



NOAA / National Weather Service

Weather Spotter Training

NATIONAL WEATHER SERVICE
Columbia, SC

Please MUTE your computer
microphone or phone microphone until
you're ready to speak. Thank you!





NOAA / National Weather Service

Weather Spotter Training

Doug Anderson

W4NWS

Observing Programs Lead

NWS Columbia, SC

douglas.anderson@noaa.gov





Outline

- **National Weather Service Overview**
- **Why are Storm Spotters Important?**
- **Weather Hazards and Safety**
- **Severe Weather Reporting Procedure**
- **Outlooks/Watches/Warnings**
- **Monitoring Severe Weather**



Outline

- **National Weather Service Overview**
- **Why are Storm Spotters Important?**
- **Weather Hazards and Safety**
- **Severe Weather Reporting Procedure**
- **Outlooks/Watches/Warnings**
- **Monitoring Severe Weather**



National Weather Service Overview

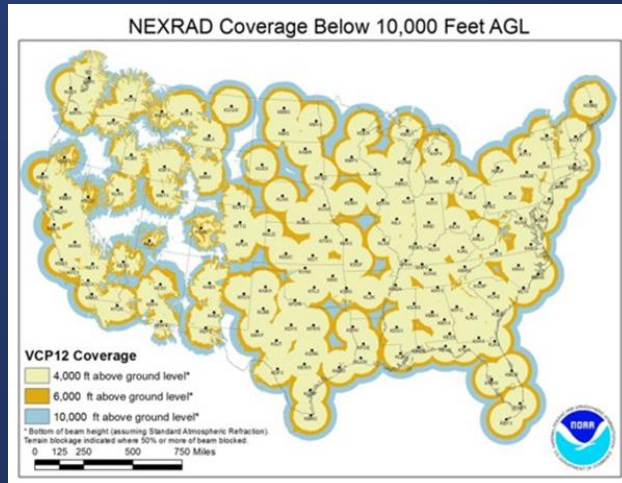


- **NWS Mission: Protection of Life and Property** and enhancement of the national economy.
- **Service: We are always here!**
 - Staffed 24 hours/day, 365 days/year
 - Forecasters work rotating shifts



National Weather Service Overview

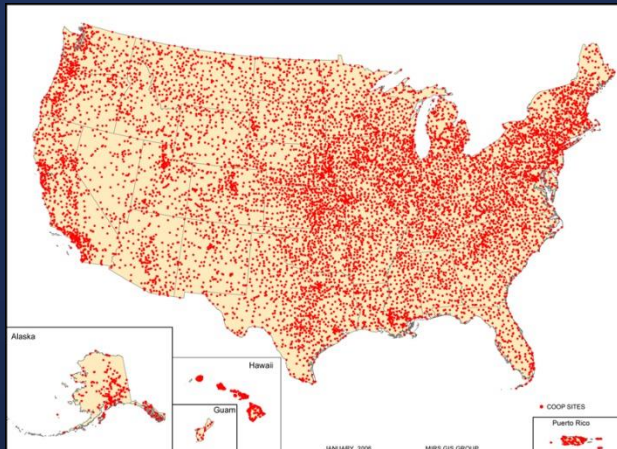
Doppler Radars



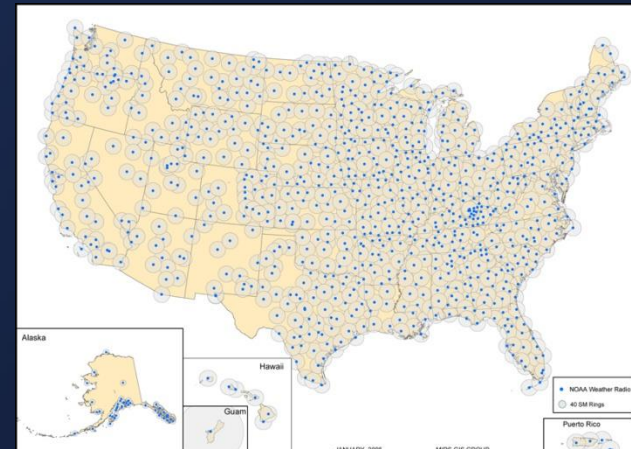
Automated Surface Observing Sites



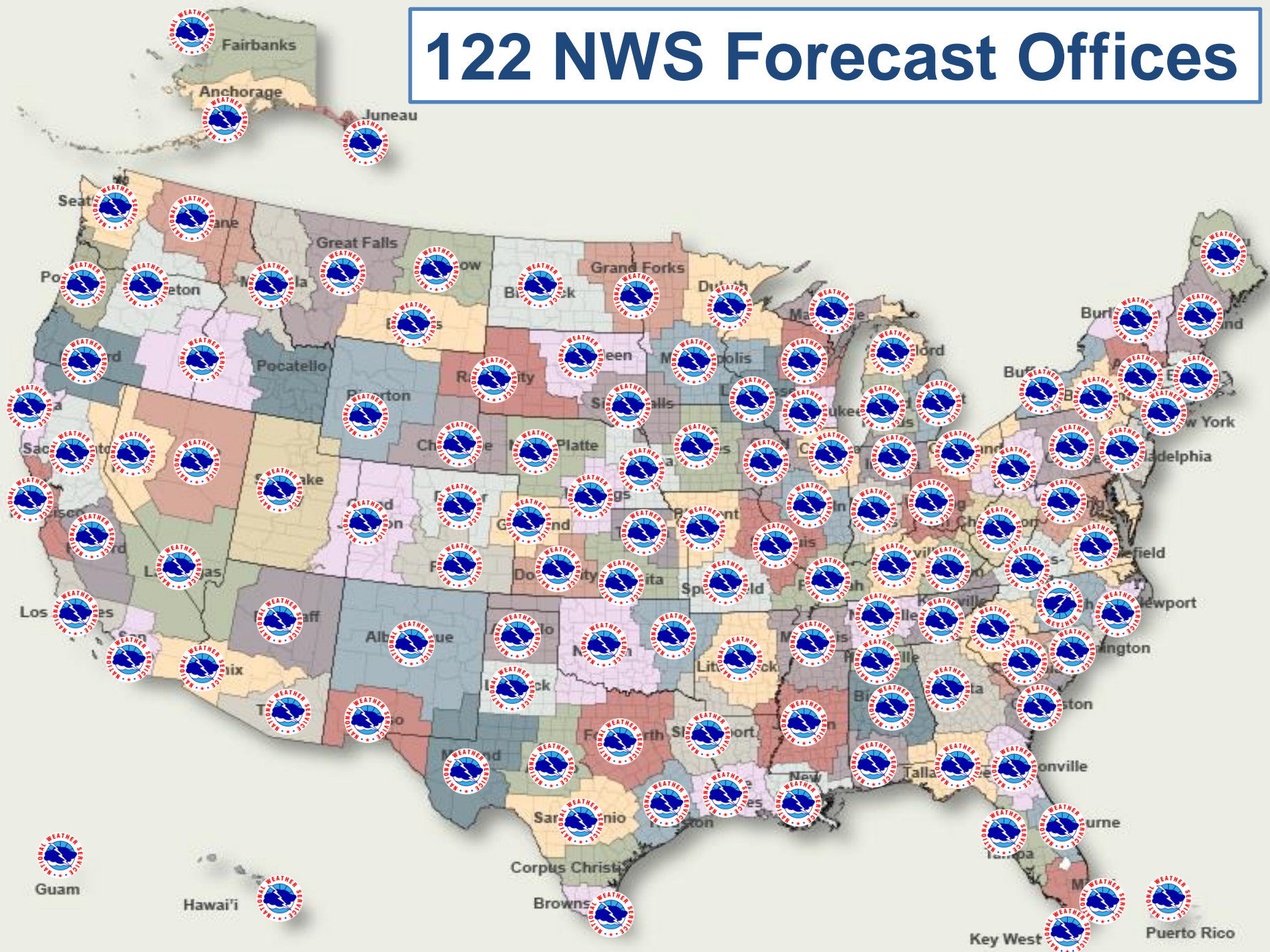
Cooperative Observer Sites



NOAA Weather Radio Transmitters



122 NWS Forecast Offices





NWS Columbia Area of Responsibility

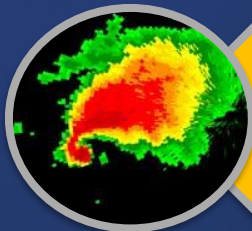


Population (2018 est.):
1,873,103

23 Counties
(18 in SC, 5 in GA)



NWS Columbia Responsibilities



Highest Priority:
Severe Weather
Watches, Warnings,
& Advisories



7 Day Public Forecasts



Aviation Forecasts



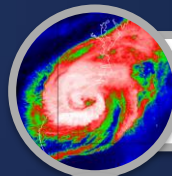
Fire Weather Forecasts



River Flood Warnings



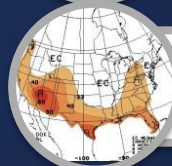
Lake Forecasts



Tropical Support



Collect Weather Data



Climate Reports



Decision Support Services



Education/Outreach &
Preparedness



Collaboration w/ Federal,
State, Media, etc.



Local Research, Attend
Scientific Conferences



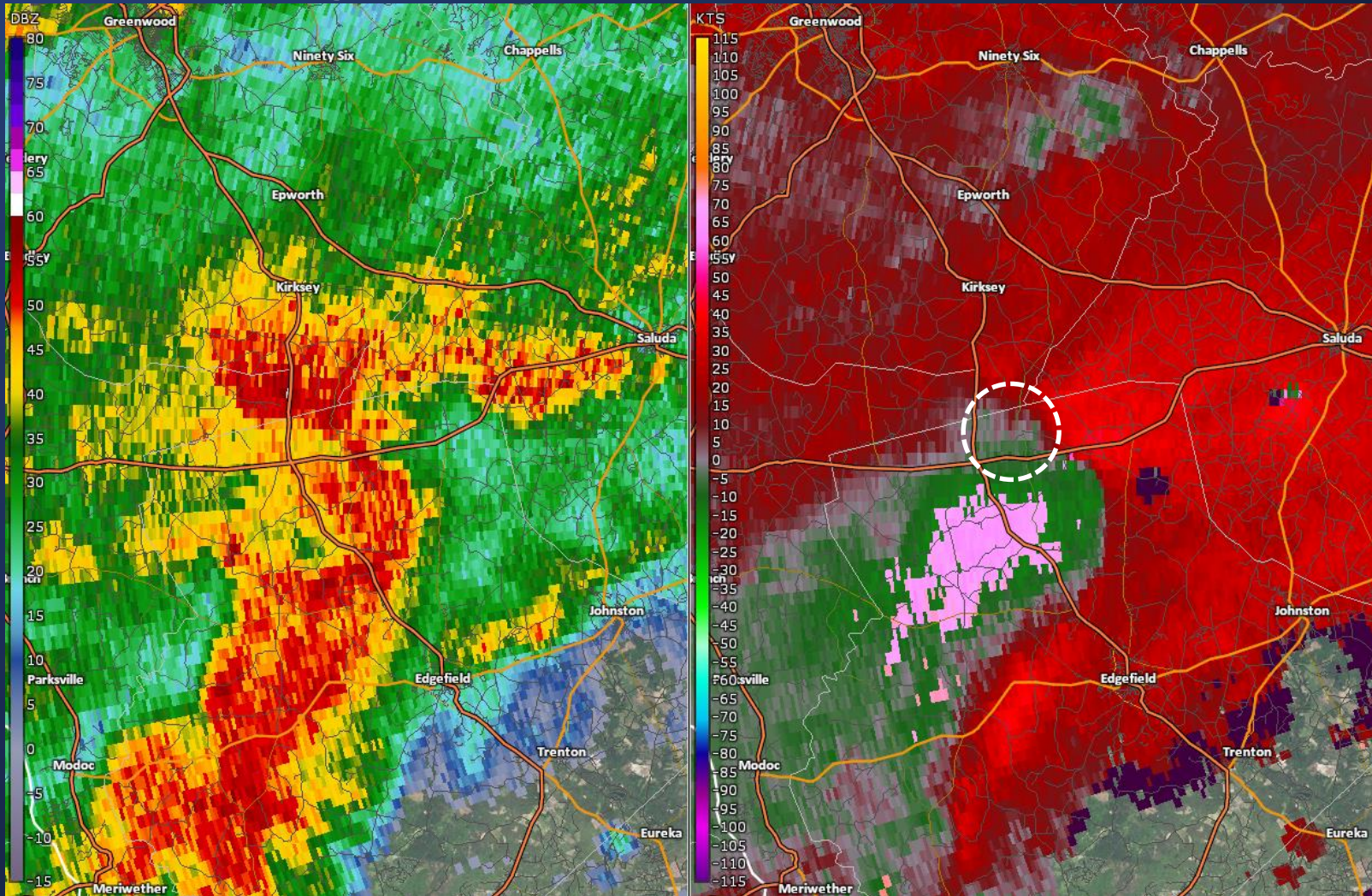
Outline

- National Weather Service Overview
- **Why Storm Spotters are Important!**
- Weather Hazards and Safety
- Severe Weather Reporting Procedure
- Outlooks/Watches/Warnings
- Monitoring Severe Weather



The Importance of Spotter Reports

Is this storm Severe or Tornadic?



