

# SKYWARN Operations Plan

## **1. Introduction**

The National Weather Service Support Plan for Tippecanoe County ARES (OP PLAN 100), short-titled “SKYWARN Operations Plan”, follows national and state agreements to provide support to the National Weather Service (NWS). Tippecanoe County ARES is tasked with the responsibility of coordinating and conducting network operations in support of the SKYWARN spotter program and relaying vital weather information to the appropriate local NWS office in near real-time. This data is used to quickly identify severe weather events and assists the NWS in determining if and when new severe weather warnings should be issued.

The NWS office in Indianapolis has warning responsibility for 39 counties in central Indiana, including Tippecanoe, Warren, Fountain, Montgomery, Boone, Clinton, Carroll, Howard, Tipton, Hamilton, Madison, Hancock, Marion, Hendricks, Putnam, Parke, and Vermillion. Warnings for Cass, White, Miami, Grant, Wabash, Fulton, and Pulaski counties originate from the Northern Indiana NWS office, while Benton, Newton, and Jasper counties are covered by the NWS in Chicago.

## **2. Overview**

The NWS administers a program to train “spotters” to identify weather conditions critical to providing real-time information that forecasters use in times of potentially severe weather. Spotters are to report those weather conditions to the local NWS office.

An informational net may be activated by Tippecanoe County ARES as a prelude to formal activation by the NWS. During this time, available spotters may be asked to check into the net to allow the NWS to identify where they are located, should the NWS request activation. This net also permits spotters to quickly report any severe weather conditions prior to a warning, should they occur.

Normally, the NWS requests spotter activation through NOAA Weather Radio broadcasts and Internet data distribution. The warning forecast offices transmit information about expected and actual activations. When the Central Indiana SKYWARN net is activated, it relays spotter reports from local SKYWARN nets in the Indianapolis County Warning Area (CWA) to the NWS office in Indianapolis. An operator often responds to the NWS forecast office in Indianapolis to staff an amateur radio station located there. A linked repeater system is also normally activated to request and receive reports from local SKYWARN nets in the Indianapolis CWA.

## **3. Related Publications / Information**

NET 1-1      Net Management (Net Control Station Procedures)

NET 1-2      Net Operations

NET 1-3      Net Frequencies

NET 1-4      Net Formats

<http://www.crh.noaa.gov/ind/spotter.php> (NWS Indianapolis Spotter Information Page)

## **4. Definition of Terms**

<b>ANCS</b>	Alternate Net Control Station
<b>ARES</b>	Amateur Radio Emergency Service (ARES® and Amateur Radio Emergency Service® are registered service marks of the American Radio Relay League.)
<b>CWA</b>	County Warning Area (area of warning responsibility for each NWS office)
<b>Downburst</b>	A strong downdraft with an outrush of damaging wind on or near the ground
<b>EAS</b>	Emergency Alert System
<b>Funnel Cloud</b>	Rotating, funnel-shaped cloud, extending downward from a thunderstorm base
<b>NCS</b>	Net Control Station
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NWS</b>	National Weather Service
<b>SOP</b>	Standard Operating Procedure
<b>TCARES</b>	Tippecanoe County ARES
<b>Tornado</b>	Funnel cloud in contact with the ground

## **5. Activation**

### 5.1 Pre-Warning Activation

Severe weather watches and warnings affecting Tippecanoe County are rebroadcast from NOAA All Hazards Weather Radio via the primary amateur radio repeater used by Tippecanoe County ARES. The issuance of a valid severe thunderstorm watch or tornado watch for the Tippecanoe County area shall automatically trigger an ARES Net Condition 4. Under most circumstances, no structured net will be initiated during a Net Condition 4. However, a non-directed, open, informational net may be activated at the discretion of the EC or an AEC of Tippecanoe County ARES. During this time, any weather conditions may be discussed, as the frequency remains open and available for general amateur use. The purpose of Net Condition 4 is merely to make everyone monitoring the frequency aware of the possibility of severe weather development.

