Basic SKYWARN Spotter Training

Virginia Enzor NC4VA
Emergency Coordinator
Central Carolina SKYWARN

NWS Raleigh

NC State Centennial Campus
(919) 326-1042
www.weather.gov/rah

- 24 Employees, 17 Meteorologists
- 24 hours a day, 365 days a year
- One of 122 local offices

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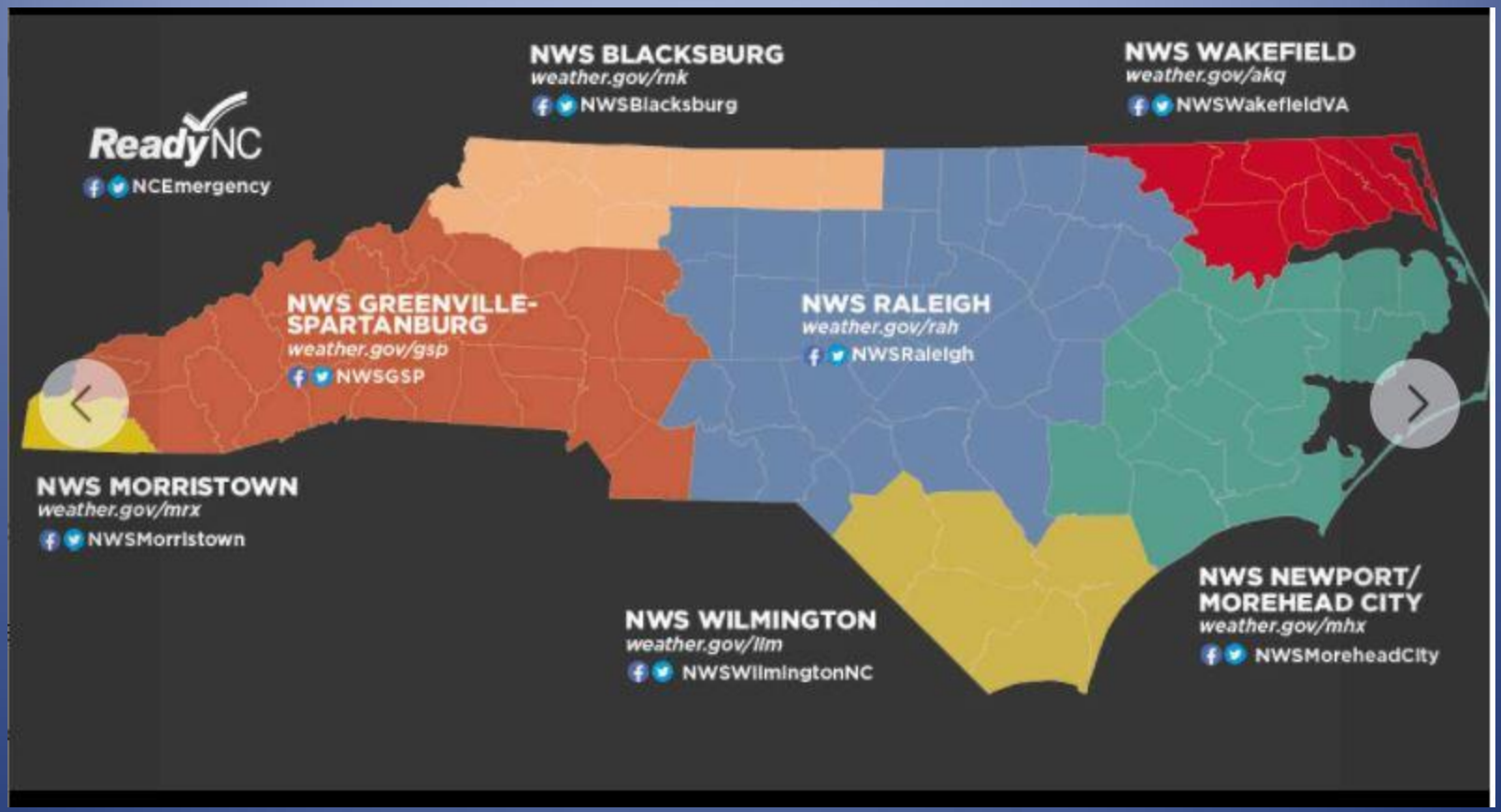
7 NWS forecast offices that serve NC



NWS Raleigh covers the 31 counties in blue

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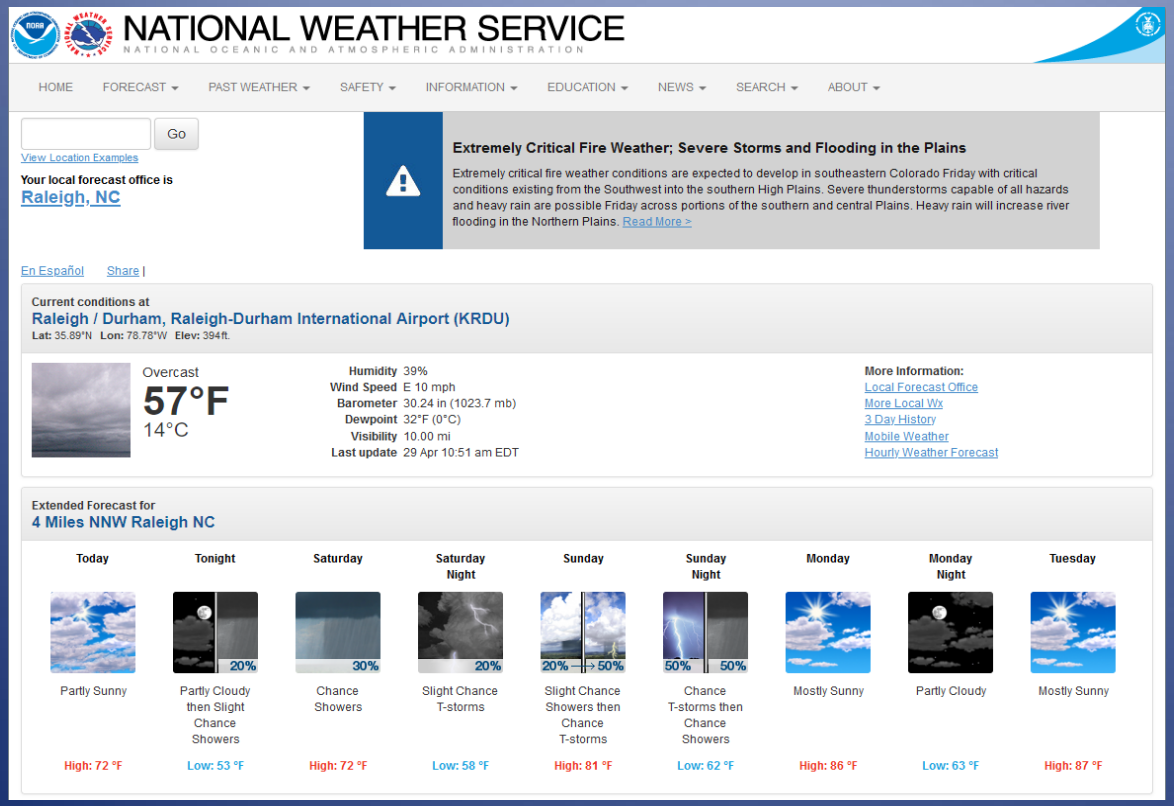
What the NWS does!

- #1 Mission: Issue hazardous weather warnings life and property
- Prepares weather forecasts
- Provide weather, radar and satellite information



NWS issues forecasts for…

- The next 7 days
- Aviation
- Marine
- Fire weather
- Climate
- Space weather
- And more…

http://weather.gov/raleigh

What is SKYWARN?

SKYWARN is a National Weather Service program in which trained volunteers provide the NWS with timely and accurate severe and hazardous weather reports.

The key focus of the SKYWARN program is to save lives and property .

Spotters differ from chasers.

Photo courtesy NOAA Photo Library

Central Carolina SKYWARN

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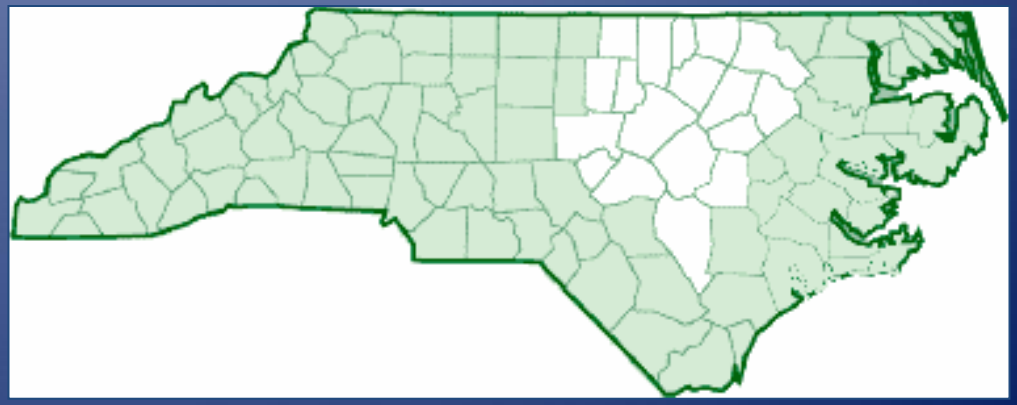
Serves the Raleigh NWS

Covers 18 counties

About 2000+ in central NC (About 25% are hams)

Over 350,000 spotters nationally



Why are spotters needed?

