STORM SPOTTER'S CHECKLIST

National Weather Service - Memphis, TN

REPORTING TIPS...

- Be clear when reporting location (are you giving your location or the event's?)
- IMPACTS from heavy rainfall are more important than instantaneous rates.
- If you are unsure of what you're seeing, make your report but express the uncertainty also.
- Reports of environmental conditions (outflow, strong warm moist inflow, etc.) are important.
- Use teamwork: multiple distances and angles.

SAFETY TIPS...

- Beware of flooding and lightning.
- Spot from a fixed location when possible.
- Two people in spotter vehicles.
- ALWAYS have escape routes!
- Point spotters should have quick access to shelter.
- Mobile spotters should keep their vehicle running.

NIGHT SPOTTING TIPS...

- BE CAREFUL!
- Lightning can backlight storm features.
- Search for all environmental clues.
- Increasing hail size suggests you are close to the updraft area.
- Power flashes indicate possible damaging winds.
- Any strong wind can make a roaring sound.

SEVERE STORM CHARACTERISTICS...

- Long lifetime (more than 30 minutes)
- Organization (dominating local area)
- Strong updrafts and downdrafts
- Storm rotation

ARE STRONG UPDRAFTS PRESENT?

- ☐ Thick, sharp-edged anvil
- ☐ Large, persistent overshooting top
- ☐ Hard, cauliflower texture to updraft tower
- ☐ Moderate to strong inflow winds
- ☐ Warm, moist air blowing into storm
- ☐ Rain-free base
- ☐ Inflow bands
- ☐ Rising scud clouds (possibly)
- ☐ Wall cloud

ARE STRONG DOWNDRAFTS PRESENT?

- ☐ Shelf cloud or roll cloud
- ☐ Rain foot or Dust foot
- ☐ Intense rain area that quickly reaches ground
- ☐ Winds blowing away from storm

IS THE STORM ROTATING?

- ☐ Striations
- ☐ Barrel– or bell-shaped (flared out) updraft tower
- ☐ Rounded rain-free base
- ☐ Beaver tail
- ☐ Rotating wall cloud

IS THE TORNADO THREAT INCREASING?

- ☐ Large, circular updraft base
- ☐ Increasing spin in wall cloud and cloud base
- ☐ Strong, increasing inflow
- ☐ Rapid vertical motions near wall cloud
- ☐ Clear slot (rear flank downdraft) formation
- ☐ Small precipitation burst behind wall cloud or a thin curtain of precipitation around wall cloud
- ☐ Tornado forms in minutes or, more likely, outflow undercuts wall cloud and updraft

ARE YOU SEEING A "LOOK-ALIKE"?

- ☐ Scud (not attached to cloud base, likely not rotating)
- ☐ Precipitation shaft (likely not rotating, often has a fuzzy or stringy appearance)
- ☐ Smoke/Steam column (originates from a stationary point, likely not rotating)
- ☐ "Gustnado" (not associated with updraft, not attached to cloud base)

WALL CLOUDS vs. SHELF CLOUDS...

WALL CLOUDS

- suggest updraft
- slope upward away from the precipitation
- maintain their position with respect to the precipitation
- form under a smooth, flat updraft base

SHELF CLOUDS

- suggest downdraft
- slope downward away from the precipitation
- visibly move away from the precipitation area
- have a ragged, choppy appearance to their bases

HAIL SIZE ESTIMATION

1/4"	Pea		
1/2"	USB plug	2"	Hen Egg
3/4"	Penny	2.25"	Racquetball
7/8"	Nickel	2.5"	Tennis Ball
1"	Quarter	2.75"	Baseball
1.25"	Half Dollar	3"	Tea Cup
1.5"	Ping Pong	4"	Grapefruit
1.75"	Golf Ball	4.5"	Softball

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+----+----+----+----+----+----+----+----+
    0.5   1   1.5   2   2.5   3   3.5  4.0 inches
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SUGGESTED REPORTING CRITERIA

URGENT (tornado, flash flood)

- Tornado
- Funnel cloud
- PERSISTENT rotating wall cloud
- PERSISTENT low-level rotation signatures
- Major flooding (roads closed, water rescues)
- Storm-related damage

HIGH (non-tornadic supercell, flooding)

- Hail golf ball size or larger
- Winds 65 mph or stronger
- Persistent non-rotating wall cloud
- Flooding of uncommon areas

MEDIUM (near or above severe tstm criteria)

- Hail 3/4 inch to golf ball size
- Winds 45 to 65 mph
- Rainfall accumulation of 1/2 inch in 30 minutes
- Strong updraft or outflow signatures

LOW

- Hail smaller than 1/2 inch
- Winds less than 45 mph
- Heavy rain, no flooding impacts

WIND SPEED ESTIMATION

25-30 mph -- Large branches in motion, whistling heard in telephone wires

31-44 mph -- Whole trees in motion; inconvenience felt walking against the wind

45-54 mph -- Small branches break off of trees; difficulty walking against the wind

55-64 mph -- Damage to TV antennas and light storage buildings; breaks large tree limbs; pushes over shallow rooted trees

65-74 mph -- Damage to chimneys, shingles, siding, multiple trees uprooted,

75-112 mph -- Peels shingles/sheeting off roofs; windows broken; mobile homes pushed or overturned; moving cars pushed off of road

Beaver('s) Tail - A low cloud band with a relatively broad, flat appearance suggestive of a beaver's tail. It is attached to a supercell's updraft base and extends to the east or northeast.

Bow Echo - A bow-shaped signature on weather radar. Bow echoes suggest the presence of significant thunderstorm winds. Short-lived tornadoes can sometimes occur on the north side of a bow echo.