Should the threat of potentially severe weather increase significantly during Net Condition 4, prior to a warning being issued by the NWS, ARES operations may be escalated to Net Condition 3, at which time a controlled, directed SKYWARN net would be initiated. This is normally done under a circumstance such as when a severe thunderstorm or tornado warning is issued nearby, with that storm system likely to impact the Tippecanoe County area within a relatively short period of time. This move to Net Condition 3 is made at the direction of the EC or an AEC. This escalation may also occur prior to a warning being issued, as the result of a request by the NWS for severe weather net activation in the Tippecanoe County area.

During a Net Condition 3, available spotters may be asked to check into the net to allow the NCS to identify where they are located. This net condition also permits spotters to quickly report any severe weather conditions prior to a warning, should they occur.

Under Net Condition 3, the NCS will proceed with the assignment of an Alternate NCS (ANCS) and should also assign a liaison station to relay reports from the local net to the appropriate NWS office through the linked repeater network, telephone, or Internet.

## 5.2 Warning Activation

Activation of Tippecanoe County ARES Net Condition 2 will commence immediately upon notification that the NWS has issued (or is in the process of issuing) a severe thunderstorm warning or a tornado warning for the Tippecanoe County area. Authenticated methods for receiving warnings include: NOAA All Hazards Radio, broadcast media, official EAS circuits, validated NWS Internet data, relay from NWS via amateur radio, or other verifiable means.

Activation of the Tippecanoe County SKYWARN net in response to a warning issued by the NWS will commence at ARES Net Condition 2, if a prior net is not already in progress. If Net Condition 3 or 4 has already been established, the net will immediately escalate to Net Condition 2 operation. The SKYWARN net will function as a tightly controlled, directed, tactical net.

When a severe thunderstorm warning or a tornado warning is issued for the Tippecanoe County area, a qualified Tippecanoe County ARES member, who is able to safely and effectively operate accordingly, will assume the role of Net Control Station (NCS) and immediately establish a SKYWARN net at ARES Net Condition 2 protocol on the primary operating frequency. The NCS will assign both an Alternate NCS (ANCS) and a NWS liaison station, if not previously assigned, to relay reports from the local net to the NWS office through the linked repeater network, telephone, or Internet, in order of preference. Linked repeater network frequencies that may be available from Tippecanoe County, the appropriate telephone numbers for relaying the local net's reports, and the Internet information, are provided in the Technical Data section of this document.

## **6. Deployment Locations and Required Assets**

Normal operation will be from wherever spotters and net participants are located at the time of activation, using VHF/UHF communications familiar to amateur radio operators. Mobile spotters may choose to deploy to either pre-determined or ad hoc locations.

To facilitate effective SKYWARN operations, and attempt to provide some measure of safety for mobile spotters, TCARES has designated several locations throughout Tippecanoe County and nearby areas that are suitable for mobile operators to station themselves for storm spotting activities. Each of these locations provide unobstructed views to the southwest through the north (*except when the height of crops in adjacent fields may block the view*), and an easily accessible escape route to the east and/or south for fleeing imminent severe weather threats. Details about these pre-determined locations can be found on the TCARES web site at: <http://www.W9TCA.com/spotter-locations>

### 6.1 Mobile Storm Spotting Policy of Tippecanoe County ARES (Safety Above All Else)

SKYWARN is comprised of storm spotters - **not** storm chasers. Chasing is an extremely dangerous activity, and should be left to the professionals with advanced meteorological training, the proper tools, and seasoned experience. Storm chasing cannot be learned by watching video programs that magnify its allure; storm chasing is not condoned by Tippecanoe County ARES in any form.

Even mobile storm spotting is a potentially dangerous activity. As a matter of policy, Tippecanoe County ARES does not actively deploy its members to particular locations when severe weather threatens the area. The safety of our volunteers is our top priority and we will not intentionally ask anyone to place themselves in harm's way.