Technology cannot detect every incidence of hazardous weather; spotters provide ground truth information.

Spotters report how storms and other weather phenomena are impacting their area.

Spotter reports verify the warnings.

Spotter reports help forecasters make warning decisions.

Spotter reports add another layer of credibility to warnings.

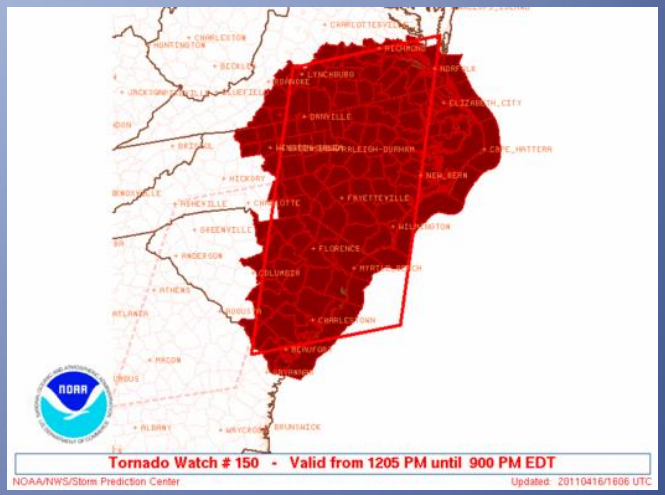
A thunderstorm is severe if it produces any of the following:

- Hail – 1" (quarter size) or larger
- Wind speeds of 58 mph or greater
- A tornado

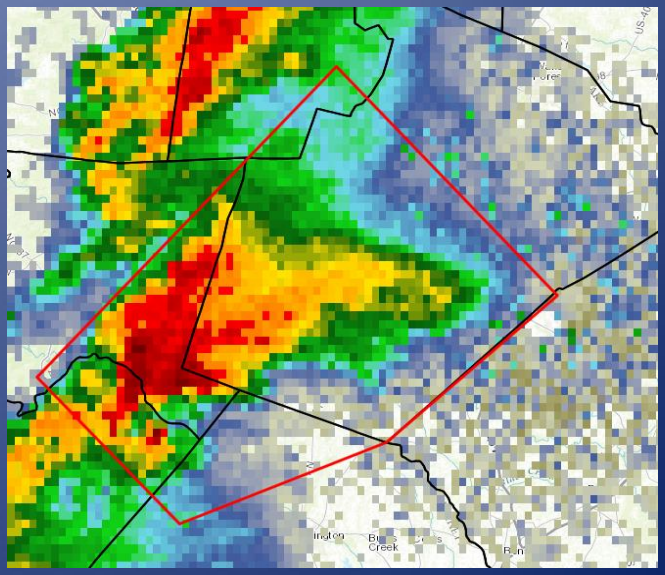
Lightning *<u>does not</u>* make a thunderstorm severe. No matter how vivid, impressive or deadly it is!

Watches Vs. Warnings

Watch: Conditions are favorable in the next several hours. Plan, prepare, and be aware.



Warning: Hazard is imminent or occurring. Take immediate action to protect life and property.



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Report Hail

- At first, report any size hail
- At the end of the event, report the size of the largest stone and any damage.
- To estimate size, compare hail to well-known objects such as coins or balls or measure the hail with a ruler

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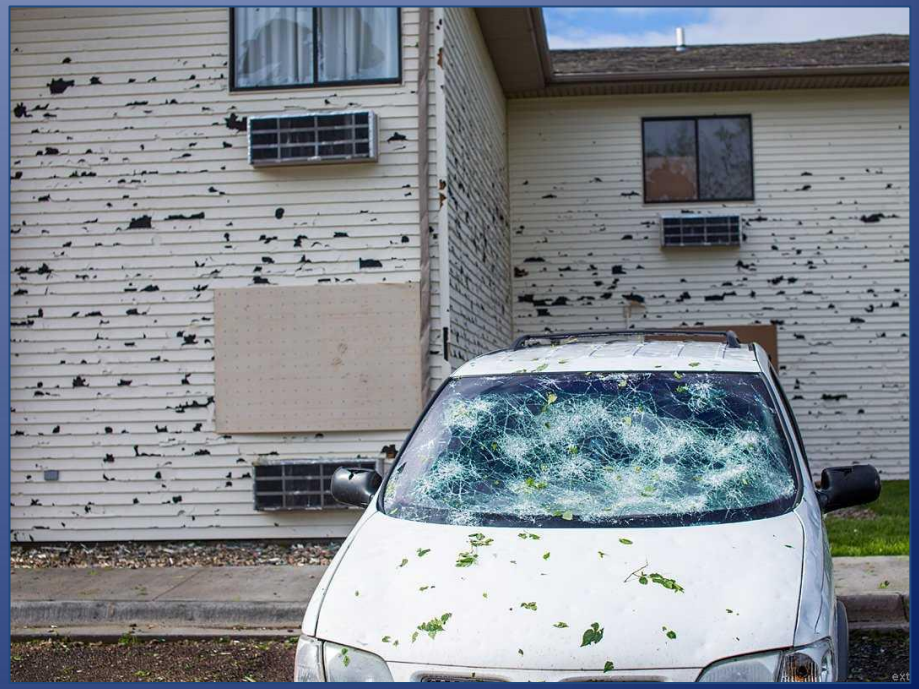
Hail causes $1 billion in damage to crops and property annually!

Photo courtesy /www.nc-climate.ncsu.edu



Report estimated or measured wind speeds of 50 mph or greater; measured is preferred.

Photo courtesy of Cassie Mentha

25-31 mph – large branches in motion

32-38 mph – whole trees in motion

39-54 mph – twigs break off, wind impedes walking

55-72 mph – damage to chimneys and TV antennas, large branches broken, some trees uprooted

73-112 mph – removes shingles, windows broken, trailer houses overturned, trees uprooted

113+ mph – roofs torn off, weak buildings and trailer houses destroyed, large trees uprooted

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Report:

- Flooding or flash flooding where none normally occurs
- Flooded roadways, rivers and streams, giving approximate water depth.
- Are the flood waters standing or flowing?
- Is the flooding rising, staying steady or falling?
- Are cars stalled in flood waters?
- Any damage from the flooding or mud slides?

(Do not report ponding. Report flooding when water is over the curb or 6” deep.)

Photo courtesy Raleigh NWS

Report:

Rotating wall clouds, funnel clouds, or tornadoes

NOAA Photo Library

NOAA Photo Library

"If it doesn't spin, don't report it in."

Funnel cloud

National Weather Service Forecase Office, San Antonio, TX NOAA Central Library

NOAA Photo Library

Questions spotters may be asked

Is it rotating?

How far beneath the cloud base does the funnel cloud extend?

Is there any visible debris swirling at the ground (includes dust, leaves, or other debris)?

Can you see any damage or are there any injuries?

Does the funnel look like a piece of rope or a large “V”/wedge shape?

What direction is it moving?


Photo by Dale Pate

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Be aware of tornado look-a-likes!

Photo courtesy Jonathan Wall

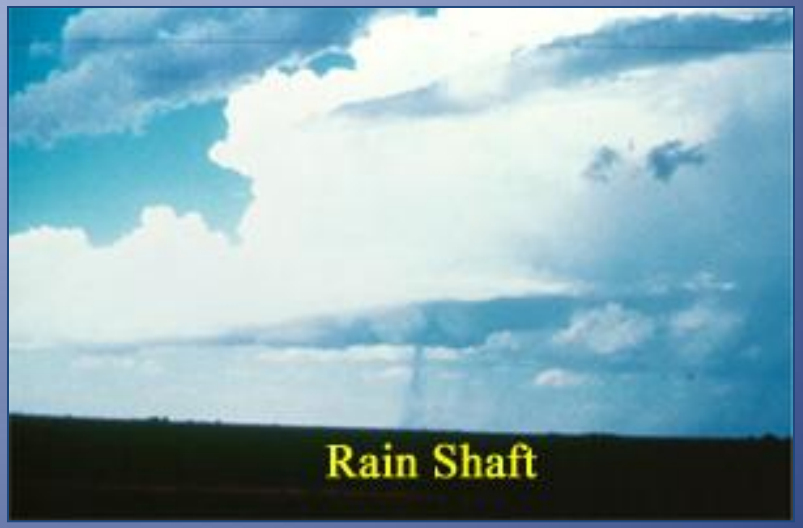

Photo from NSSL Photo Gallery; http://www.erh.noaa.gov/iln/spotters/guide/

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Always report storm damage:

Siding or roof damage

Downed limbs or trees and their approximate diameter

Downed power lines/poles

Photos courtesy (UR) Barbara Settlemyre, & (LL & LR) Raleigh NWS

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It's OK to report large tree limbs, but ***don't*** call NWS for small branches, or weak or dead trees

Do report

Don't report

What else not to report …

Lightning (unless there is damage or injury)

Personal power outage

Non-criteria reports

- “It’s raining cats and dogs.”
- “It’s getting dark to the north west.”
- “It’s really windy.”
- “There are 2 inches of water on the road.”
- “Nothing is happening here.”

