Supercell Thunderstorms

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Supercell Thunderstorms

What makes a supercell different from all other thunderstorms?

- **ROTATION**
  - Requires both speed and directional wind shear
  - Contains a mesocyclone
    - A cyclonically rotating vortex, 2-10 km in diameter, within a convective storm
  - Often a “right-mover”
    - Moves to the right of the general flow where it gets the best air and rotation is stronger

Where do Supercells Form?

Structure of a Supercell

Structure of a Supercell: Radar/Satellite

Map View of a Supercell
Structure of a Supercell

- FFD: Forward flank downdraft
- RFD: Rear flank downdraft
- UD: Updraft
- BWER: Bounded weak echo region (echo-free vault)

Updraft obstructs upper-level air flow, precipitation pattern gets split.

Three Supercell Classifications

- Low Precipitation (LP)
  - Little to no precipitation
  - Generally does not produce tornadoes
- Classic
  - Contains structure described already
- High Precipitation (HP)
  - Lots of precipitation
  - Rain-wrapped tornadoes

LP Supercell

3 May 1999 – Radar Reflectivity

Bounded Weak Echo Region (BWER) Example

The Hook Echo at low levels transitions into a weak echo in reflectivity at higher levels. This weak echo is coincident with the location of the updraft. Heavy Precipitation suspended in updraft. Large echoes on T71 where no echoes present on T71.

LP Supercell

Three Supercell Classifications
Supercells are rotating thunderstorms.

- Supercells have one rotating updraft and one or more downdrafts.
- Supercells form in environments with strong wind shear (change in speed and direction with height).
- Supercells often produce tornadoes.

The Take-Home Message About Supercells