However, we understand the vital need for storm spotter reports and fully support the SKYWARN program administered by the National Weather Service. Many of our members are also trained SKYWARN spotters, and Tippecanoe County ARES conducts SKYWARN nets in support of the NWS. We realize that some of our members, as well as non-ARES amateurs, will want to engage in mobile storm spotting activities during the threat of severe weather. This is a choice made entirely by the individual, and not part of official Tippecanoe County ARES operations.

Everyone who participates in mobile storm spotting should do so in a safe and responsible manner. Observe all traffic laws. Pull off roadways and intersections as far as possible (*without getting yourself stuck*) to avoid passing traffic. Do not turn off your engine; keep your vehicle running. Turn on your parking lights (headlights off) to make yourself more visible to approaching vehicles. Do not use your vehicle's emergency flashers, or other rotating or strobe lights; these create an unsafe distraction for other motorists. Advise the SKYWARN Net Control when you are en route to a designated spotter location, and specify which one. Check in with the NCS again upon your arrival, and report your status at least once every 10 minutes while there, when practical. Let the NCS know when you leave a spotter location. Mobile storm spotter communication with the SKYWARN Net Control is essential to personal safety.

## **7. Hours of Operation**

The SKYWARN net will remain in operation until released by the NWS. This typically coincides with the cancellation or expiration of watches or warnings, but may extend as long as severe weather continues to threaten the area, or at the discretion of the NWS, the EC, or an AEC. The ARES Net Condition may also be adjusted, as appropriate to the situation, at the direction of the EC or AEC.

## **8. Resources Required**

All Tippecanoe County ARES members trained by the NWS as spotters are asked to respond. VHF/UHF transceivers and associated equipment are typically used during SKYWARN operations.

## **9. Tactical Call Signs**

Tactical call signs may be used during SKYWARN operations, as assigned by the NCS. Mobile operators at pre-determined spotter locations will automatically be assigned the designator associated with those locations as their tactical call signs (i.e., "Sierra 2", "Charlie 4", etc.).

### 10. Technical Data

This section details which NWS Forecast Office has warning responsibility for Tippecanoe County and nearby counties. Each NWS Forecast Office is responsible for issuing warnings for their specific County Warning Area (CWA). Spotter reports may be collected on the SKYWARN net from counties outside of Tippecanoe. To minimize delay, severe weather reports should be relayed to the NWS office that covers the specific area in which the sighting occurred. Alternatively, any NWS office will accept severe weather reports from any location, and relay the information accordingly.



This section also specifies the amateur radio frequencies used by the NWS Liaison to establish communications with the Central Indiana SKYWARN Net for relaying of reports to the National Weather Service Forecast Office in Indianapolis, Indiana. Spotter Reporting Hotline telephone numbers for the NWS offices in Indianapolis, Northern Indiana, and Chicago are provided, along with the methods of reporting via the Internet.

10.1 **Frequencies**

Logistics: (None)  
 Agency Support: Local ARES/SKYWARN net operating frequencies  
 Health and Welfare: (None)  
 NWS Liaison: **443.775+ MHz, (88.5 Hz), KA9VXS repeater, West Lafayette**  
**146.970- MHz, (77.0 Hz), W9ICE repeater, Indianapolis**  
**442.650+ MHz, (77.0 Hz), W9ICE repeater, Indianapolis**

(Note: These repeaters may be linked together, along with others, by Central Indiana SKYWARN during severe weather nets.)

10.2 **Telephone Numbers**

NWS **Indianapolis** Spotter Reporting Hotline **1-800-499-2133** (or) **(317) 856-0359**  
 NWS **Northern Indiana** Spotter Reporting Hotline **1-888-668-3344**  
 NWS **Chicago** Spotter Reporting Hotline **1-800-681-2972**

(Note: Restricted use for SKYWARN spotter reports ONLY. Do NOT disseminate to the general public.)