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Spotter Reporting Procedures

Briefly report:

What: The event observed

Where: Location of the event (lat. & long. or street & cross street, city, county)

When: Time of the event and duration

Who: Spotter's name and contact information

Report only what you observe and hear.

Photos are great! Send to nws.raleigh@noaa.gov and post to Central Carolina SKYWARN Facebook page!

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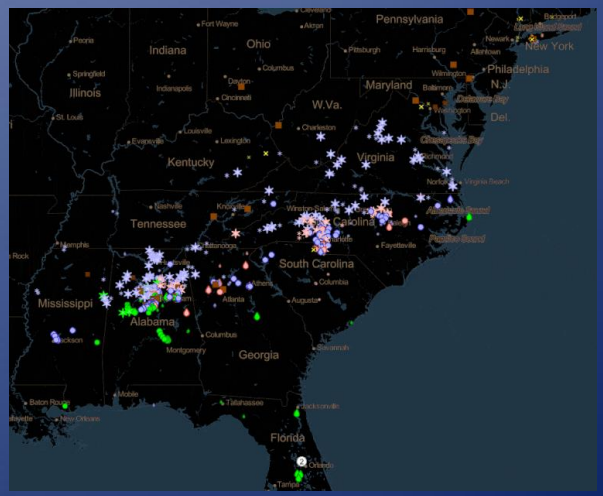
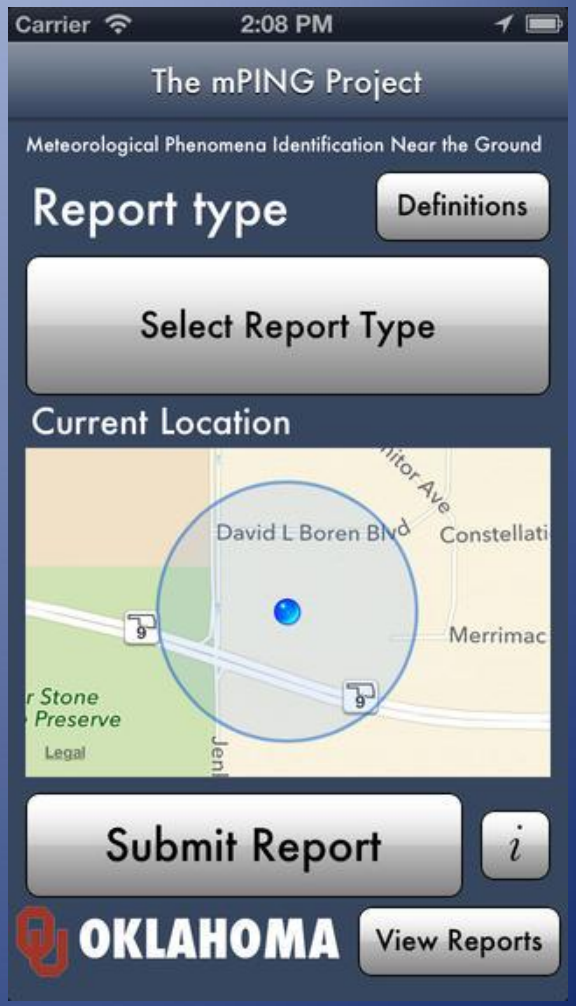
Ways to get your report to the NWS…

- Central Carolina SKYWARN Net on 145.210 repeater
- Telephone call to the NWS
- Central Carolina SKYWARN Facebook page
- Raleigh NWS Facebook page
- Raleigh NWS website weather.gov/rah
- Email to the NWSRaleigh@noaa.gov (photos)
- Twitter: @NWSRaleigh
- CoCoRaHS
- mPing



mPING

- Meteorological Phenomena Identification Near the Ground (mPING) is a project to collect weather information from the public through their smart phone or mobile device.
- Researchers will compare the reports with what radars detect and use the information to develop new radar and forecasting technologies and techniques.
- Free apps are available on iTunes and Google Play for use on both phones and tablets.



When does SKYWARN activate on the 145.210 repeater?

Severe thunderstorm watch or warning in any one of our 18 counties

Tornado watch or warning in any one of our 18 counties

Other times as directed by the Raleigh NWS

Stand by mode = non-directed net
Active mode = directed net

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Stay informed!

- NOAA Weather Radio
- Mobile.weather.gov - weather data for your smart phone
- www.weather.gov/rah
- Facebook – Raleigh NWS Facebook page & CCS Facebook Page
- Local Media – TV & Radio
- Mobile alerts - WEA
- County alerts -free
- Central Carolina SKYWARN Net

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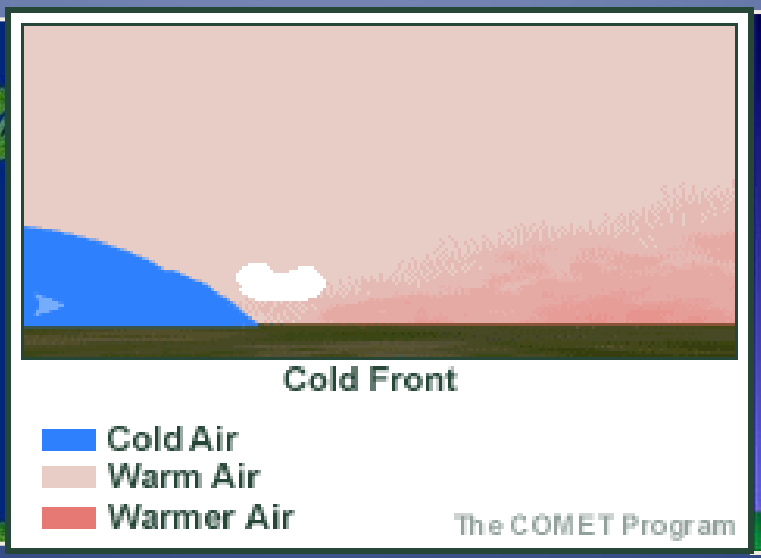
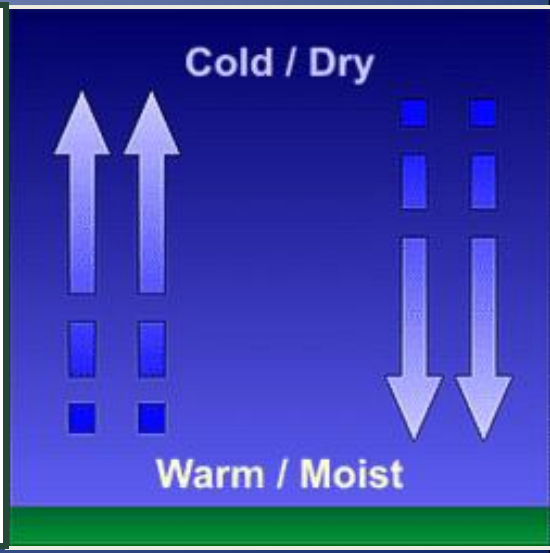
Thunderstorm Ingredients

All thunderstorms require three ingredients for their formation:

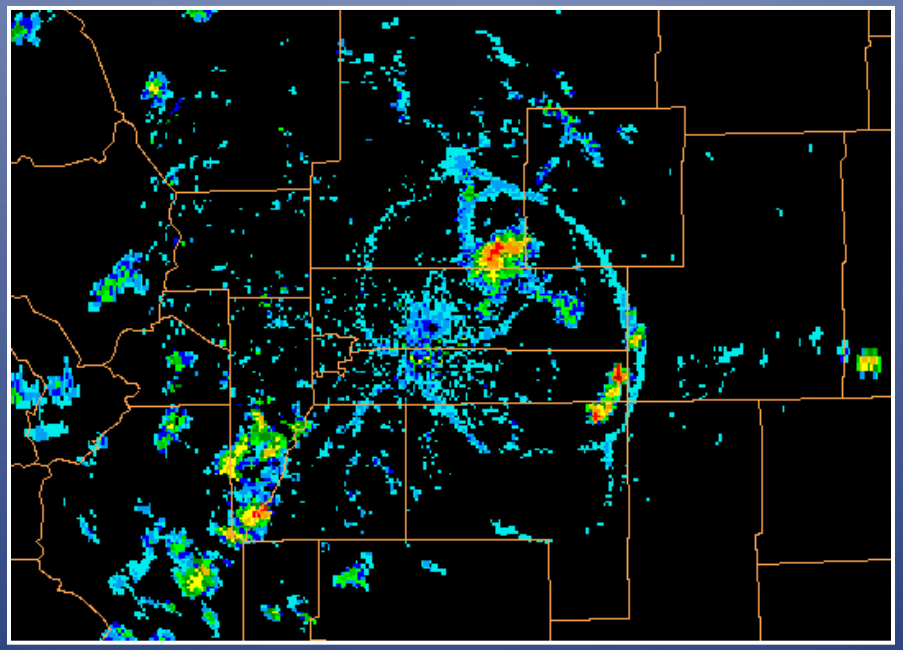
1. Moisture
2. Lifting mechanism
3. Instability