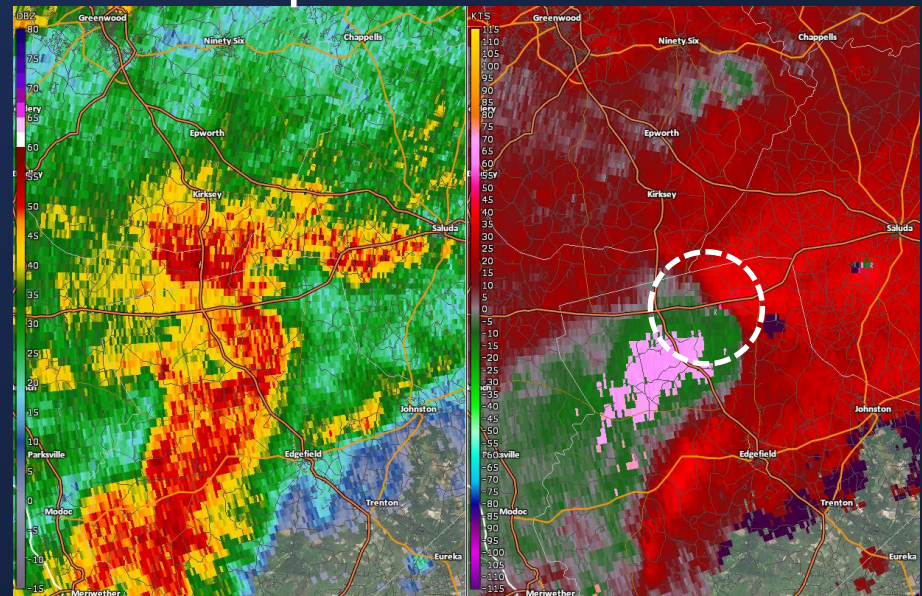


The Importance of Spotter Reports

Should a Warning be issued?



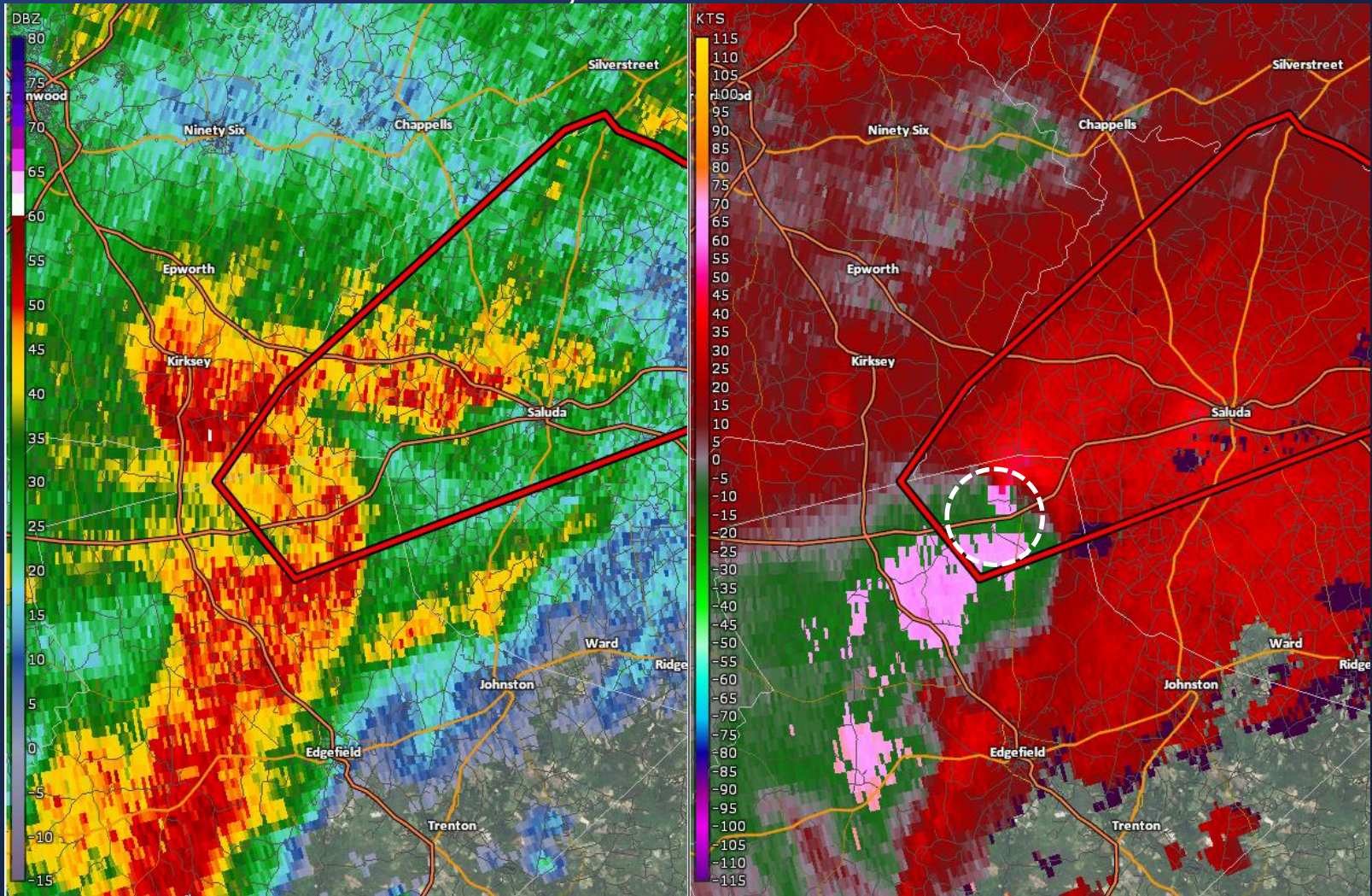
Storm has good rotation,
but NO reports!





The Importance of Spotter Reports

Based on radar indication, a TORNADO WARNING is issued!

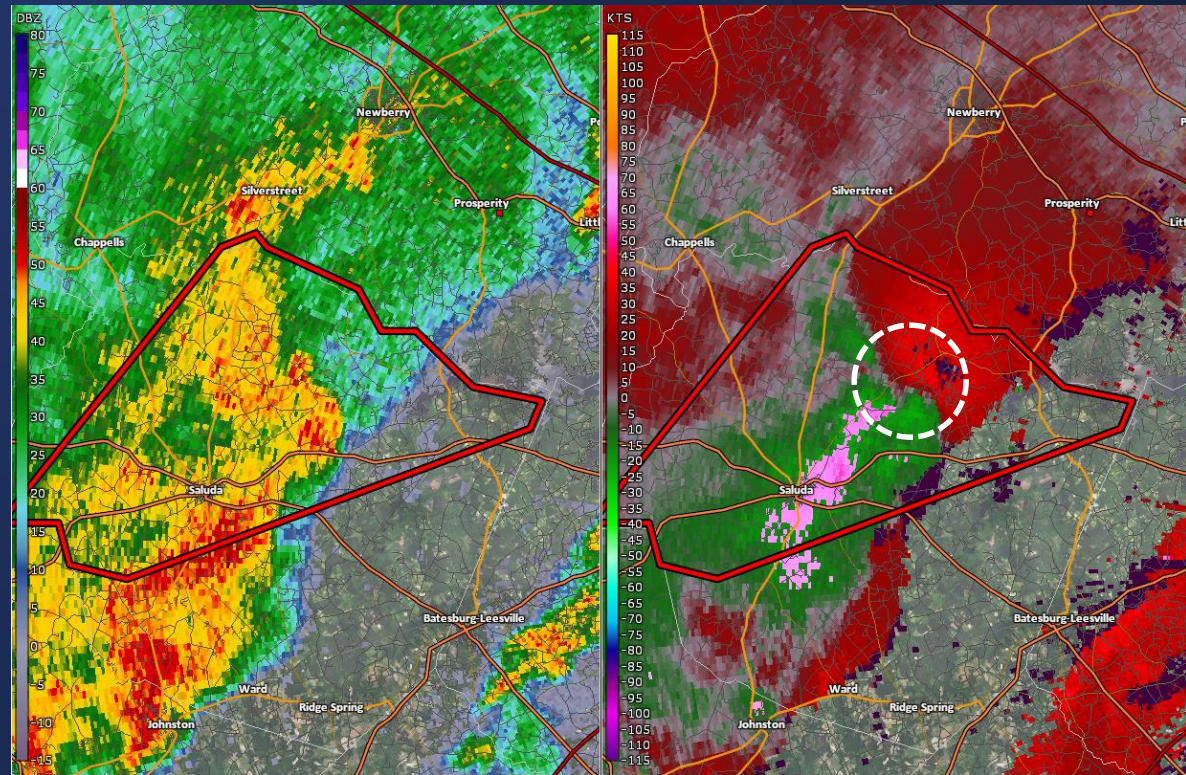




The Importance of Spotter Reports

It's 20 minutes later...

- The storm is about to move out of the warned area.
- The storm has weakened, but still has strong rotation
- Still NO reports!!!



WHAT SHOULD I DO?



Should a new warning be issued???



