Aviation Weather Guide

THUNDERSTORMS

A thunderstorm contains upward and downward motions and is accompanied by lightning, precipitation and wind. Thunderstorms are usually too dangerous to fly over or through.

Thunderstorm Ingredients

Moisture - Sufficient water vapor content, as measured by the dew point temperature

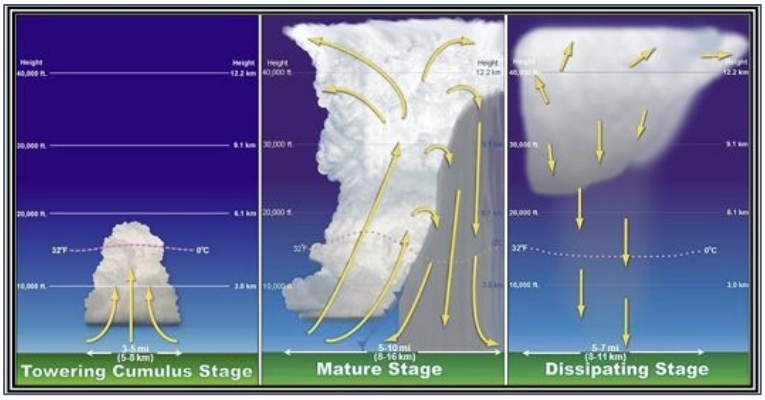
Instability - Cooling temperature with height promotes buoyant, rising air

Lift - A triggering mechanism is needed to initiate rising air. Examples: frontal and outflow boundaries, converging low-level winds, orographic upslope flow, drylines

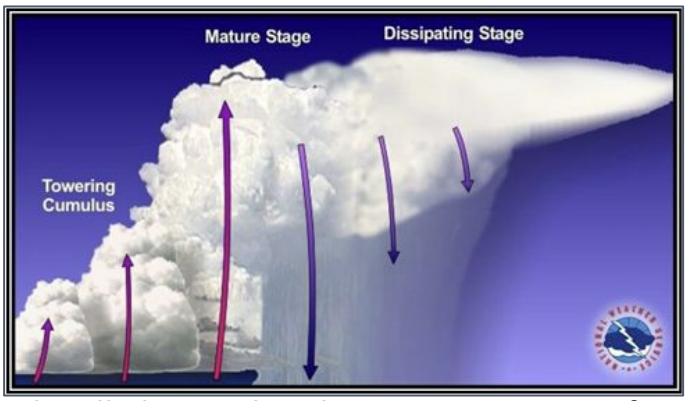
Wind Shear - Necessary for organized thunderstorms

Aircraft hail damage

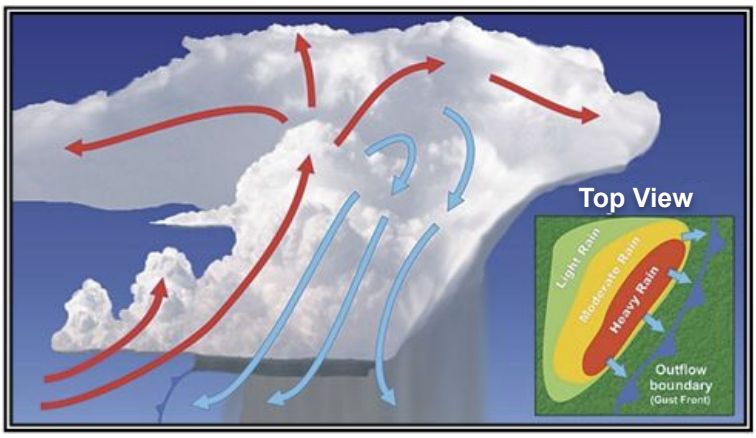
Thunderstorm Types



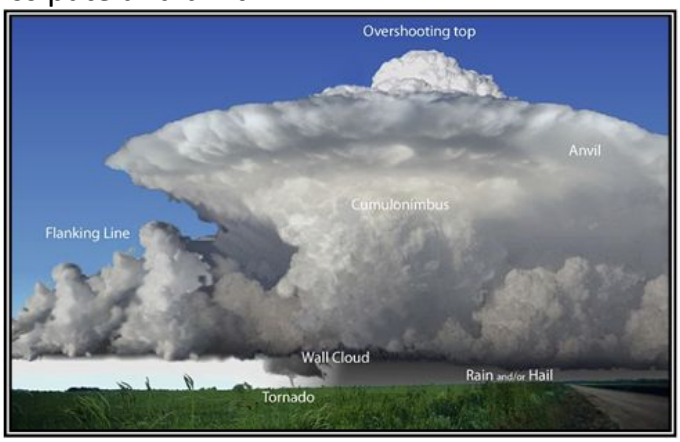
Single Cell Thunderstorm: Often develops during warm, humid summer days and consists of one updraft and one downdraft. Hail and microburst winds are possible with these storms.



Multicell Cluster Thunderstorms: Consists of a cluster of storms at various stages of their life cycle. New storms continually develop and replace the mature storms which have begun to dissipate and drift.