Derecho - A long-lived storm complex capable of producing damaging thunderstorm winds over a large area.

Downburst - A strong downdraft resulting in an outward burst of damaging winds on or near the ground. Sometimes called "straight-line winds", downbursts may be large (macroburst) or small (microburst) in scale.

Downdraft - A downward-moving column of air, often accompanied by precipitation.

Dust Foot - A plume of dust moving away from a thunderstorm precipitation area. A dust foot is a visual indication of strong outflow winds.

Flash Flood - A rapid rise of water, usually during or after a period of heavy rain. Flash floods are the leading killer among thunderstorm-related hazards.

Funnel Cloud - A condensation funnel extending from the base of a towering cumulus or cumulonimbus, associated with a rotating column of air that is *not* in contact with the ground.

Gust Front - The leading edge of gusty outflow winds from thunderstorm downdrafts; sometimes associated with a shelf cloud or roll cloud.

Gustnado - A surface-based circulation in the outflow area. Gustnadoes are not associated with updrafts and are not attached to cloud bases, so they are not considered true tornadoes.

Inflow - Winds blowing in toward a thunderstorm, usually toward the updraft area.

Inflow Bands - Bands of low clouds moving into or toward a thunderstorm. They may indicate the strength of the inflow of moist air into the storm and its potential severity.

Mammatus Clouds - Rounded, smooth, sack-like protrusions hanging from the underside of a thunderstorm anvil. Mammatus clouds often accompany severe thunderstorms, but do not produce severe weather.

Mesocyclone - A storm-scale region of rotation, typically around 2-6 miles in diameter.

Multiple-vortex Tornado - a tornado in which two or more condensation funnels or debris clouds are present, often rotating about a common center or about each other.

Outflow - Winds blowing away from a thunderstorm.

Power Flash - A blue-green flash caused by arcing electric power lines. They are often a visual indication of damaging winds.

Rain Foot - A bulge of a precipitation shaft near the ground, forming a foot-shape. It is a visual indication of strong outflow winds.

Rain-free Base - A horizontal cloud base with no visible precipitation beneath it. It typically marks the location of the thunderstorm updraft.

Rear Flank Downdraft - A region of sinking air on the back side of, and wrapping around, a mesocyclone. It often is visible as a "clear slot" or "bright slot" wrapping around the wall cloud.

Roll Cloud - A low, horizontal tube-shaped cloud associated with a thunderstorm gust front.

Scud - Small, ragged, low cloud fragments that are unattached to the main thunderstorm cloud base.

Severe Thunderstorm - A thunderstorm which produces tornadoes, hail 1 inch or larger in diameter, or winds of 50 knots (58 mph) or stronger. Structural wind damage may imply the occurrence of a severe thunderstorm.

Shelf Cloud - A low, horizontal wedge-shaped cloud associated with a thunderstorm gust front. .

Squall Line - A solid or nearly solid line or band of active thunderstorms. Squall lines typically have updraft areas on the leading edge, above or just ahead of a large gust front.

Striations - Grooves or channels in the side of a thunderstorm updraft tower. Striations often reveal the presence of rotation, as in the barber pole or "corkscrew" effect often observed with a rotating updraft.

Supercell - A thunderstorm with a persistent mesocyclone. Supercells are responsible for a high percentage of severe weather, including tornadoes, extremely large hail and damaging straight-line winds.

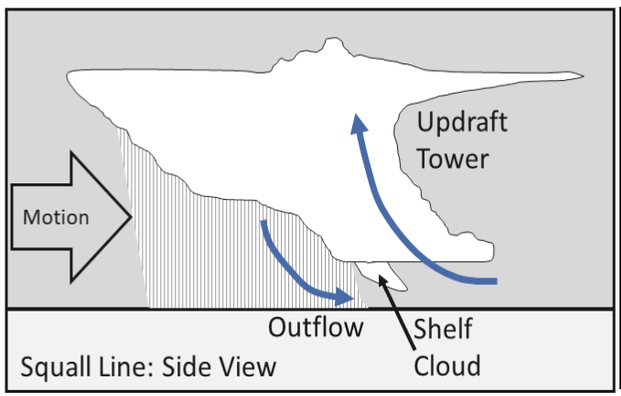
Tail Cloud - A horizontal, tail-shaped cloud (not a funnel cloud) at low levels extending from the wall cloud toward the thunderstorm's precipitation region.

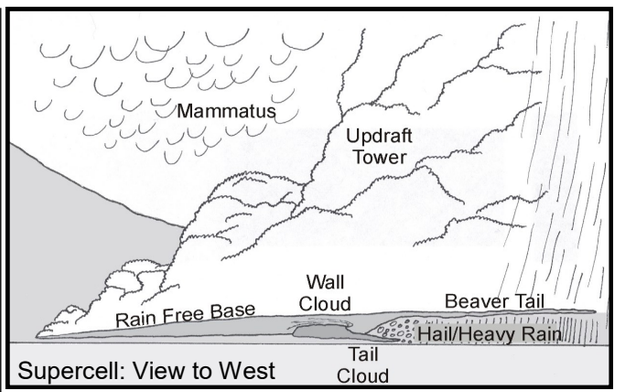
Tornado - A violently rotating column of air in contact with the ground and extending from a thunderstorm.

Updraft - A column of rising air, often associated with the active portion of a thunderstorm.

Updraft Tower - A vertical cloud tower outlining the updraft area of a thunderstorm.

Wall Cloud - A localized, persistent, often blocky or abrupt lowering from a rain-free base. Wall clouds suggest a strong updraft, and normally are found on the south side of the thunderstorm.





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(for county liaisons)