The Importance of Spotter Reports

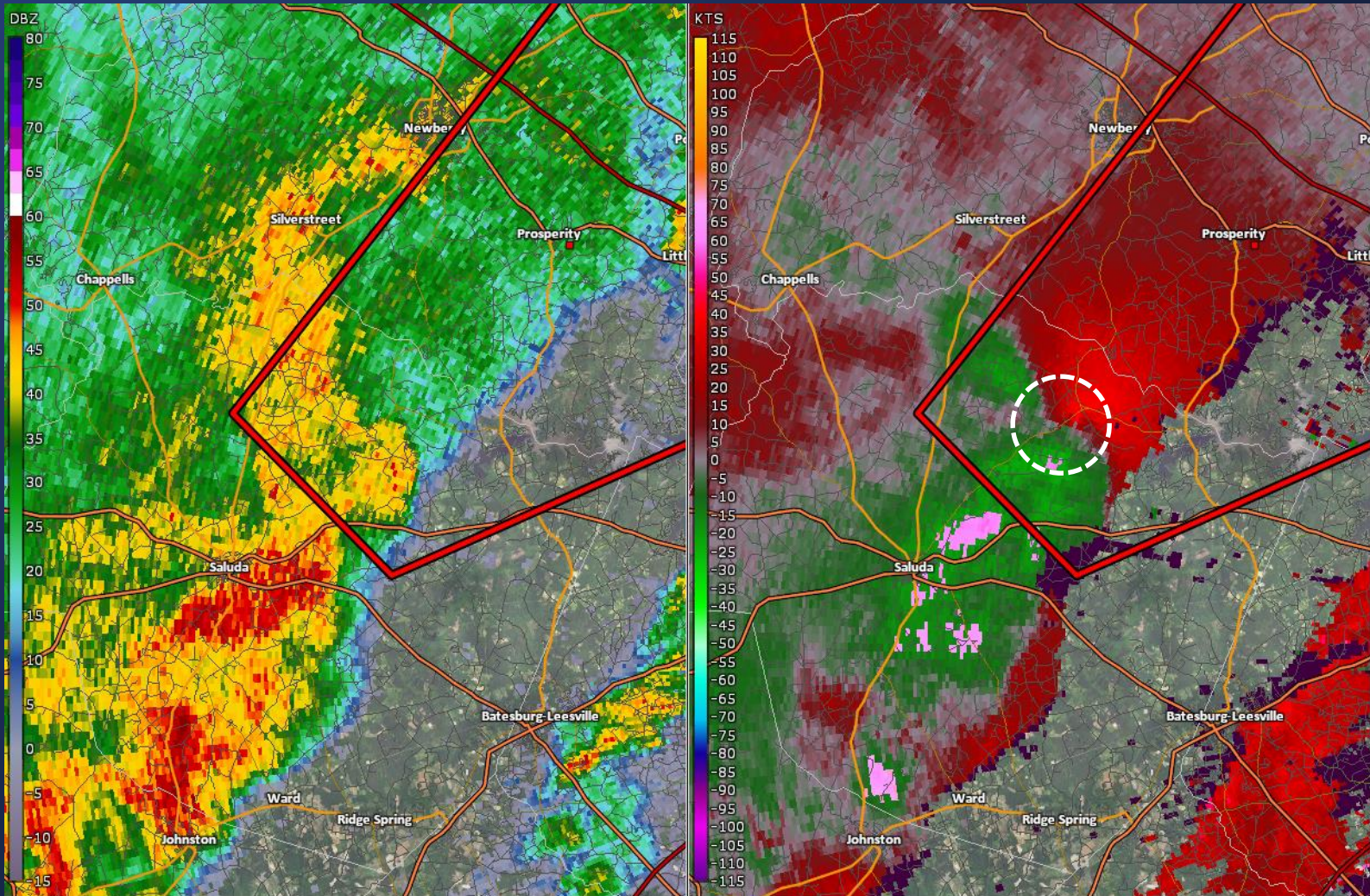
Spotter reports tornado on the ground with mobile homes damaged and numerous trees down!!!





The Importance of Spotter Reports

Based on spotter report, a new TORNADO WARNING is issued!





The Importance of Spotter Reports

Summary

Warning text without spotter report...

“National Weather Service Doppler Radar indicated a severe thunderstorm capable of producing a tornado...”

Warning text with spotter report...

*“National Weather Service trained spotter reported a tornado **ON THE GROUND** moving northeast toward Prosperity, SC...”*





The Importance of Spotter Reports

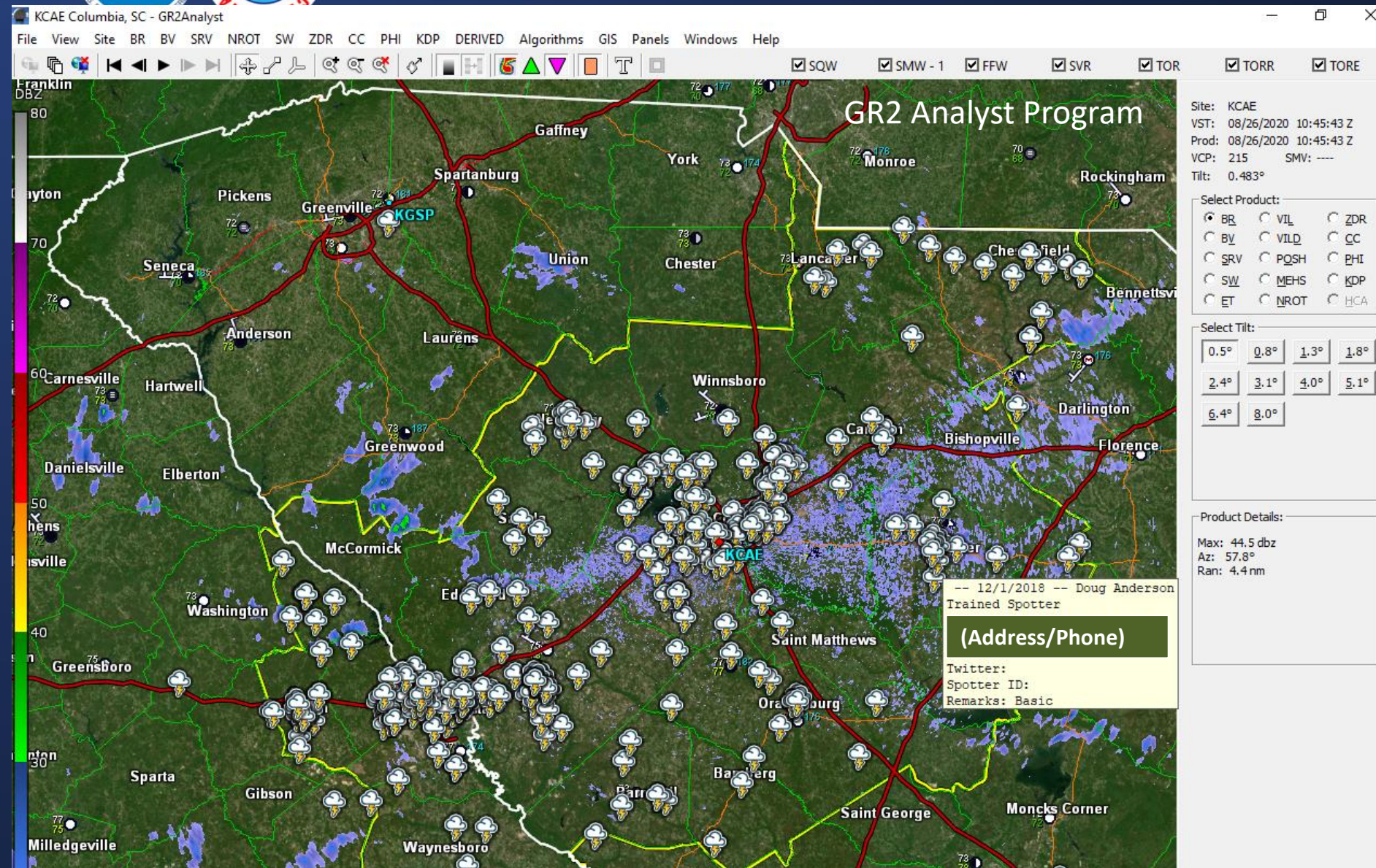
Summary

- Helps NWS fulfill mission of protecting life and property!
- Gives confidence to the warning forecaster
- Adds critical details to the warning, which heightens impacts and response
- Can provide downstream communities a more timely warning (minutes make a difference!)



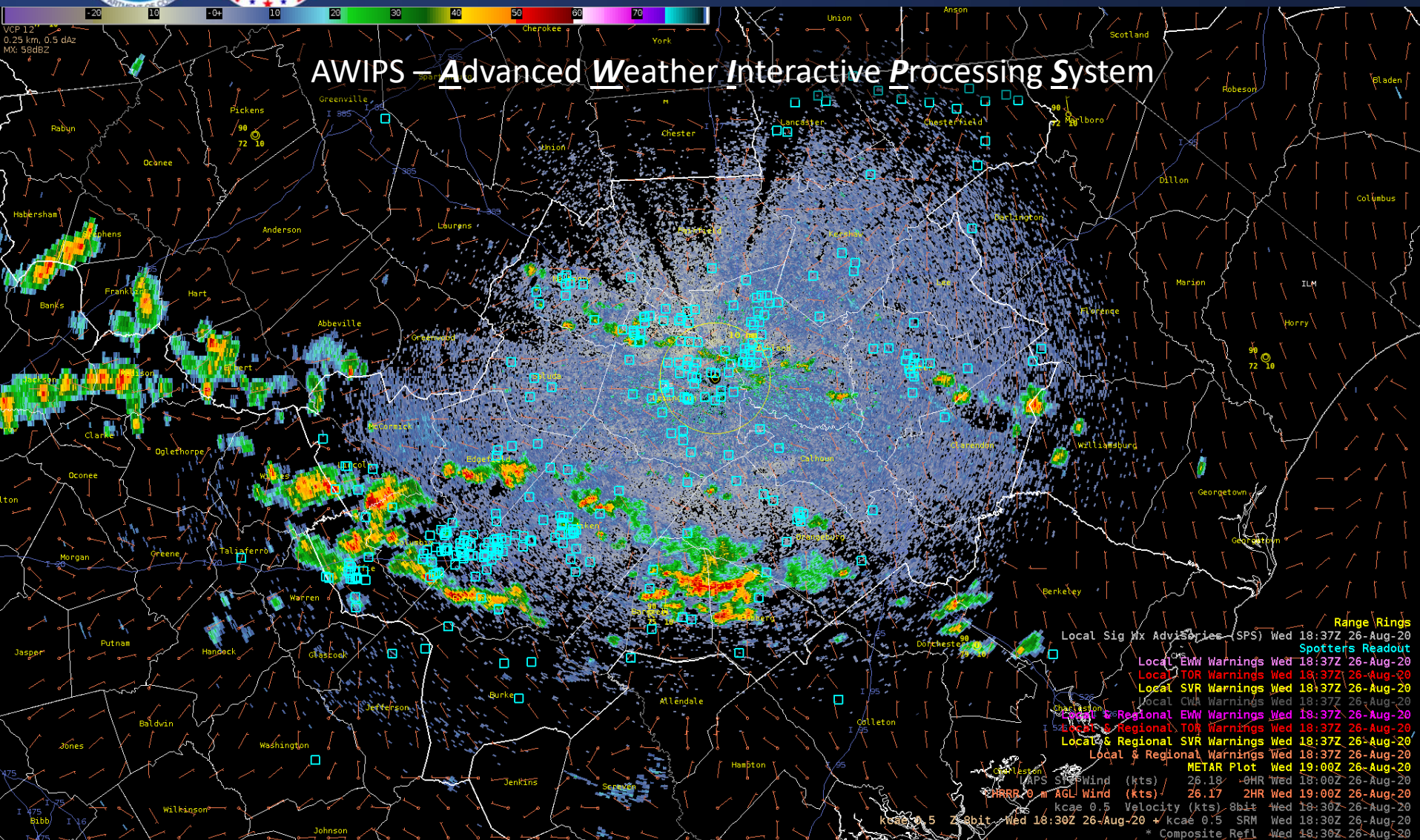


The Importance of Spotter Reports





The Importance of Spotter Reports





Outline

- National Weather Service Overview
- Why are Storm Spotters Important?
- **Weather Hazards and Safety**
- Severe Weather Reporting Procedure
- Outlooks/Watches/Warnings
- Monitoring Severe Weather