Multicell Line Thunderstorms: A line of storms forms into a narrow band, possibly hundreds of miles long. These lines of storms can persist for many hours and act as an air traffic barrier.



Supercell Thunderstorm: Contains a strong, rotating updraft and a strong downdraft. Can last for several hours. May produce large hail, damaging winds, and/or tornadoes.

PRE-FLIGHT (MISSION PLANNING)

- **Check the latest hourly convective SIGMETs**. Also check the previous round of convective SIGMETs.
- **Check the latest SPC convective outlooks** for general awareness of where thunderstorms may develop from 1 to 8 days in the future.
- **Check for any severe thunderstorm or tornado watches** along your route.
- **Consider adjusting departure/arrival times**. Thunderstorms are most common during the mid to late afternoon hours in the spring and summer.

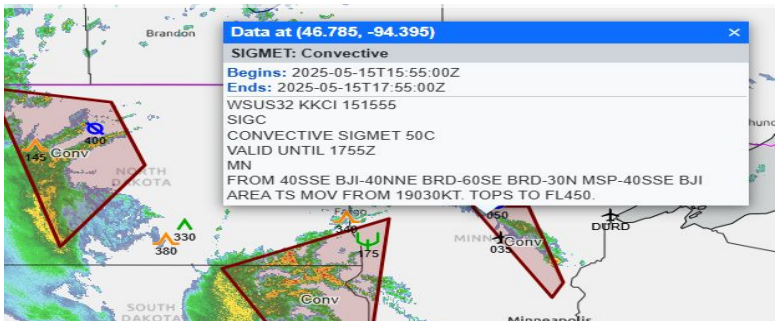
IN-FLIGHT (SITUATIONAL AWARENESS)

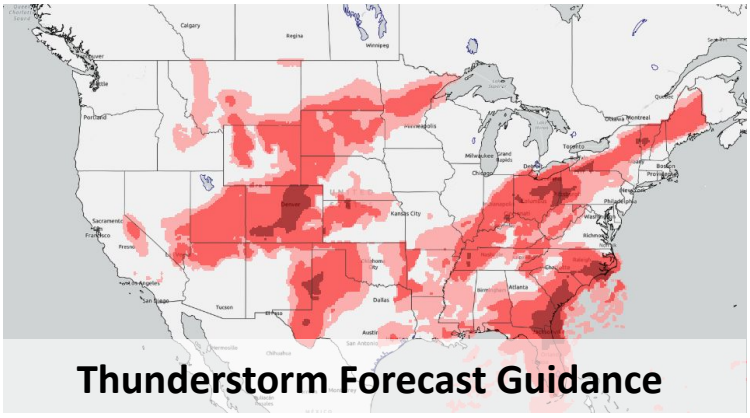
- **Do not take off or land near thunderstorms.** A gust front will likely induce low-level turbulence and could cause loss of control.
- **Do not attempt to fly under or over a thunderstorm.** Multiple severe and extreme hazards are possible above, below, and adjacent to thunderstorms.
- **Do not attempt to fly under a thunderstorm anvil.** Severe and extreme clear air turbulence is possible there. Look for anvils on satellite imagery.
- **Aviation hazards remain possible even when a storm is weakening.**
- **Do not assume that ATC will offer radar navigation guidance and/or deviations around thunderstorms.**
- **Keep in mind that data-linked radar imagery shows where the weather was, not exactly where the weather is.** Conditions change rapidly near thunderstorms. Data may be slightly older than what's currently happening.
- **Do not trust visual appearance to be a reliable indicator of hazards within and surrounding a thunderstorm.** Conditions change rapidly when thunderstorms are present. Not all hazards are visible. Heavy precipitation can significantly reduce visibility.
- **Listen to ATC communications for PIREPs and chatter of other aircraft requesting to deviate around thunderstorms or to divert.**

Impacts and recommendations source: section 22.8.2 titled “Thunderstorm Avoidance Guidance” is available at https://www.faa.gov/sites/faa.gov/files/FAA-H-8083-28A_FAA_Web.pdf

AWC Thunderstorm Warnings

(Convective SIGMET)



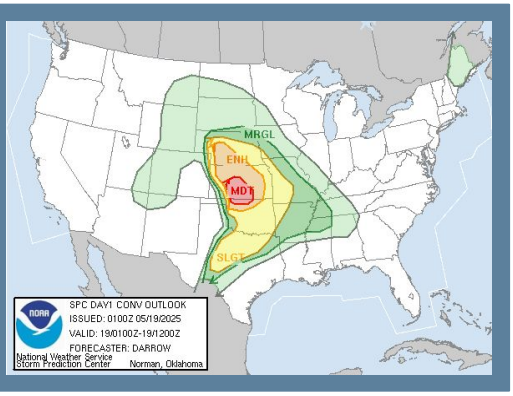


Thunderstorm Forecast Guidance

Storm Prediction Center

Convective Outlooks

SPC.NOAA.GOV



Thunderstorm Forecast resources available at:

AviationWeather.gov