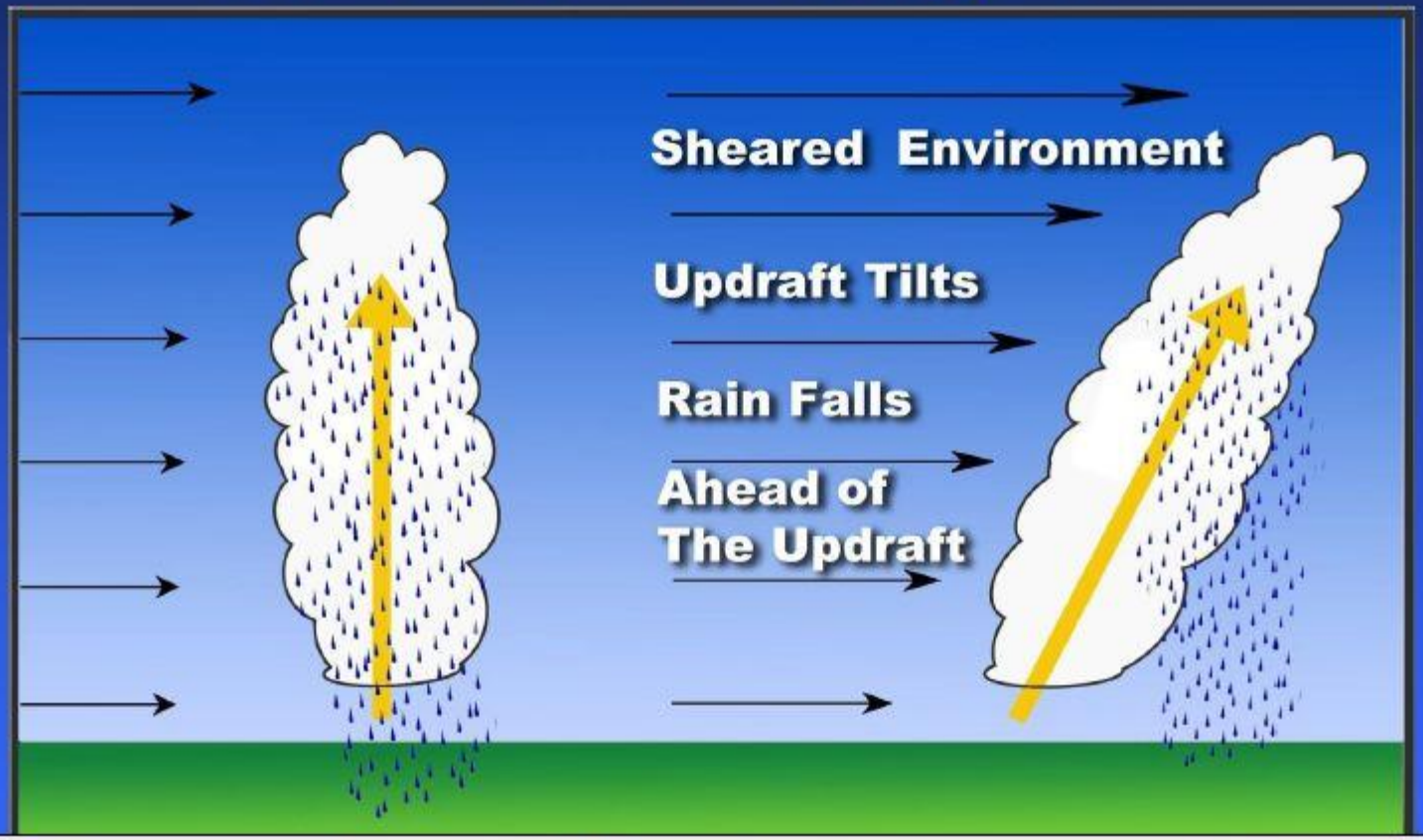
Outflow Boundaries

- “Mini cold front” caused by rain cooled air rushing out of storm
- Boundary lifts warm, moist air
- Can cause new thunderstorms to form



A 4th Ingredient for strong to severe storms: Wind Shear

Weak shear vs. Strong shear



The longer the updraft lives, the stronger the storm can become, and the better the chance for severe t-storm impacts.

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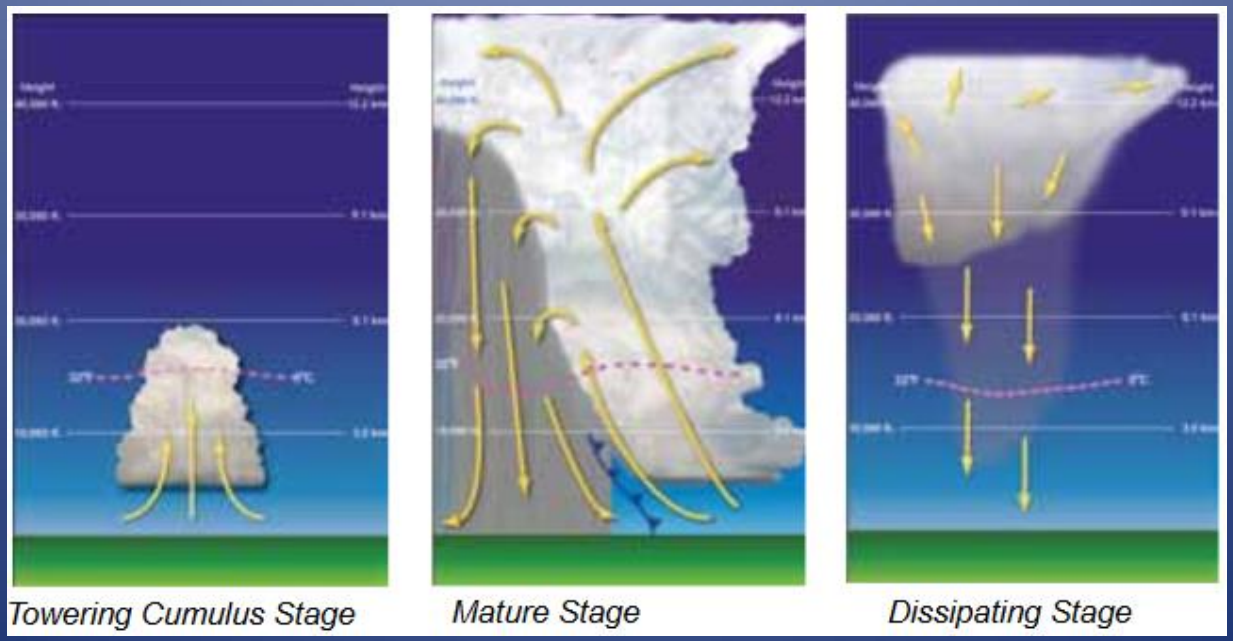
Life Cycle of a Thunderstorm