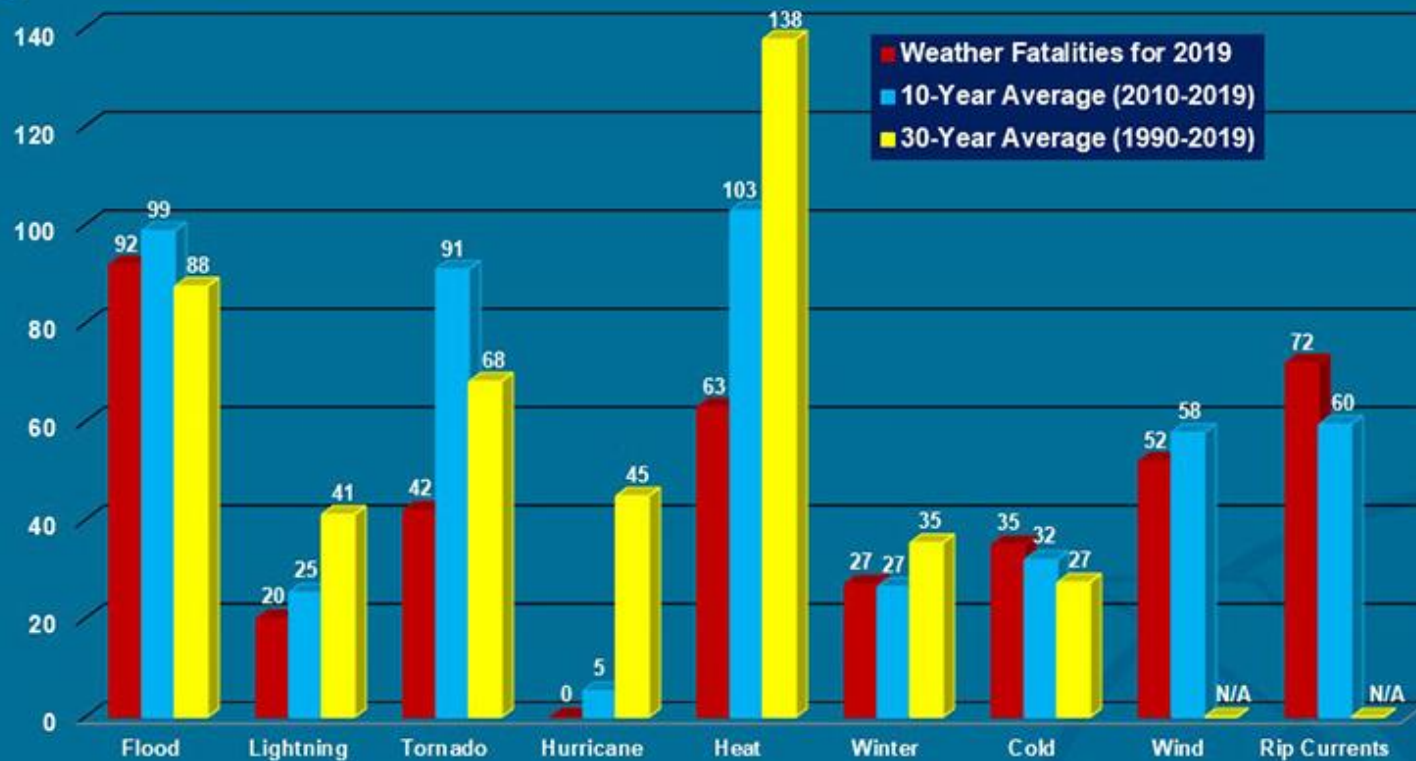
Weather Hazards and Safety





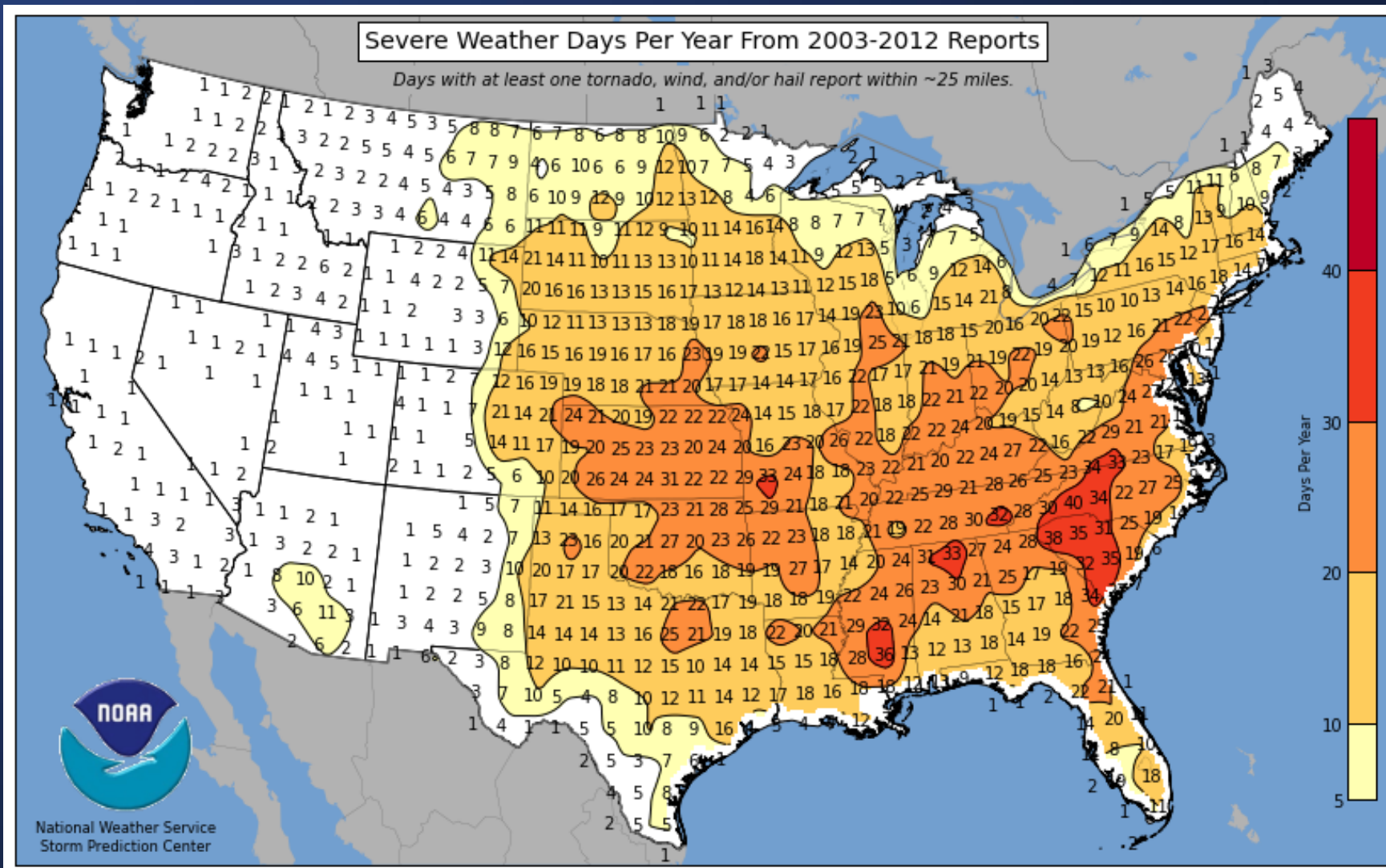
Weather Hazards and Safety

Weather Fatalities 2019





Severe Weather Days/Year





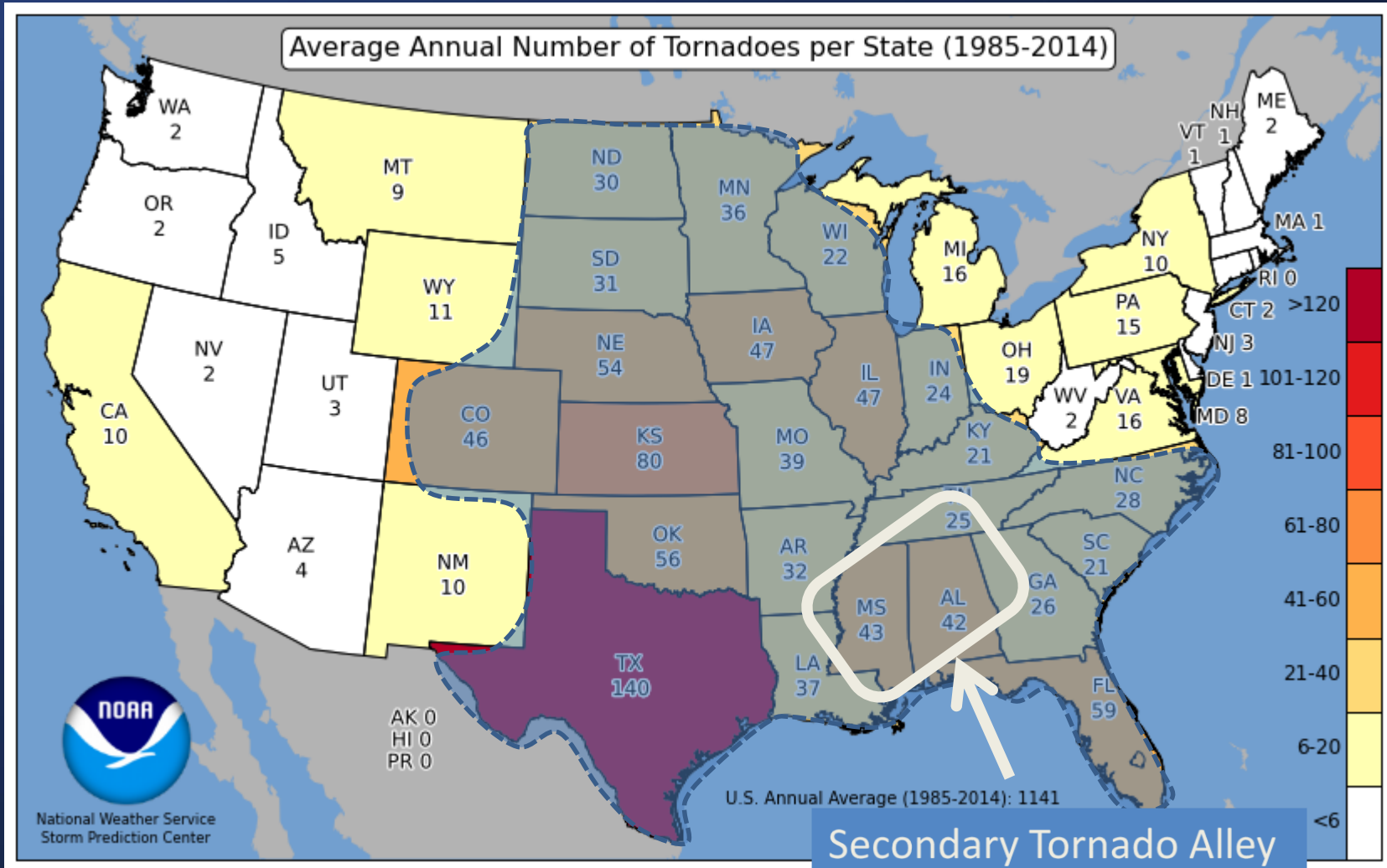
Questions

Based on the last slide, what is the leading weather-related killer?

What do you think the biggest dangers are to SKYWARN Spotters?



