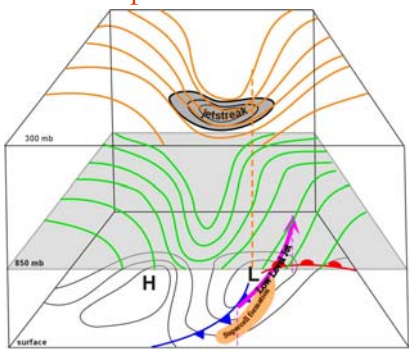
Supercell Thunderstorms

Photo: Mike Hollingshead; http://www.extremeinstability.com/

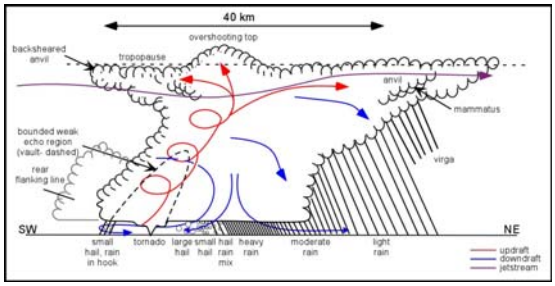
Supercell

- Rotating thunderstorm with updrafts and downdrafts structured so it can maintain itself for several hours
- 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

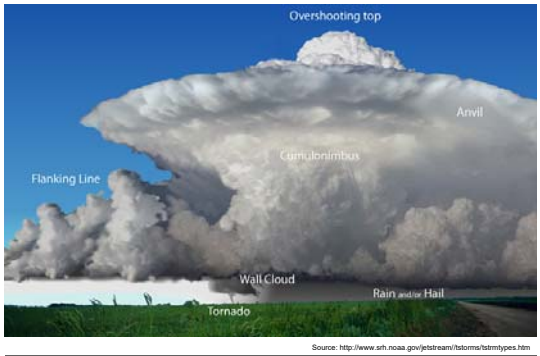
Where do Supercells Form?



Structure of a Supercell

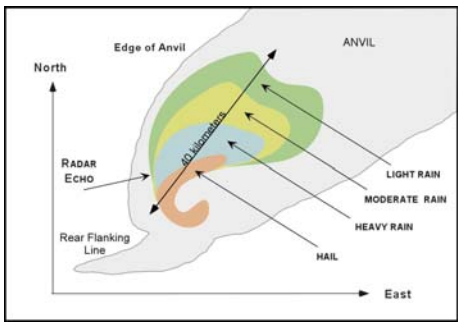


Structure of a Supercell



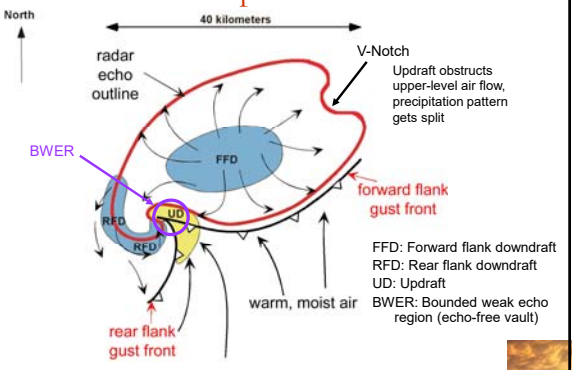
Source: http://www.srh.noaa.gov/jetstream//tstorms/tstrmtypes.htm

Structure of a Supercell: Radar/Satellite

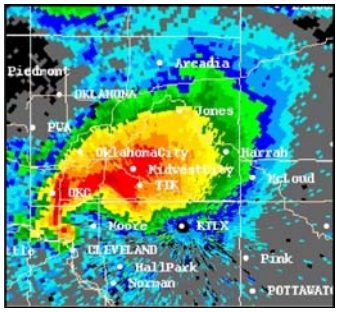


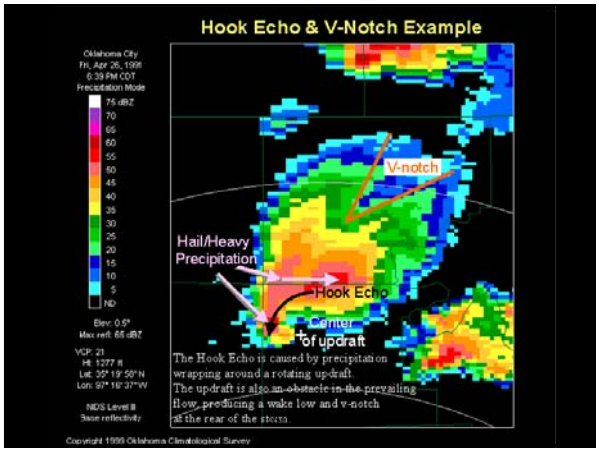
Map View of a Supercell

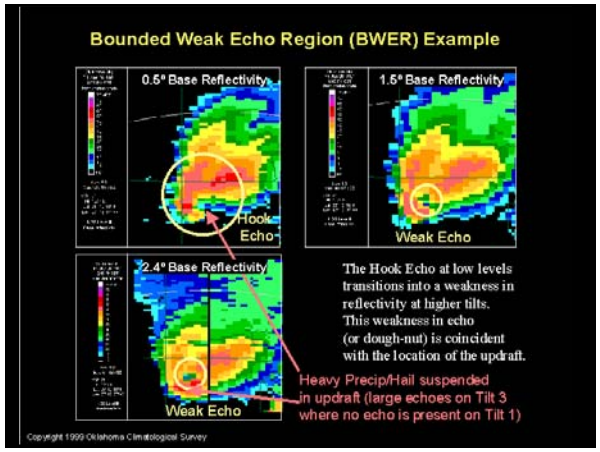
Structure of a Supercell



3 May 1999 – Radar Reflectivity







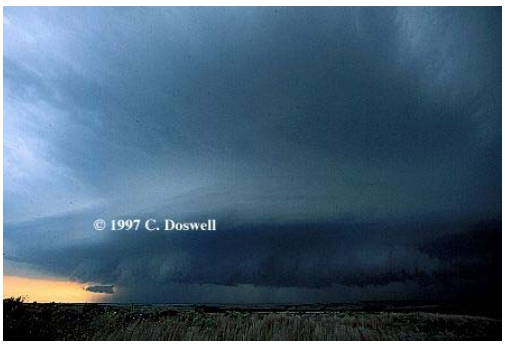
Three Supercell Classifications

- 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

Classic Supercell

HP Supercell



Mammatus Clouds

Mammatus Clouds

The Take-Home Message About Supercells

- 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