Generally lasts 30-60 minutes



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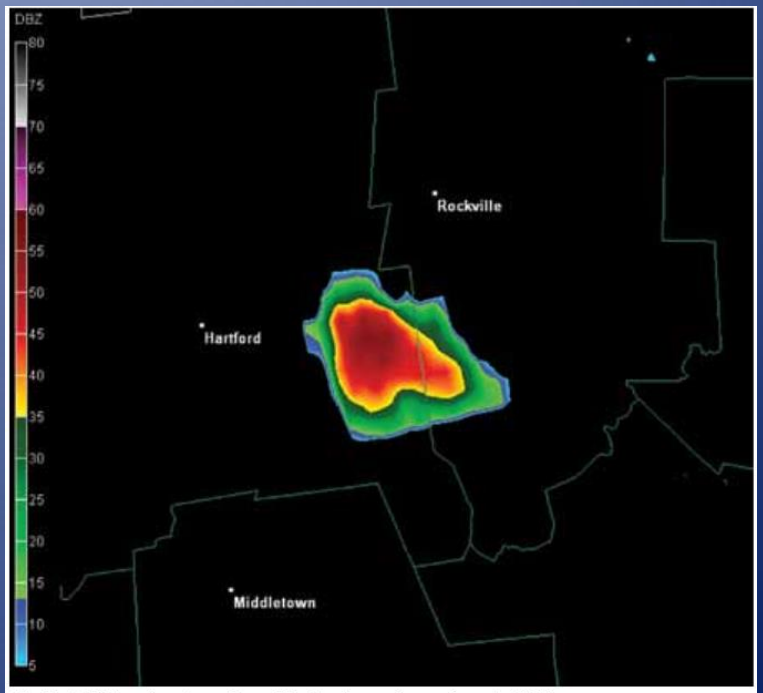
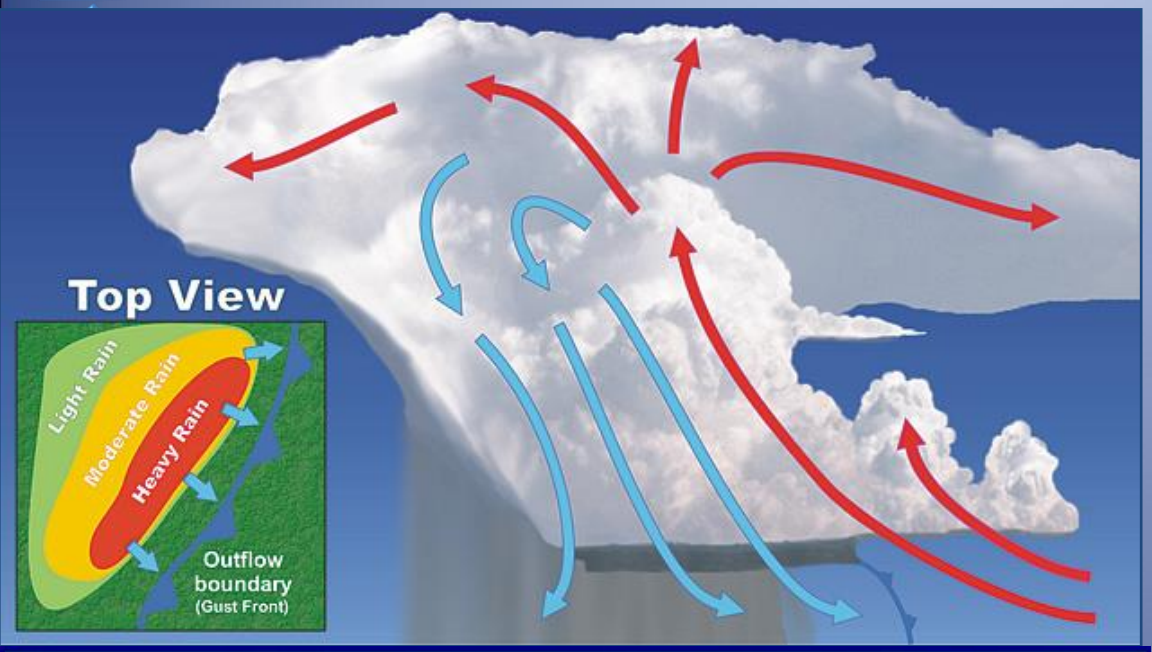
3 Types of Thunderstorms
First, the Single Cell

Short-lived; usually not severe; may produce gusty winds and small hail.



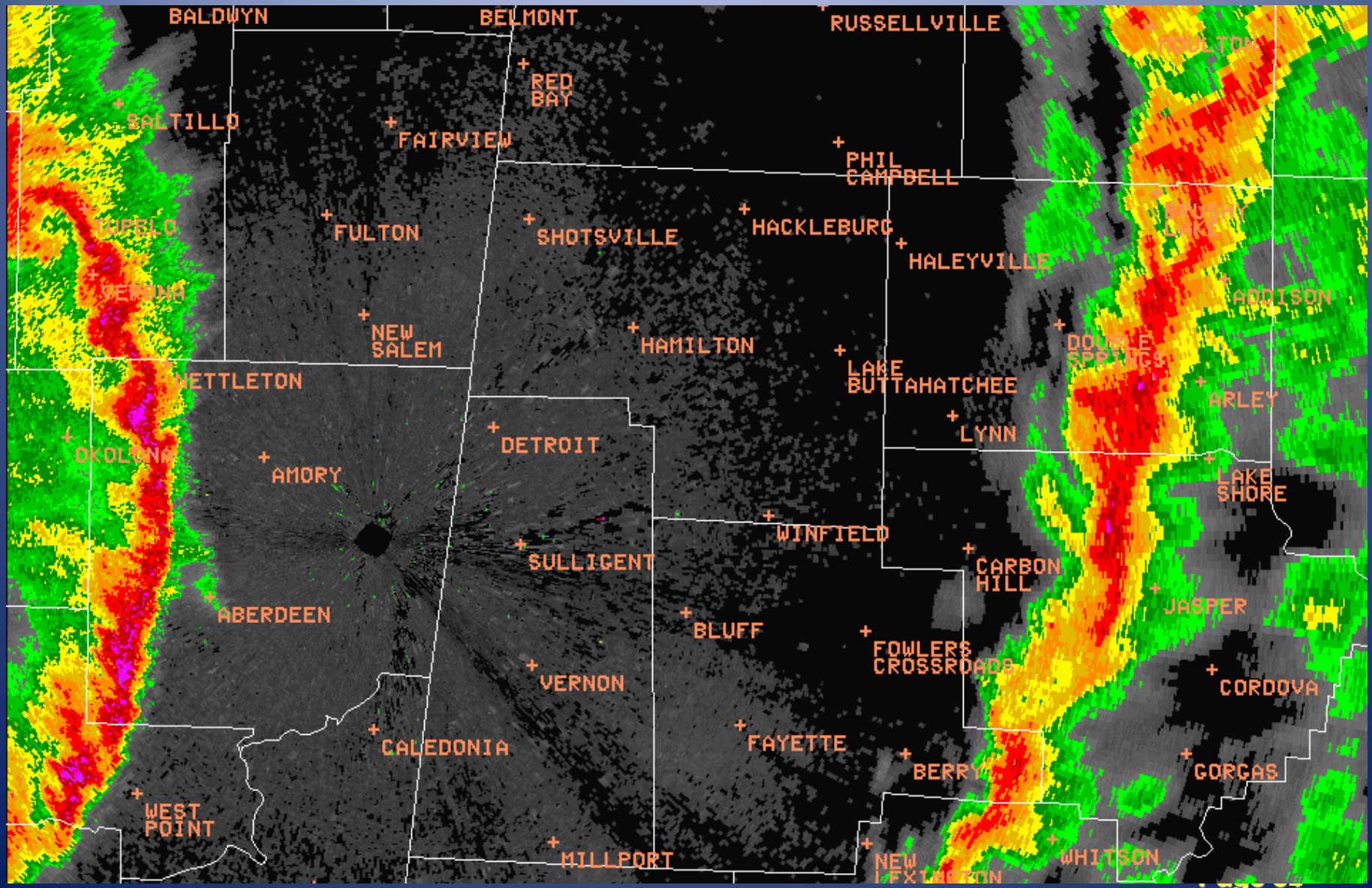
Single Cell Thunderstorm viewed by Boston radar on June 9, 2008.



Multicell Thunderstorm

Occasionally Produces Severe Weather (Damaging Wind Gusts & Hail)

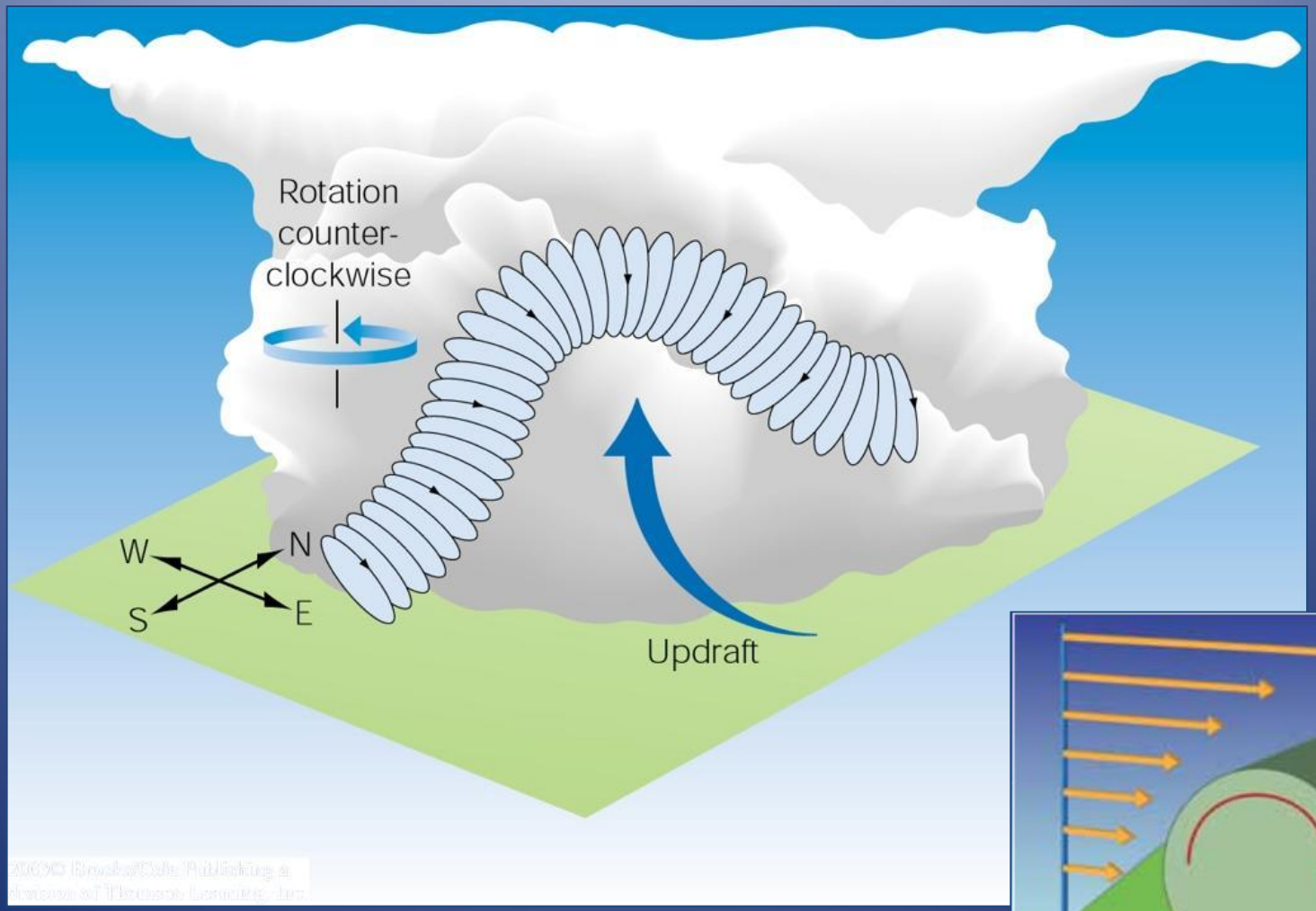
Multicell Line or Squall line



Supercell Thunderstorm

- Less than 5% of all thunderstorms
- Lasts longer than 3 hours
- Always has severe weather
- Can produce large, violent tornadoes