National Tornado Distribution



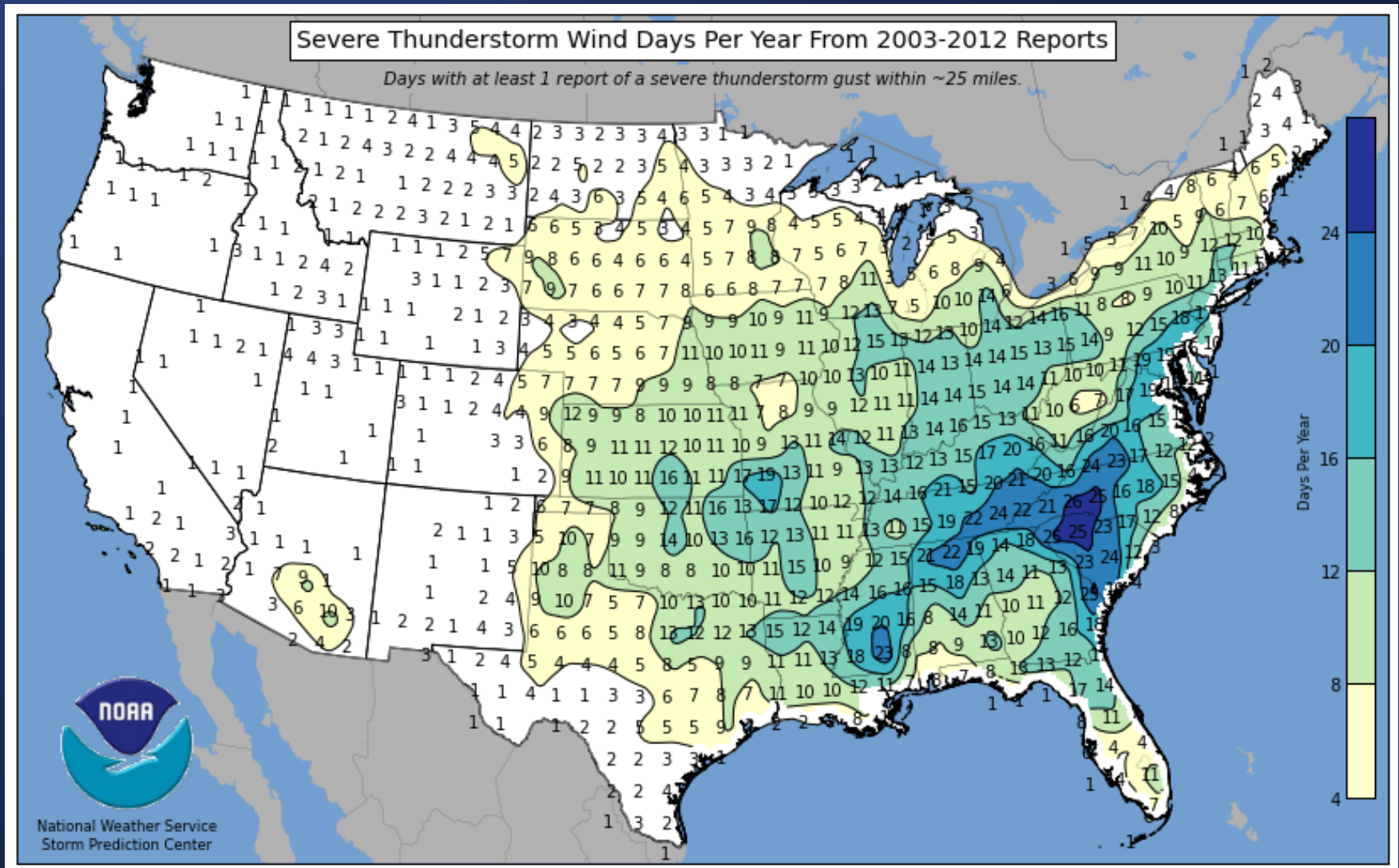


Severe Thunderstorm Winds





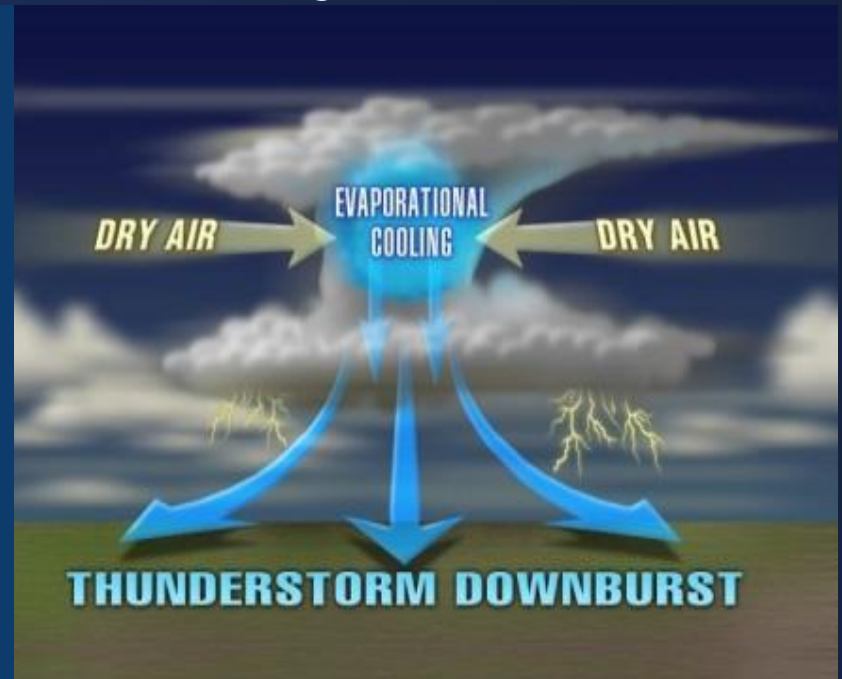
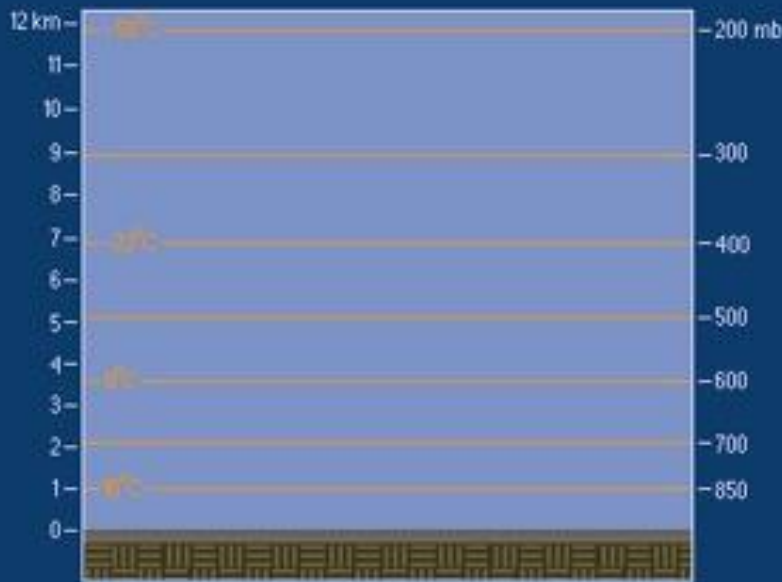
Severe Thunderstorm Wind Days/Year





Severe Thunderstorm Winds

- Clouds/Storms Form from Rising Air
- Precipitation Forms → Falls and “Drags” Air Back Down to Ground
- **Drier Air Helps to Create Stronger Downward Motion, Sometimes Strong (i.e., Downburst)**
- Wind Speeds of 60+ mph Start to Cause Damage





Severe Thunderstorm Winds

Microburst Example



Tucson Wet Microburst | August 8th, 2015

from **Bryan Snider Photography**  2 days ago  [ALL ACCESS](#)

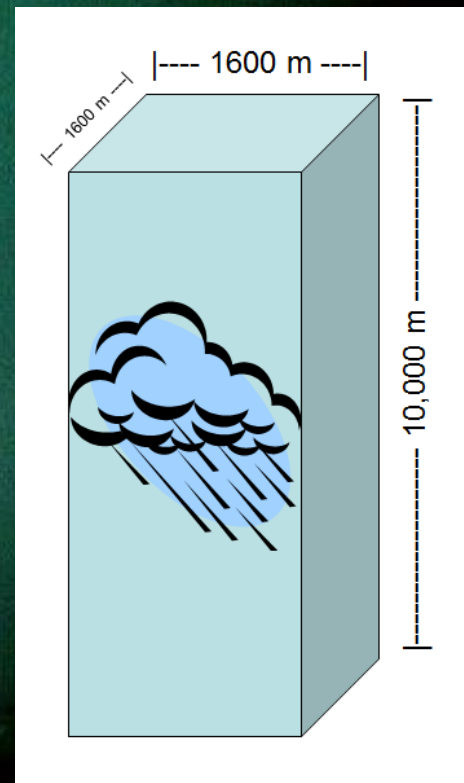
A time lapse of a strong thunderstorm that dropped a couple of wet microburst. One in particular was captured really well in the time lapse thanks to the sun peaking out to the west. Notice how the ball of rain falls from the sky and starts separating before hitting the ground. Once it hits the ground you can see the power of microburst as it expands similar to the ripple you would see when you drop a stone in water.



How much does the water in a typical thunderstorm weigh?

Southeast of Norman, Ok (Bill Bunting)





University of Virginia (2013) estimated:

1 cubic foot of water weighs ~ **62.31 pounds** (depending on temperature, contaminants, etc.)

A thunderstorm producing 1 inch of rain over 1 square mile holds:

~ **2,323,200 cubic feet of water**... weighing **144,758,592 pounds!**

That's 11,800 fully loaded 18-wheelers, 644 fully-loaded 747's,

or 68.65 Olympic-sized pools of water!

Southeast of Norman, Ok (Bill Bunting)



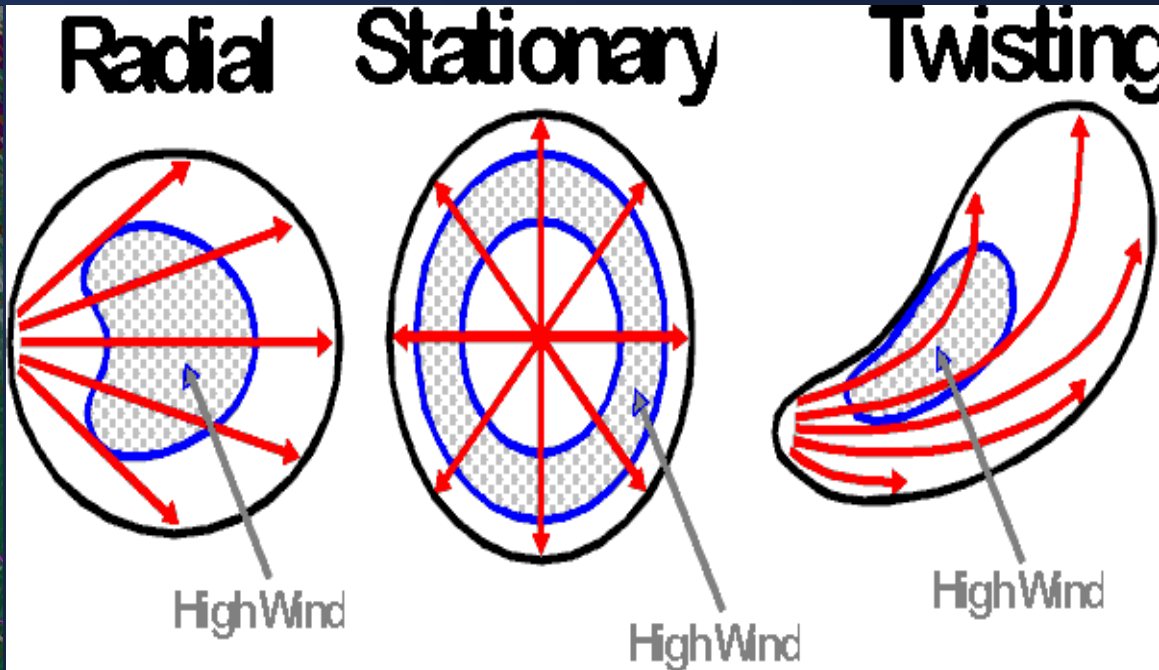
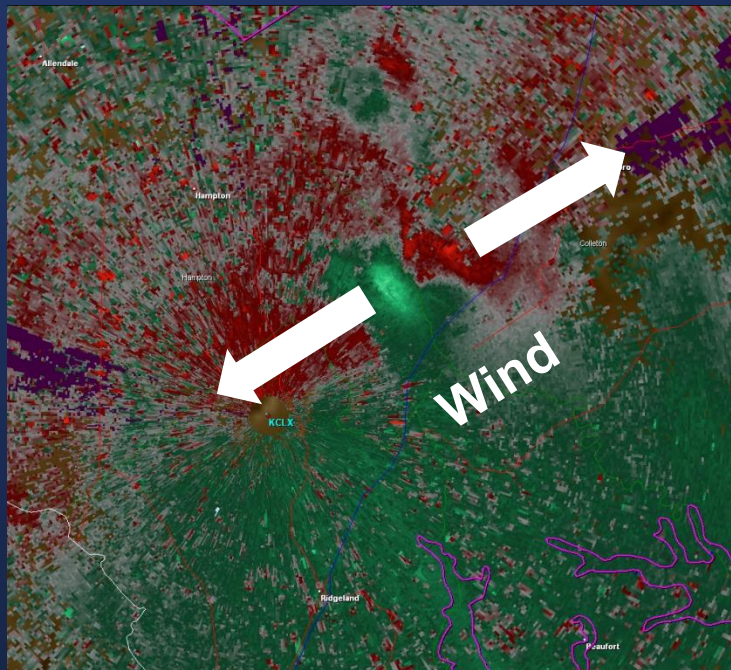
Severe Thunderstorm Winds

Downburst – Straight Line Winds

What do They Look Like?

On Radar – Difficult to Detect AND Warn For!