10.3 Internet Reporting (Least desirable method of reporting by liaison stations)

eSpotter Online Reporting System <http://espotter.weather.gov/>

(Note: Use of eSpotter requires prior registration, and should be done long before using it for actual severe weather reporting. This will allow one to become familiar with the web site navigation and reporting system before having to make use of it to pass along time-critical information.)

Email: [w-ind.webmaster@noaa.gov](mailto:w-ind.webmaster@noaa.gov)

**USE ONLY AS A SUPPLEMENT TO REAL-TIME, 2-WAY VOICE CONTACT WITH NWS AT INDIANAPOLIS**

(Note: Email can be used to send photos of severe weather observations from the field directly to the NWS. This should be coordinated with the NWS via radio or telephone. Do NOT use email for passing of severe weather reports from spotters, unless requested by the NWS. Reports of storm damage, detailed observations made during the storm, and pictures of severe weather or damage can be sent by email after the event is over.)

## **11. Liaison Requirements**

A designated relay station, known as the NWS Liaison, shall relay reports from the local SKYWARN net to the National Weather Service Forecast Office. The preferred (primary) method shall be via amateur radio, using the linked repeater system (if available) to establish communications with the Central Indiana SKYWARN Net. If that net has not been activated, or the liaison station is unable to reliably communicate with them through the linked repeater system, the next preferred (secondary) method of contact with the NWS should be via telephone. The least desirable (and last resort) method of relaying reports to the NWS is via the Internet using the eSpotter system. While reports sent via this means are received by the NWS in a timely manner, this method does not allow for real-time, 2-way communication between the NWS and the liaison station, as do the other two methods. This can be vital to successful SKYWARN operations. Amateur radio or telephone should be the means of liaison contact with the NWS, if at all possible.

Reporting shall be limited to data requested by the NWS at that particular time, or meet minimum standards for reporting, as outlined in the Operation section of this document.

The NWS liaison station shall also relay requests for information from the NWS to the local SKYWARN net, and return any data gathered from the local net back to the NWS in a timely manner.

The point of contact for the local net's NWS Liaison is normally the NCS for the Central Indiana SKYWARN net. Central Indiana SKYWARN normally conducts net operations during periods of severe weather, and acts as the direct contact (on behalf of the NWS in Indianapolis) for the liaisons from all county severe weather net operations in their warning area.

Any station acting as NWS Liaison must be capable of simultaneously supporting both the local SKYWARN net and the Central Indiana SKYWARN net.

There should be only one amateur station from the Tippecanoe County area communicating with the NCS of the Central Indiana SKYWARN net, or the Indianapolis NWS office, during severe weather net operations. This station will be specifically appointed by the NCS of the local SKYWARN net as the NWS Liaison, and will be the sole contact for the area's amateur radio activities with the NWS during severe weather. This is by design of ARES, Central Indiana SKYWARN, and at the request of the NWS, to keep the number of stations participating at a manageable level.

All amateur stations in the Tippecanoe County area should relay their severe weather reports through the local SKYWARN net. Any other group, organization, or entity (i.e., city or county government agency, law enforcement, citizens group, etc.) should follow their own procedures for relaying their reports to the NWS. The local SKYWARN net should be ready to serve as a backup means of relaying reports for other groups, should their primary means of communication fail.

## **12. Logistics**

None.

## **13. Operation**

Once a station checks into the local SKYWARN net, or is aware that one is active, the spotter should listen and report only as defined below, unless otherwise instructed by the NCS.

### **Spotter Reporting Procedures:**

- Report severe weather observations to the net under direction from the NCS.
- Report promptly, as the storm may interrupt communications.