Tilted Shear – Rotating T-Storm



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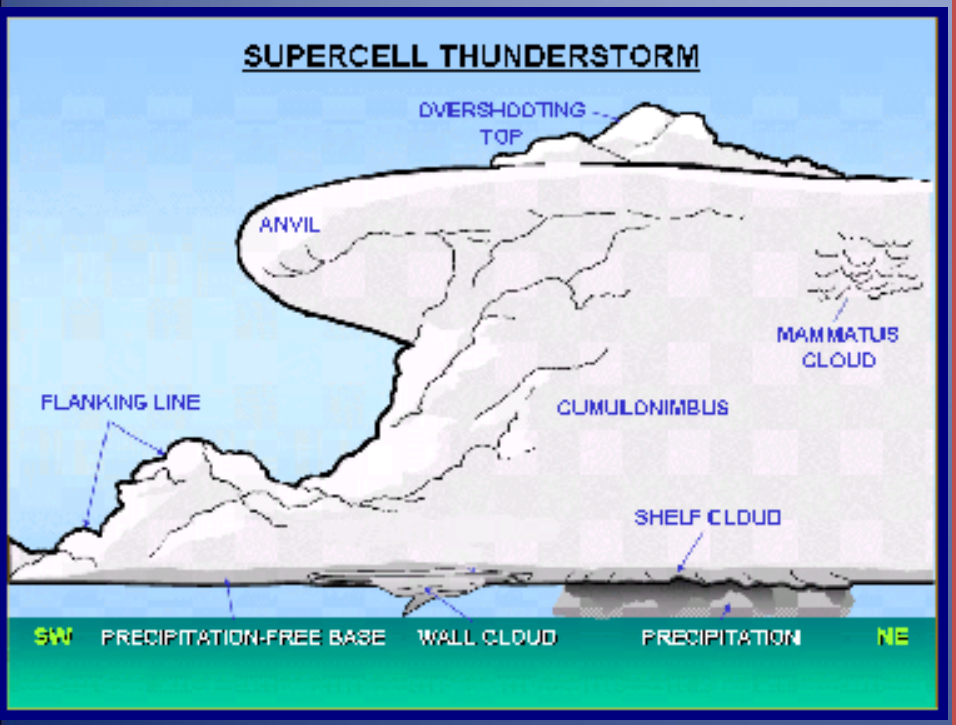
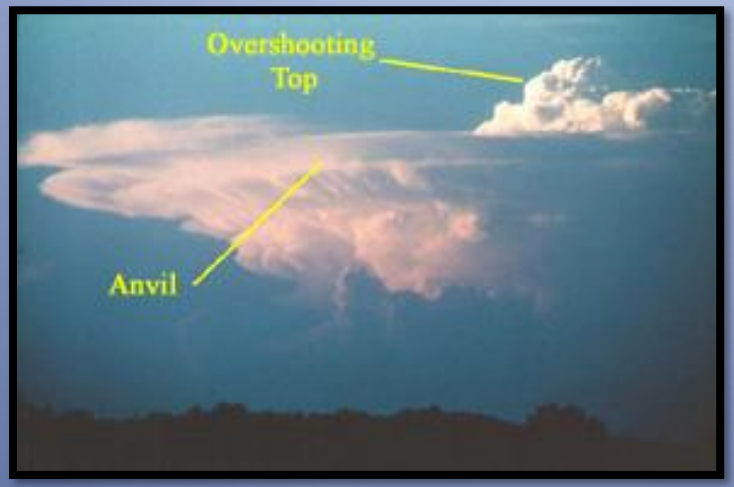
A Classic Supercell

Hebron, ND Hail Storm on July 17, 2001



Visual Clues of a Strong Storm



An overshooting top suggests a powerful updraft and a stronger storm.

Look at the main storm tower…

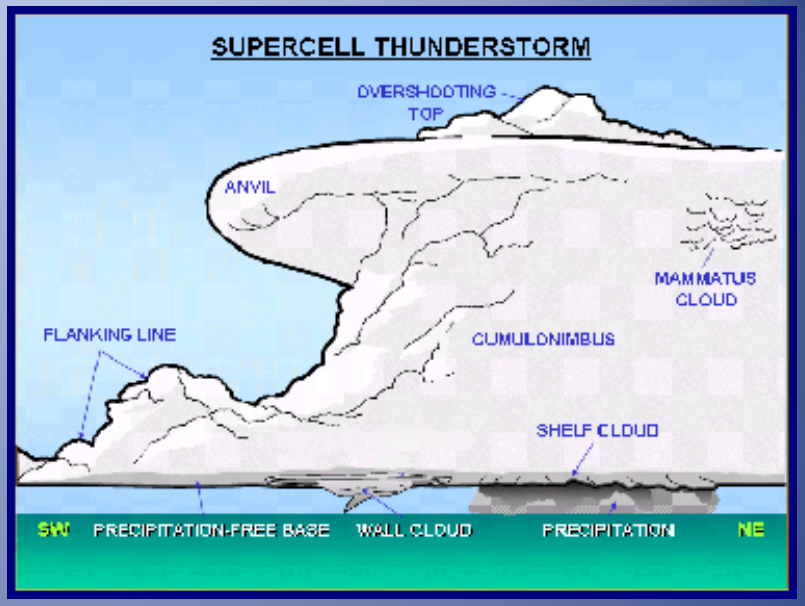
A hard and crisp-looking, cauliflower appearance suggests a stronger updraft and stronger storm.

A soft and mushy-looking storm suggests a weaker updraft and weaker storm.

The Shelf Cloud

A sign winds will pickup &

change directions



What a person sees

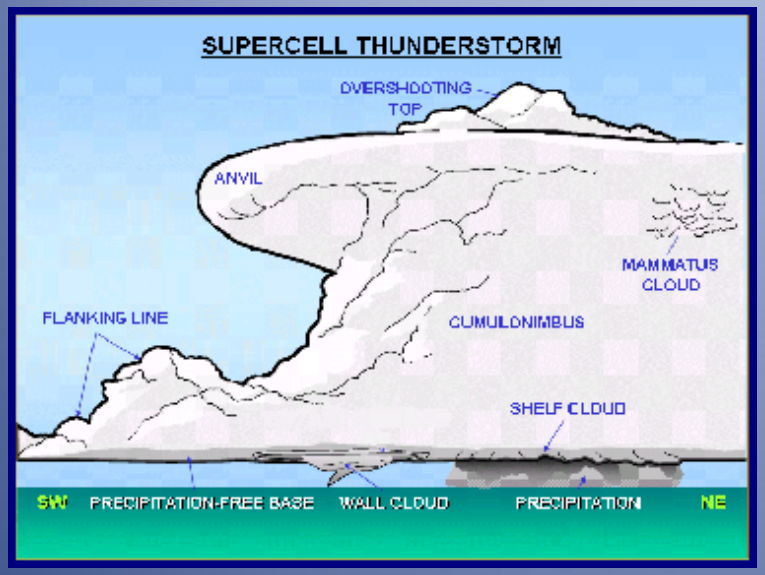
What the radar looks like

More Shelf Clouds

Shelf Cloud

- -Marks the leading edge of the gust front
- -Usually produced by rain cooled air
- -Can be found on the FFD or RFD
- -Usually in area of low level shear
- -Slope down away from precipitation area
- -Often associated with a squall line- can be associated with gustnadoes or damaging straight-line wind

Wall Clouds



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Tornadic Wall Clouds

Will my wall cloud produce a tornado?