Damage Patterns on the Ground





Severe Thunderstorm Winds

Shelf Cloud

- Leading Edge of:
Strong Winds, Heavy
Rainfall, Hail
- Slope Down and Away from Rain
- Moves Away from Storm





Severe Thunderstorm Winds

Safety

- Go Into a Sturdy Shelter
- Lowest Level, Interior Room, Away from Windows
- Protect Your Head





Severe Thunderstorm Winds

Leave Mobile Homes in Severe Weather!

Mobile homes can roll in 80+ mph Winds





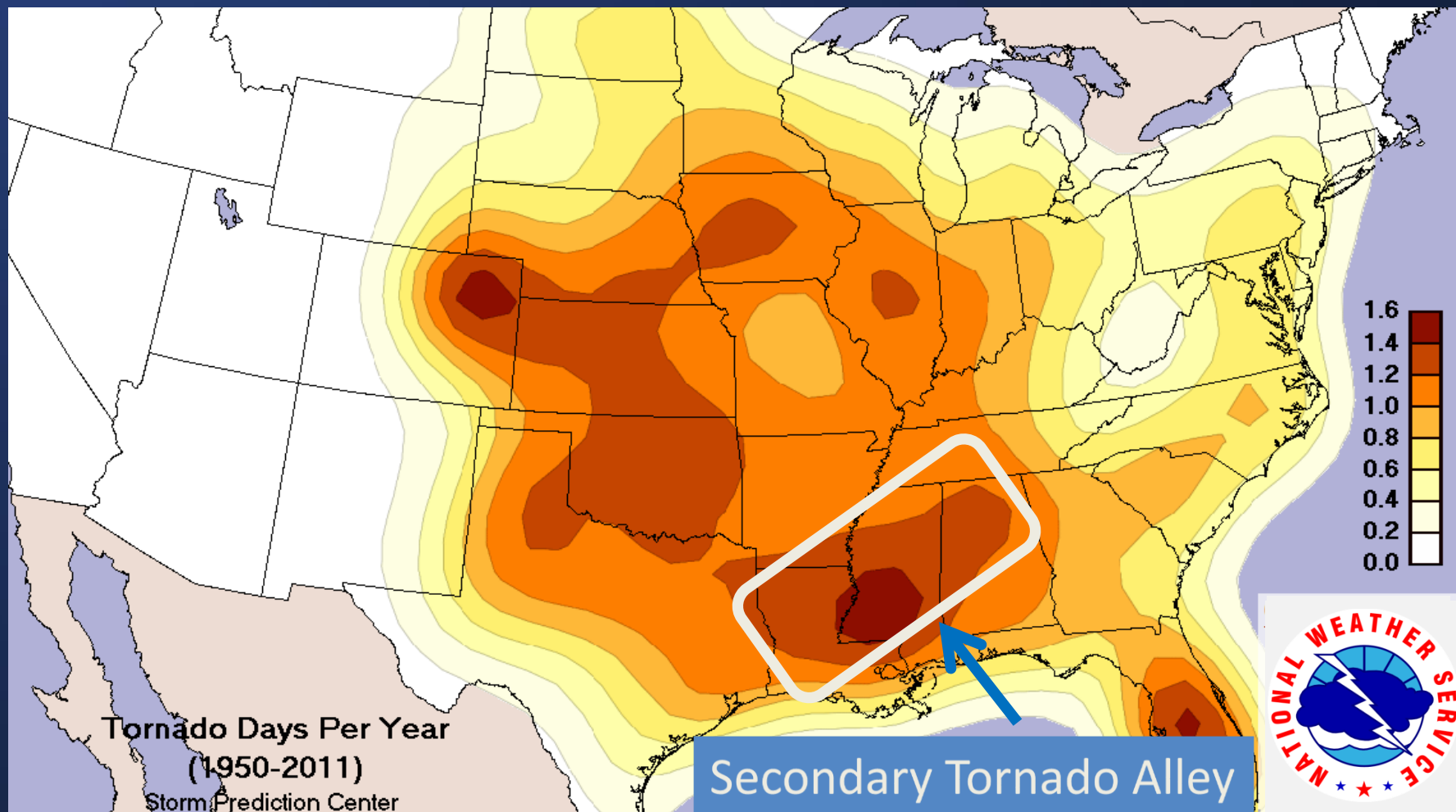
Tornadoes





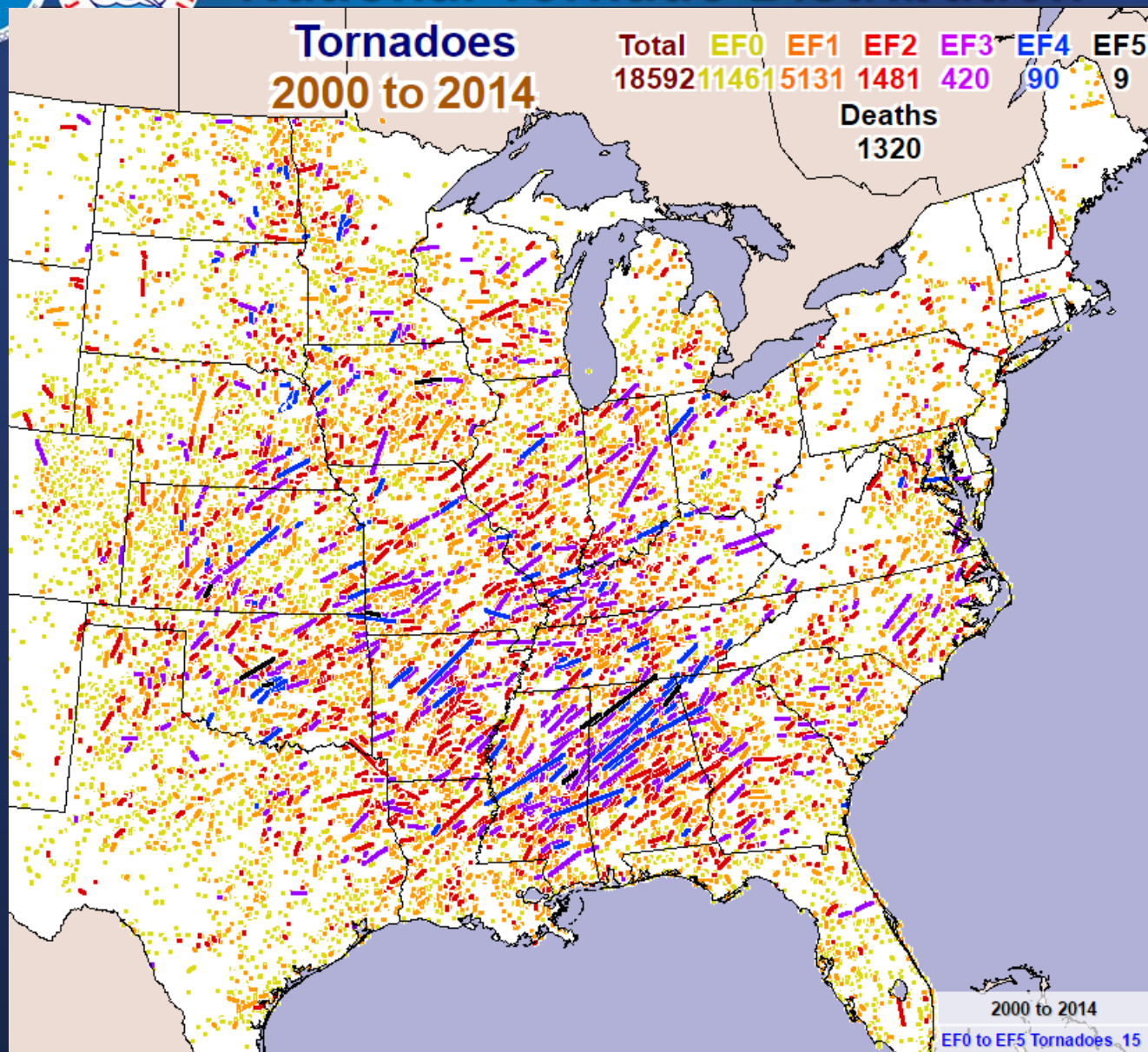
Tornado Distribution

Tornado Days Per Year





National Tornado Distribution





Funnel Cloud

Funnel Cloud: Rotating column of air from base of cloud – NO contact with ground



Funnel cloud

National Weather Service Forecast Office, San Antonio, TX

NOAA Central Library




Tornado

Tornado: Violently rotating column of air from a thunderstorm and in contact with the ground. Funnel may not be visible.

Look for debris

Keep your eye on the sky AND the ground!





SevereStudios.com
Andy Gabrielson

NWS/Traning Use Only - NOT FOR BROADCAST



Categories of Tornadoes

Intensity of Tornadoes:

- Based on the damage
- Winds NOT directly measured

Rated from EF0 – EF5
(Enhanced Fujita Scale)

Size ≠ Strength





Weak Tornadoes



- **EF0 and EF1** on the Enhanced Fujita Scale (65-110 mph)
- **88% + of All Tornadoes**
- **< 5% of all Tornado Deaths**
- **Brief Touchdowns, or Paths < Few Miles Long**



Weak Tornadoes

EF0 Damage



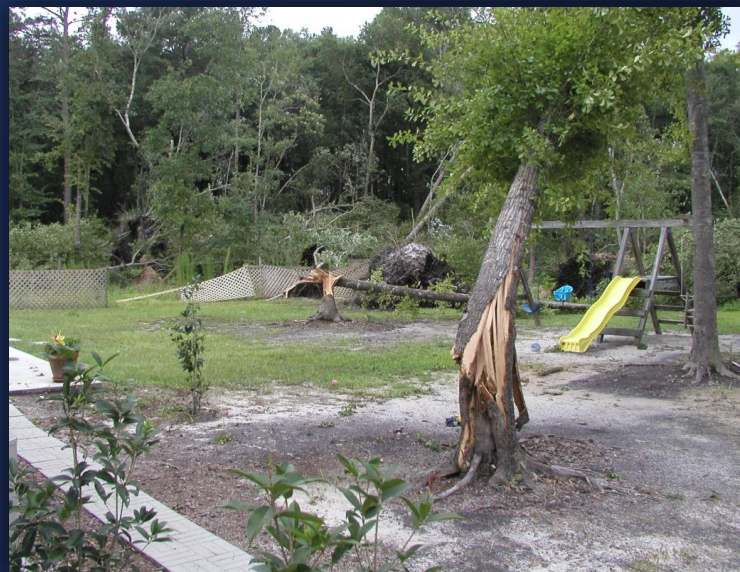
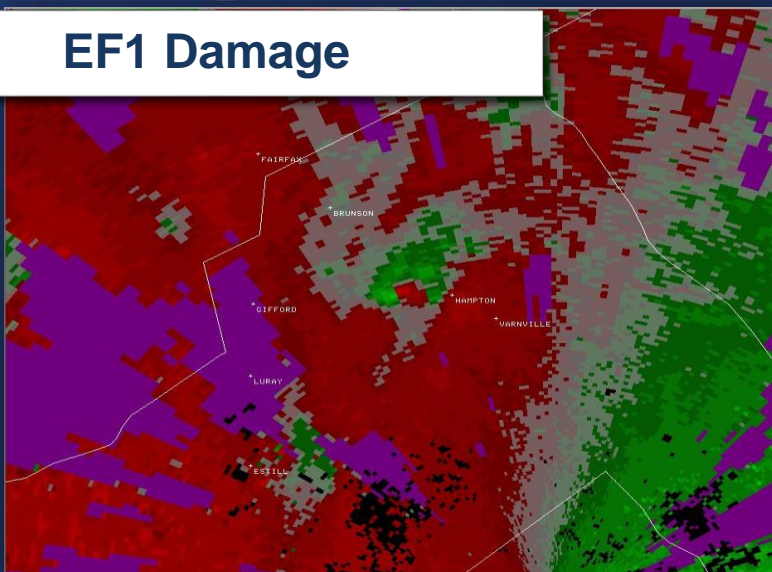
EF1 Damage