### **Report Briefly:**

- **WHO** you are: Your amateur radio call sign is sufficient identification. If you are relaying an eye-witness report on behalf of a non-amateur, give their full name.
- **WHAT** you have seen (be specific): tornado on the ground, funnel cloud, wall cloud,  $\frac{3}{4}$ " hail, flash flooding, etc. Report what it was doing: describe the storm's direction and speed of travel, size and intensity, and destructiveness. Include any details as needed to qualify your report, i.e., "funnel cloud; no debris visible at the surface, but too far away to see if it is on the ground."
- **WHEN** you saw it: Is it occurring now, or 5 or 15 minutes ago? Make sure you note the time of your observation, when you make it, and include that time as part of your report.
- **WHERE** you were when you saw it: What is **your** exact location? In which direction did you observe it? To avoid confusion, make sure you report **YOUR** location, and the estimated distance and direction of what you observed. Mention any specific landmarks, intersections, GPS coordinates, etc., that will help determine an accurate location of the severe weather.

### **Report:**

1. Tornadoes, funnel clouds, or rotating wall clouds
2. Hail of any size
3. Winds in excess of 40 mph (estimated or measured?)
4. Flash flooding (rain rates of over 1 inch per hour and how measured)
5. Any weather phenomena causing death or serious injury; any major storm damage
6. Other criteria as defined by the local NWS office

**NOTE:** Report actual measured diameter hail size, if at all possible. Actual measured wind speed reports are also preferred. If you are unable to precisely measure wind speeds, use the guidelines listed in the "Information for Severe Weather Spotters" brochure to help with your observation estimates. It is provided as an attachment to this document.

**Damage Reporting:**

Any damage reports requiring emergency services should be reported to 911 **by the reporting station, if at all possible**. 911 dispatchers prefer to speak directly with the person at the scene of the emergency, rather than relaying information through another party (like the NCS). If the reporting station has no immediate means of calling 911 themselves, then the NCS should act on their behalf and handle the emergency call. However, this should only be done for true emergencies, reportable through the 911 system. Situations such as power outages, downed tree limbs, stoplights not functioning, and even blocked roadways are not usually critical enough in nature to warrant a call to 911. Events such as these, unless they are also part of a more severe, life-threatening situation, should be reported through normal, day-to-day channels, by the initial reporting station if at all possible, rather than through the NCS.

**14. Deactivation**

SKYWARN net operations will be deactivated at the direction of the NWS. If significant storm damage has occurred, ARES operations may transition to provide support under the appropriate Net Condition, at the direction of the EC or AEC.

**15. Release Information**

The Tippecanoe County ARES Planning Committee, in cooperation with the National Weather Service Forecast Office in Indianapolis, Indiana, is responsible for the development and maintenance of this document.

The date of publication for this document is 31 MAR 2011.

Change log:

- 31 MAR 2011 Clarified roles and responsibilities throughout the document. Specified County Warning Area (CWA) responsibilities of the NWS offices that serve the area. Added pre-determined spotter locations to section 6, "Deployment Locations and Required Assets". Added section 6.1, "Mobile Storm Spotting Policy of Tippecanoe County ARES". Added County Warning Area (CWA) diagram to section 10, "Technical Data". Added phone numbers to other NWS offices with CWA responsibility in the region. Other updates and clarifications throughout the document. Major update.
- 08 APR 2010 Minor changes to wording in several sections of this document. No major changes.
- 03 JAN 2010 Updates to section 5.1, "Pre-Warning Activation". Removed a reference to a related Publication.

- 11 NOV 2008 Added a reference to NET 1-4, Net Formats, in section 3.
- 01 SEP 2008 Added text to section 11, "Liaison Requirements", to clarify the prioritization of methods used by the liaison station to establish communication with the NWS.
- 31 AUG 2008 Changed titles of sections 5.1 and 5.2 to more accurately reflect their content. Edited portions of section 5 to clarify procedures. Section 14 edited to remove a limiting reference. The Spotter brochure, provided by the NWS in Indianapolis, was removed as an appendix item to this document, and is now referenced as an attachment. Minor editing done in various other sections.