Look for these 4 things:

1. Rotation
2. Rapid vertical motion
3. Strong winds blowing into the storm
4. Persistence

Wall Cloud-Developing Funnel Cloud

Mature Tornado

Dissipating Rope Stage

Straight Line Winds (non-tornadic winds)

Debris is the #1 killer in high wind

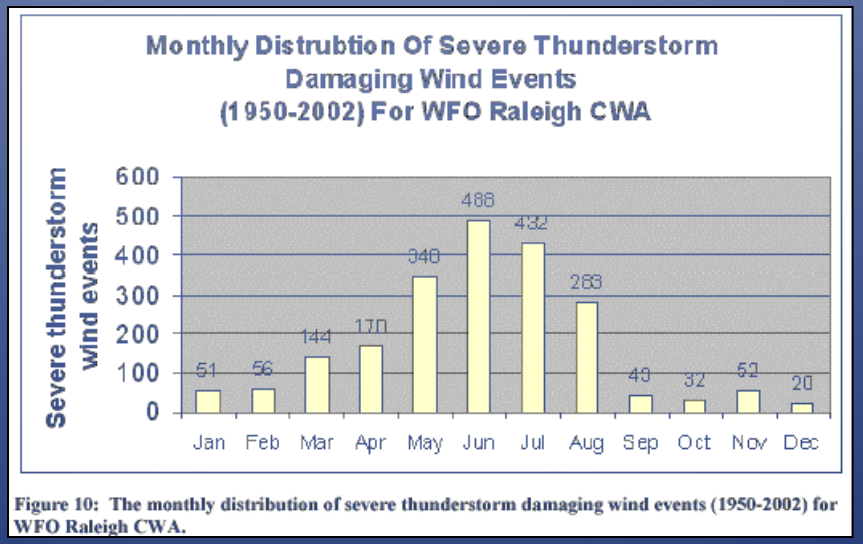

Figure 10: The monthly distribution of severe thunderstorm damaging wind events (1950-2002) for WFO Raleigh CWA.

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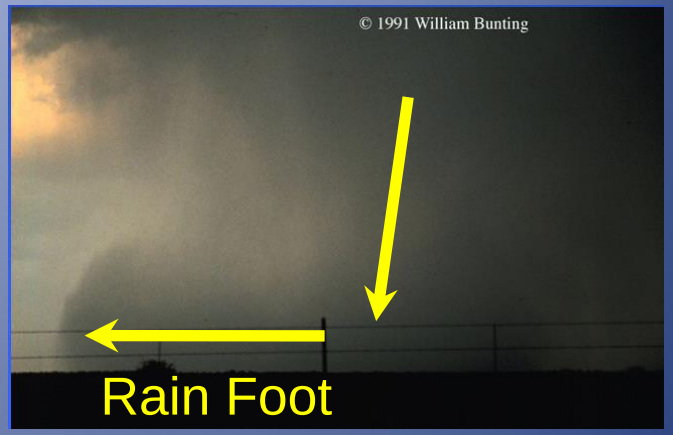
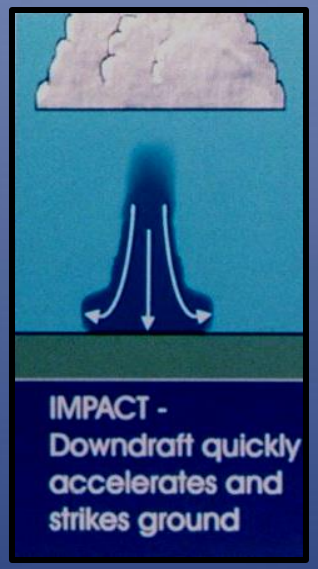
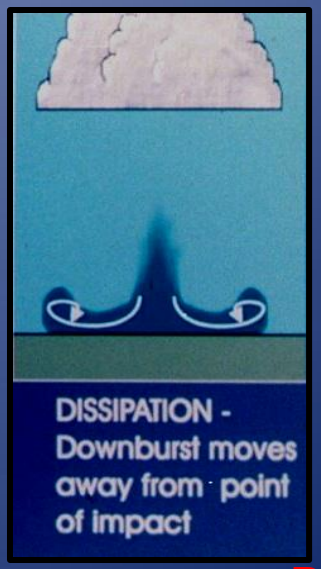
Damaging Thunderstorm Downburst







Hail Safety



Hail Safety

- Use common sense!!
- Get inside!
- Don’t try to run through it!
- Seek shelter for your vehicle if available and if you have the time to do so.

Flash Flooding is the #1 Thunderstorm-Related Killer

3 SIMPLE STEPS FOR
FLASH FLOOD SAFETY

During a flood, water levels and the rate at which the water is flowing can quickly change. Remain aware and monitor local radio and television.

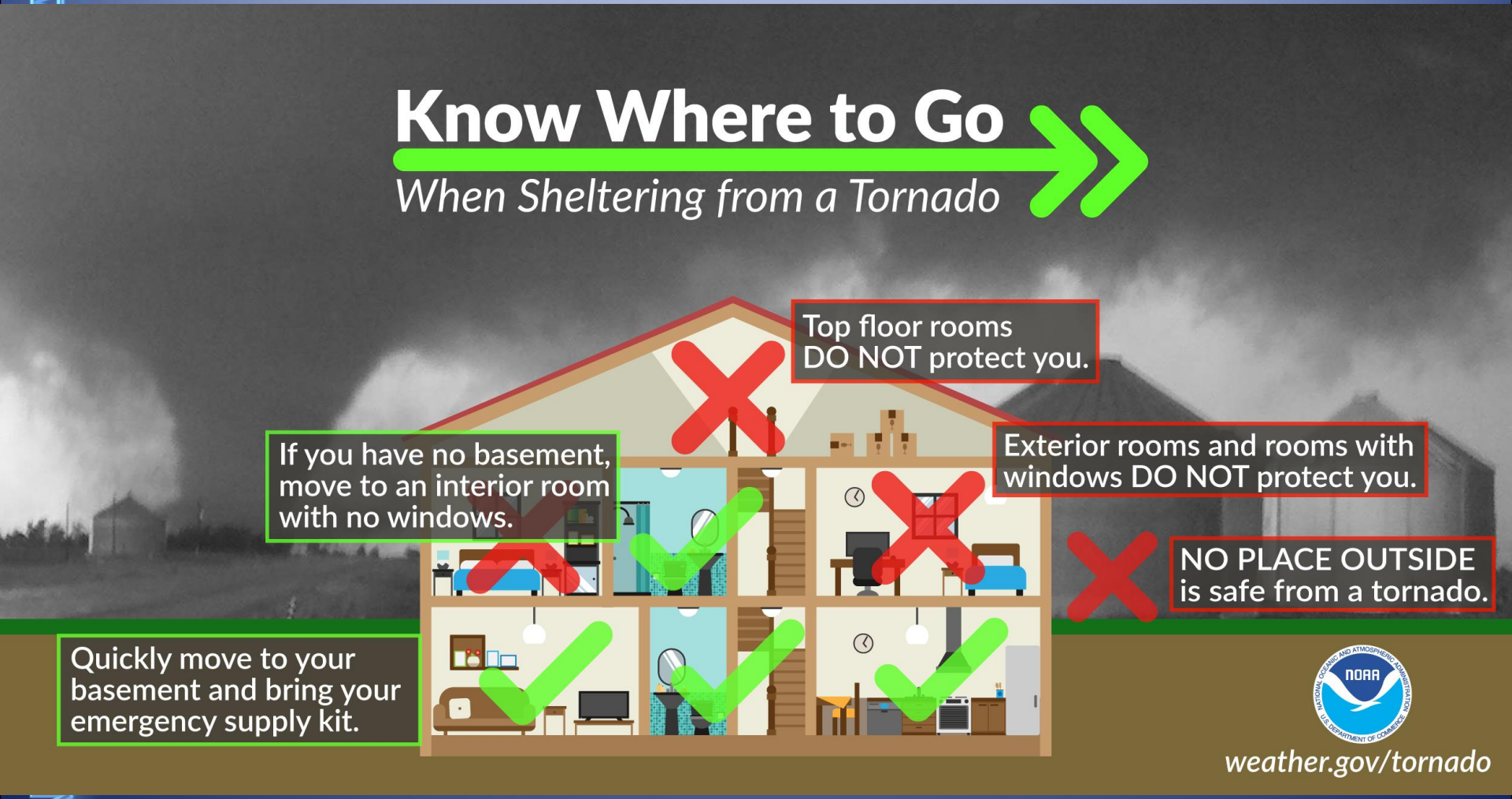
weather.gov/flood

1 GET TO HIGHER GROUND
Get out of the areas subject to Flooding

2 DO NOT DRIVE INTO WATER
Do NOT drive or walk into flooded areas. It only takes 6" of water to knock you off your feet.

3 STAY INFORMED
Monitor local radar, television, weather radio, internet or social media for updates.

Tornadoes – Safety Rules



Mobile homes are not safe; find an alternate shelter.

Damaging Non-Tornadic Winds

Strong or severe straight-Line thunderstorms winds:

- ✓ Can be as powerful as a tornado's winds
- ✓ For severe thunderstorms, the same safety rules apply as if it was a tornado.