Weak Tornadoes

EF1 Damage





Strong Tornadoes

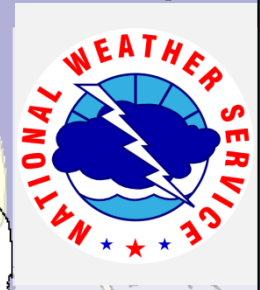
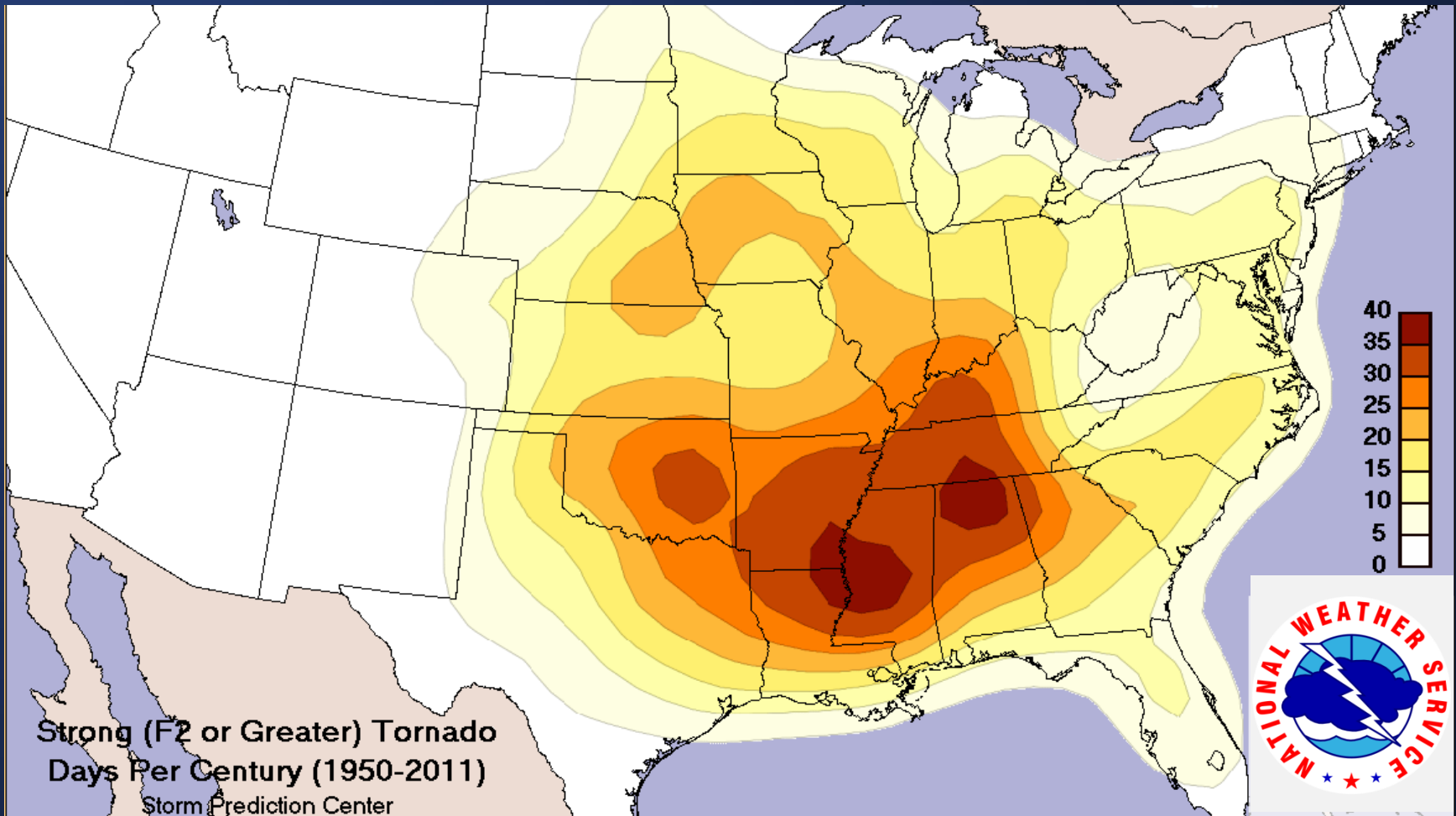


- **EF2 and EF3** (111-165 mph)
- **11% of All Tornadoes**
- **Up to 30% of Tornado Deaths**
- **Paths as Long as 10 - 15 Miles Long**



Strong Tornadoes

Probability of EF-2 or Greater Tornado (1950-2011)





Strong Tornadoes

EF-2 and EF-3 Damage





Violent Tornadoes

EF4 and EF5 (166-200+ mph)

**1% or Less of All
Tornadoes**

~70% of all Fatalities

**Paths May Be > 70 miles
Long, up to 1 mile Wide**

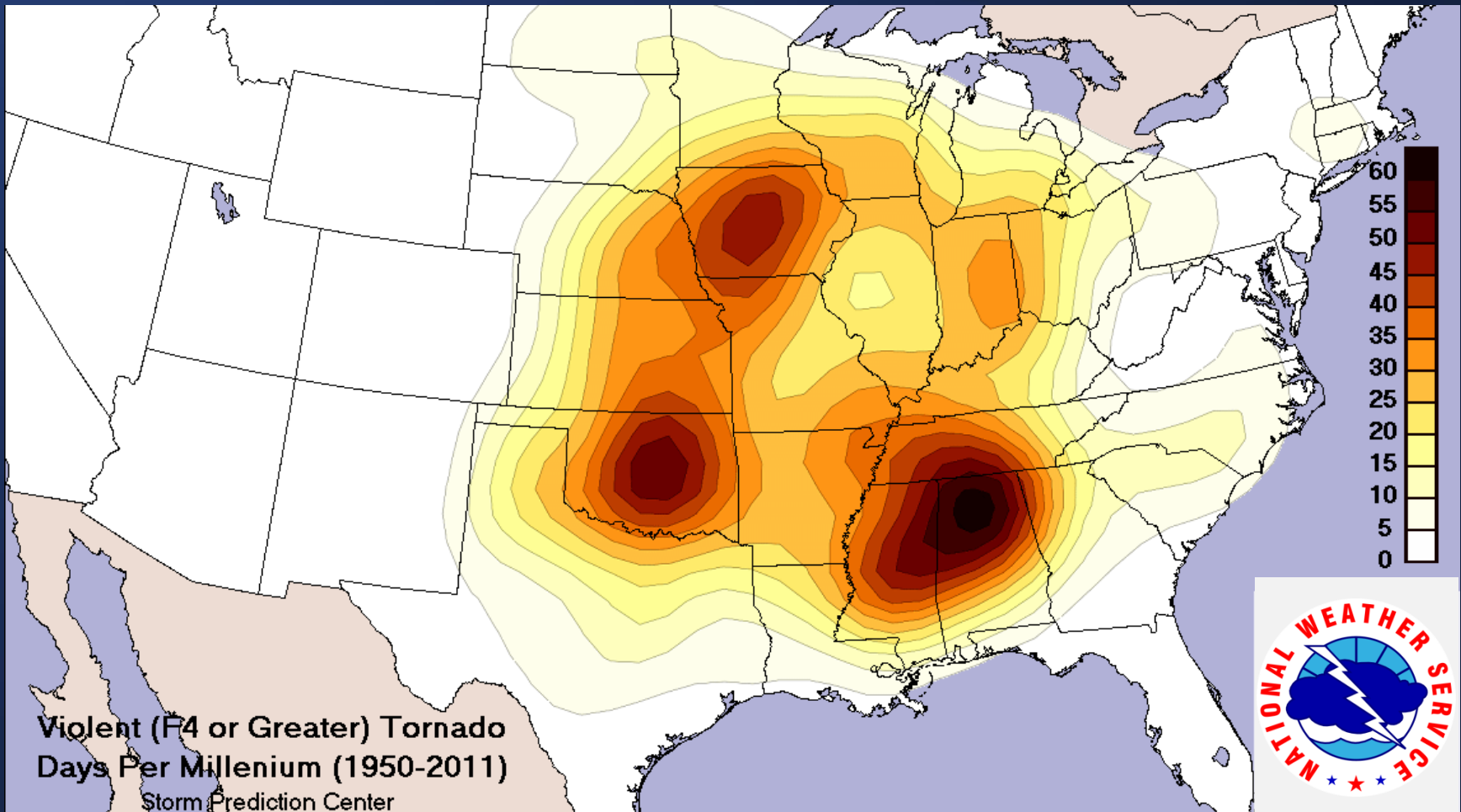


Photo by Doug Berry



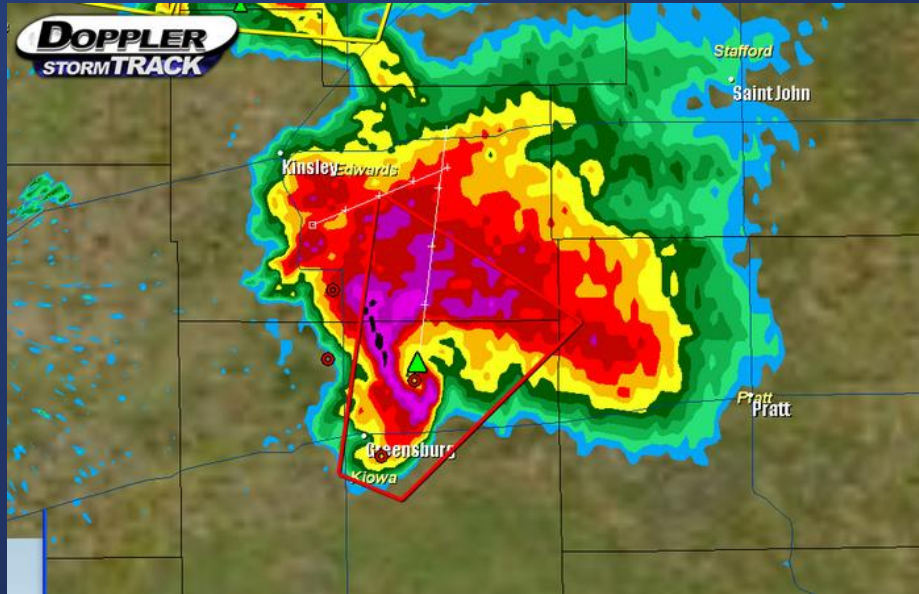
Violent Tornadoes

Probability of EF-4 or Greater Tornado (1950-2011)





