulus or thunderstorm. It is associated with a rotating column of air that has not touched the ground, yet.

Gust Front – The leading edge of the thunderstorm's downdraft of air as it spreads out away from the storm. It is usually felt as a change to gusty cool winds and often precedes the thunderstorm's rain by several minutes.

Hail – Precipitation in the form of balls or clumps of ice.

Hook Echo – A radar pattern sometimes observed in the southwest quadrant of a tornadic thunderstorm.

Macroburst – A larger downburst affecting an area greater than 2 miles in diameter.

Mammatus – Clouds that appear to be hanging, rounded protuberances or pouches on the underside of a larger cloud. With thunderstorms, they are seen under the anvil.

Microburst – A small downburst affecting an area less than 2 miles in diameter.

Precipitation Shaft – A visible column of rain or hail falling from the base of a cloud.

Rain-free Base – The dark underside of a cloud (its base) that has no visible precipitation falling from it. This marks the updraft of a thunderstorm.

Roll Cloud – On rare occasions, a shelf cloud may turn into a roll cloud. The cloud takes on the shape of a horizontal tube that appears to be rolling. It is detached from the thunderstorm on its leading edge.

Scud Clouds – Low cloud fragments often seen in association with and behind thunderstorm gust fronts or in association with the updraft. These clouds are ragged and wind torn and are not usually attached to the thunderstorm.

Severe Thunderstorm – A thunderstorm producing damaging winds or winds greater than 58 mph and/or hail one inch in diameter or greater.

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Shelf Cloud – A low-level, wedge-shaped cloud attached to the thunderstorm. It forms above the gust front as warm air ahead of the storm.

Squall Line – A solid line or band of active thunderstorms.

Thunderstorm (Cumulonimbus) – The weather event of rain and lightning. The storm may extend 5-10 miles high into the atmosphere and 5-25 miles across. Heavy rains and gusty winds often accompany the storms.

Tornado – A violently rotating column of air ***in contact with the ground.***

Towering Cumulus – A cumulus cloud that continues to grow so that its height is taller than or equal to its width.

Updraft – Warm, moist rising air.

Wall Cloud – The cloud appears as an abrupt lowering from the relatively flat rain-free base. It is attached to a thunderstorm and may be rotating. This is the portion of the thunderstorm from which the tornado usually descends.

WINTER WEATHER TERMS:

Blizzard – Strong winds (sustained at greater than 35 mph) and heavy or blowing snow combine to produce very poor visibility and dangerous conditions.

Blowing Snow – Wind-driven snow that causes reduced visibility and sometimes significant drifting.

Drifting Snow – Winds are strong enough to blow falling snow or loose snow on the ground into mounds causing uneven snow depths.

Freeze – Used when temperatures at or near the surface (ground) are expected to be 32 degrees Fahrenheit or below.

Freezing Drizzle – Drizzle that falls onto a surface with a temperature below freezing, causing it to freeze to the surface forming a thin coating of ice.

Freezing Rain – Rain that falls onto a surface with a temperature below freezing, causing it to freeze to the surface, forming a coating of ice or glaze.

Frost – The formation of ice crystals that develop under conditions similar to dew, except that the minimum temperature has dropped to at least 32 degrees Fahrenheit.

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Frost Bite – Frozen body tissue.

Heavy Snow – Snow accumulating to at least 4 inches in 12 hours or 6 inches in 24 hours.

Hypothermia – When the body temperature drops below 95 degrees Fahrenheit.

Ice Storm – Significant and possibly damaging accumulations of ice associated with freezing rain situations.

Sleet – Ice pellets or granules of frozen rain. Sleet usually bounces when it hits a surface and does not stick, but can accumulate on roadways causing a hazard.

Snow – A steady fall of snow for several hours or more.

Snow flurries – Light snow falling for short durations.

Snow Showers – Snow falling at varying intensities for brief time periods.

Wind Chill (Wind chill factor) – Combines the rate of heat loss caused by wind and lowering temperature.