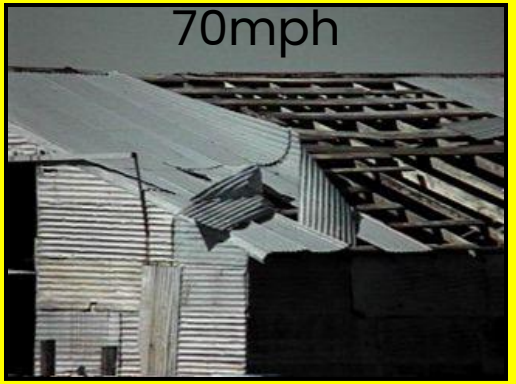
40-50mph

Small branches and debris

50-60mph

Large branches

60-70mph



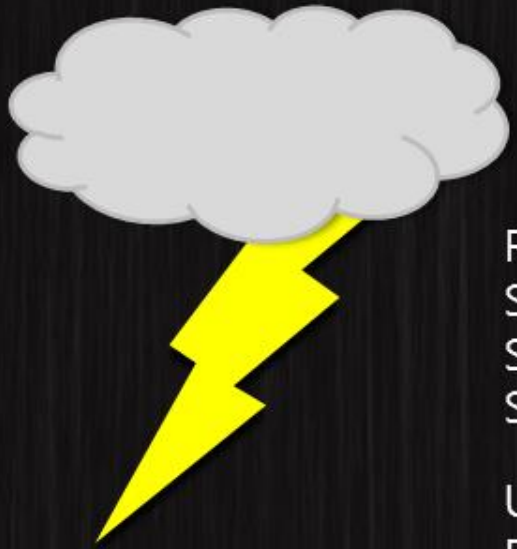
Small structural damage, small trees

>70mph

Significant Property damage

Lightning

Do's and Don'ts



Do

Go Inside When You Hear Thunder or See Lightning!

Find a Sturdy House, Building, Car With A Roof

Stay Indoors For at Least 30 Minutes After You Last Hear Thunder

Don't

Retreat to Dugouts, Sheds, Pavilions, Picnic Shelters or Other Small Structures

Use or Touch Electronics, Outlets, Corded Phones or Windows

Go Under or Near Tall Trees, Swim or Be Near Water, Stand Near Metal Objects

weather.gov/lightning

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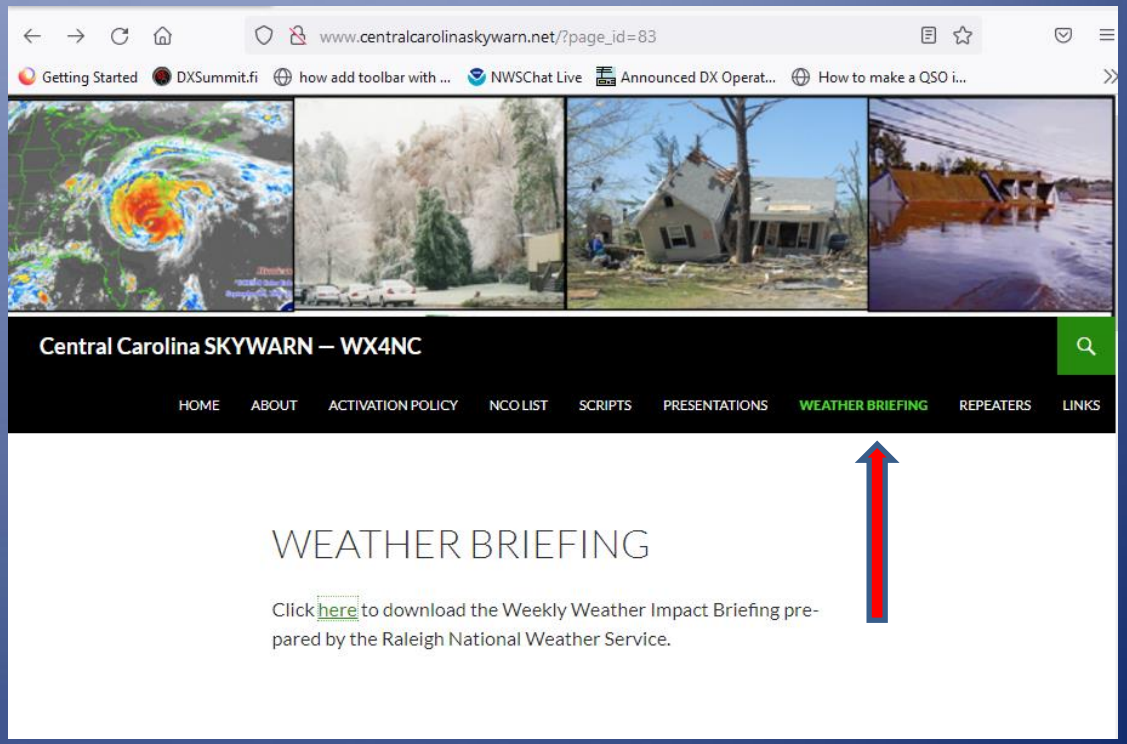
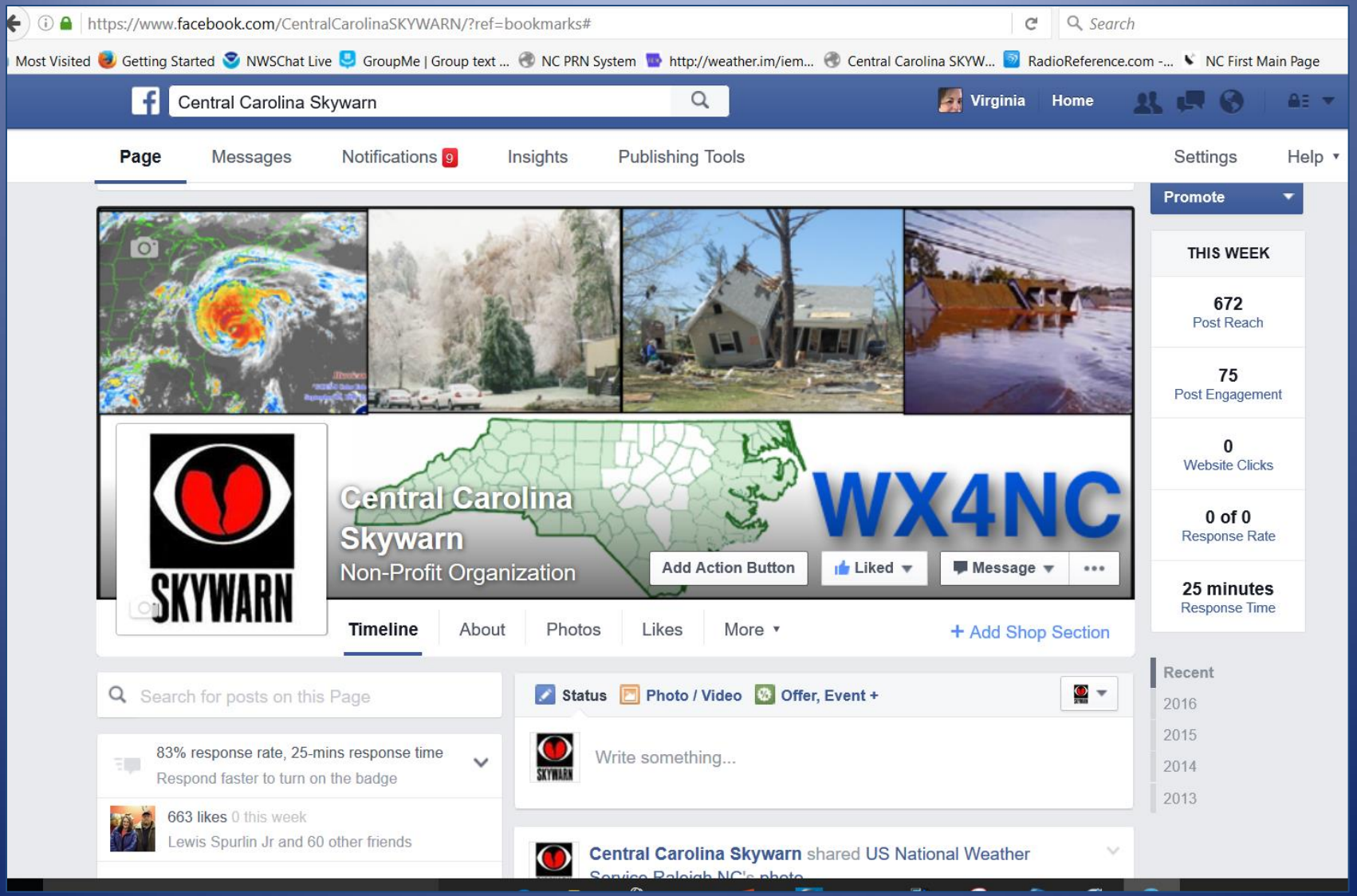
SKYWARN Information Net

- Every Tuesday 9:15pm, 145.210 repeater
- Weekly Weather Impact Briefing; download from www.centralcarolinaskywarn.net

Nick Petro
Warning Coordination
Meteorologist
WX3H



Please “Like” us on Facebook



Wrap-Up Instructions

Laurie Meier will send me a list of check-ins with email addresses.

I will send each person a SKYWARN Spotter Handout.
-list of reporting criteria
-confidential telephone number which you may call to make reports.
-a link to register online to be included in the NWS database..
-a link for you to print a SKYWARN certificate with your name and date.

Listen to live stream audio of SKYWARN activations at www.broadcastify.com

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