## **Attachment A: NWS Indianapolis Spotter Brochure**

*(Provided by the Indianapolis Office of the National Weather Service)*

## Weather To Know

Hazardous Weather **Outlook:** Local NWS seven day product identifying severe potential in the coming week.

Weather **Watch:** [www.spc.noaa.gov](http://www.spc.noaa.gov)  
A Watch is issued when conditions become favorable for severe weather. *Spotter networks may prepare to activate.*

Weather **Warning:**  
A Warning is issued when severe weather is occurring or is imminent based on National Weather Service Doppler radar or spotter reports. *Spotters report weather or damage info to NWS and local officials.*

## Receiving Weather Information

NOAA Weather Radio: [weather.gov/nwr](http://weather.gov/nwr)

Internet: [weather.gov/ind](http://weather.gov/ind), [weather.gov](http://weather.gov)  
Or your favorite local radio or television stations or favorite weather website.

Texts and pages: Many weather providers offer texts for NWS warnings including XML or RSS feeds:  
[www.weather.gov/alerts-beta](http://www.weather.gov/alerts-beta)

NWS email alerts:  
[Weather.gov/emailupdates/index.php](http://Weather.gov/emailupdates/index.php)

Facebook and Twitter: NWS IND does not have these yet but does monitor tweets:  
[weather.gov/stormreports](http://weather.gov/stormreports)

## Spotter Reporting

Some spotter groups have special reporting procedures. Contact your group leader or county Emergency Manager.

NWS phone contact (Spotters only):

**1-800-499-2133 or 317-856-0359**

Espotter web contact:  
[www.espotter.crh.noaa.gov](http://www.espotter.crh.noaa.gov)

Email reports and photos:  
[W-ind.webmaster@noaa.gov](mailto:W-ind.webmaster@noaa.gov)

## How to Report:

- ☞ **Who** you are
- ☞ **What** you observed
- ☞ **Where** the event occurred:  
Exact location; county; GPS Lat Lon
- ☞ **When** the event occurred
- ☞ **Damage** that you witnessed

## What to Report:

- ☞ Tornadoes
- ☞ Funnel clouds
- ☞ Rotating wall clouds
- ☞ Hail (any size)
- ☞ Winds (40 mph or greater)  
Estimated or measured?
- ☞ Flooding
- ☞ Any weather phenomena causing death or serious injury

# Information for Severe Weather Spotters

National Weather Service  
Indianapolis, Indiana



For more information contact:

National Weather Service  
6900 West Hanna Avenue  
Indianapolis, IN 46241  
[W-ind.webmaster@noaa.gov](mailto:W-ind.webmaster@noaa.gov)

[weather.gov/ind](http://weather.gov/ind)  
[weather.gov](http://weather.gov)

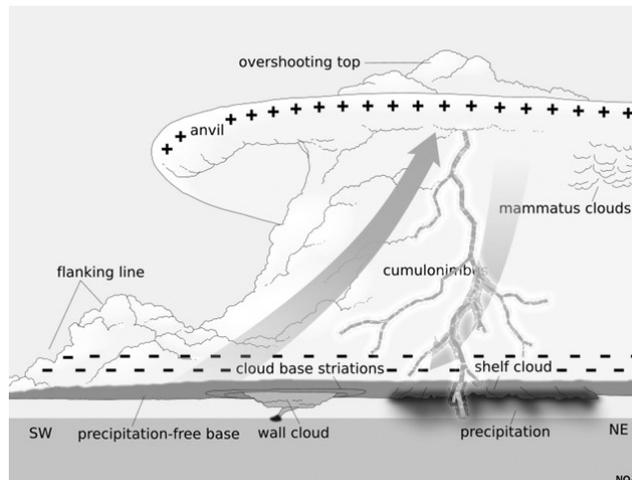
# Spotter Tips

- **Safety first:** stay out of harm's way
- **Lightning** is your most obvious threat
- **Hail:** avoid using "marbles" to describe hail size - use coins; better yet, measure it.
- **Tornadoes** often move to the northeast or southeast. Watch a radar loop to determine storm direction. The best view of the sky is at a location you can look west or northwest toward the approaching storm.
- **Squall lines** are preceded by a **shelf cloud**. Uplifting air in front of a shelf cloud can create finger-like features in the shelf that are funnel-like: beware; funnels rotate.
- **Supercells** produce forward and rear flank shelf clouds with downbursting wind of varying strength.
- Supercell updrafts, behind the forward flank rain shaft, often develop a wall cloud, the isolated lowering in the rain-free updraft cloud base.
- **Wall Clouds** are typically cylindrical and to be significant, should exhibit organized and sustained rotation about a vertical axis. The wall cloud precedes a funnel and is near the clear slot before tornado forms.
- Report accurately; a **tornado** is a violently rotating column of air in contact with the ground and causes damage. A **funnel cloud** is a violently rotating column of air not reaching the ground and not causing damage. Be observant – sometimes there is no visible connection between the cloud and the ground; if debris is spiraling upward, it's a tornado.

# Estimating Wind Speed

Most wind damage from thunderstorms is caused by straight-line winds (also known as "downbursts"). When reporting wind speed, remember to include whether the report was measured or estimated, and describe any damage. If you cannot measure the wind speed, use the table below:

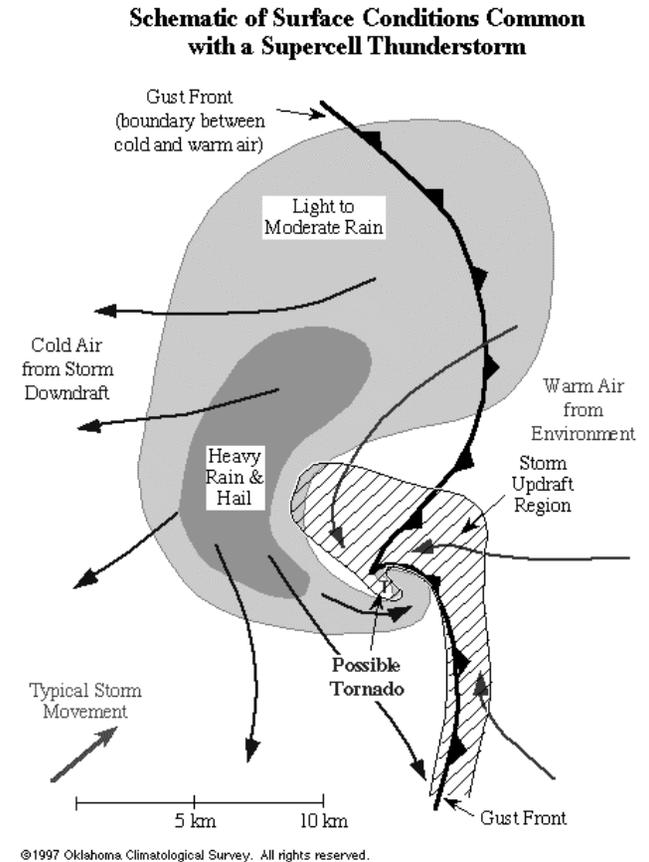
- 25-30 mph: large branches move.
- 30-40 mph: whole trees move.
- 40-45 mph: small branches break; walking impeded.
- 45-55 mph: larger branches and weak limbs may break; slight structural damage occurs.
- 55-65 mph: moderate structural and tree damage occur.
- 65 mph + : heavy to severe structural and tree damage occur.



Supercell Schematic

# Supercell Thunderstorms

Supercells are always severe, often with tornadoes, large hail, and intense straight-line winds. The best positions to view from are on the inflow side which is typically to its east or south or perhaps on its rear side as it's moving away. Always ensure you are in a safe place when viewing or have four way escape access if you are mobile.



National Weather Service Indianapolis  
<http://www.weather.gov/ind>