EF5 Damage



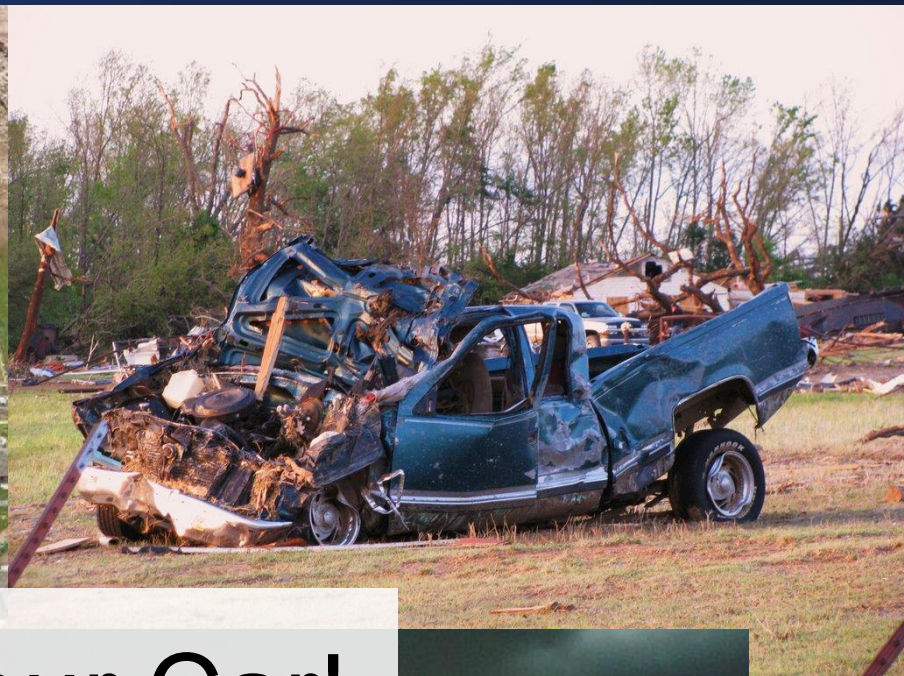
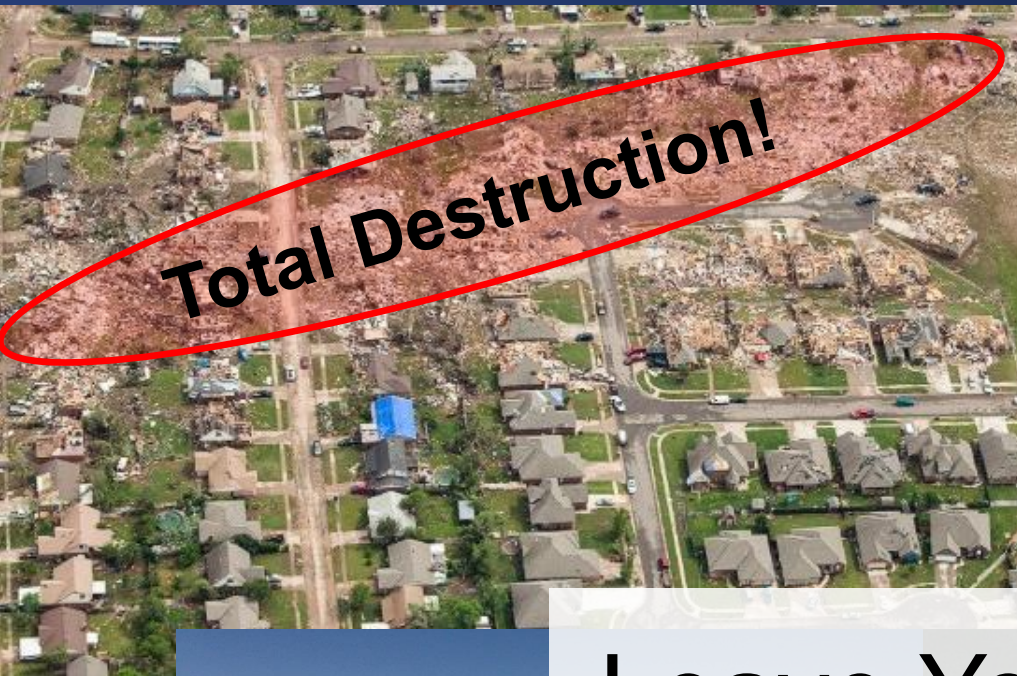
Asphalt Stripped Off Highway





EF5 Damage

Total Destruction!

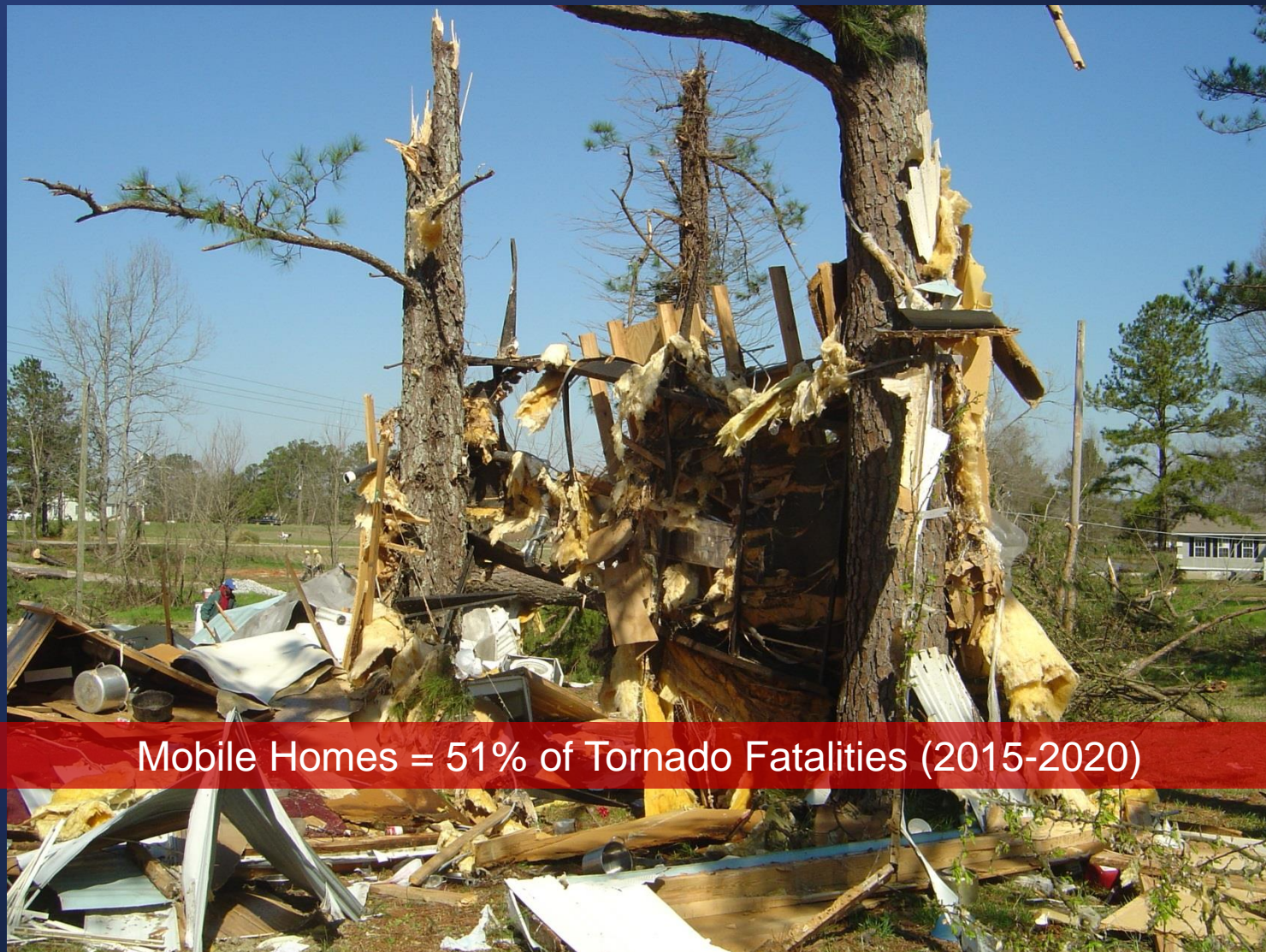


Leave Your Car!





Tornadoes



Mobile Homes = 51% of Tornado Fatalities (2015-2020)



Tornado Safety

- Seek Sturdy Shelter
- Interior Room, on Lowest Level
- Away From Windows
- Protect Your Head





Tornado Safety



All Survived in Interior Rooms or Closets!



Last But Not Least...

BRIDGES AND OVERPASSES ARE NOT SAFE STORM SHELTERS!



WHY IS TAKING
SHELTER UNDER A
BRIDGE OR AN
OVERPASS A BAD
IDEA?

- It provides NO protection from a tornado.
- You could block the road, exposing others to damaging hail or from reaching their safe shelter.

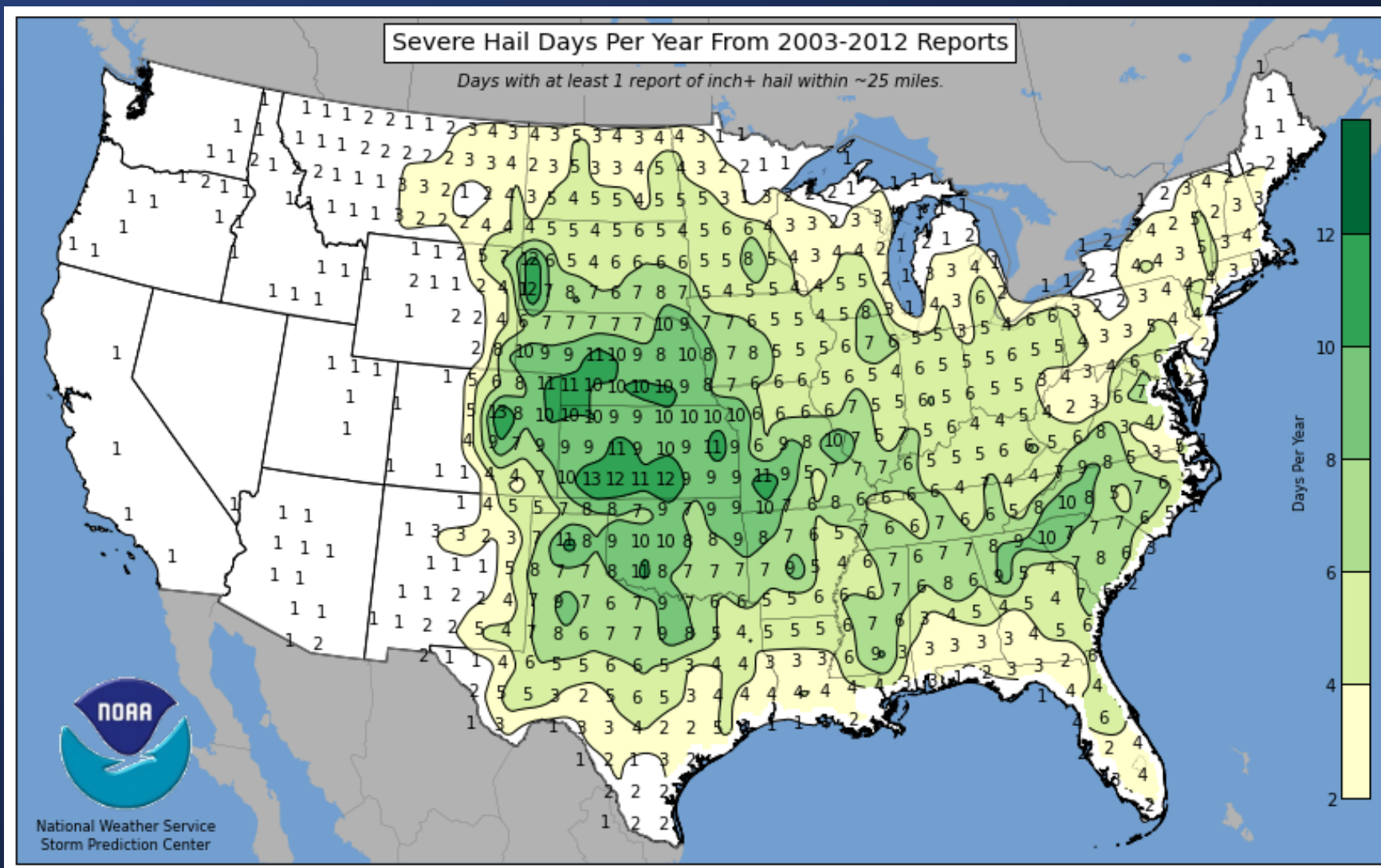


Hail





Severe Hail Distribution



Hail Formation

Hail Formation

Hail now too large to hold in cloud: falling to earth causing strong cold downdraught

Hail growing in circulating convection currents

Freezing Level

Rain drops being sucked into the updraft

- Chunks of Ice Falling From a Thunderstorm
- Size of Hail Indicates Storm Severity
- The Stronger The Updraft, The Stronger The Storm
- Please Report All Hail, Regardless Of Size!



Hail: Many Shapes and Sizes

Record

Vivian, SD Jul 23, 2010

Diameter: 8"
Weight: 1.94 lbs
Circumference: 18.62"



Typical Size Spectrum
Pea to Baseball





Warning Criteria for Hail

Severe Hail is 1" Diameter (Quarter Size) or Larger

Note: Report Hail of ANY Size!





Hail Damage

Car



Roof



Plants



Airplanes





Hail Damage: Trees and Shrubs





Hail Injuries and Safety



Move into a Sturdy
Structure:



Car, House, Building

Jogger Injured by 1.5"
Hail in Des Moines, IA
April 2010

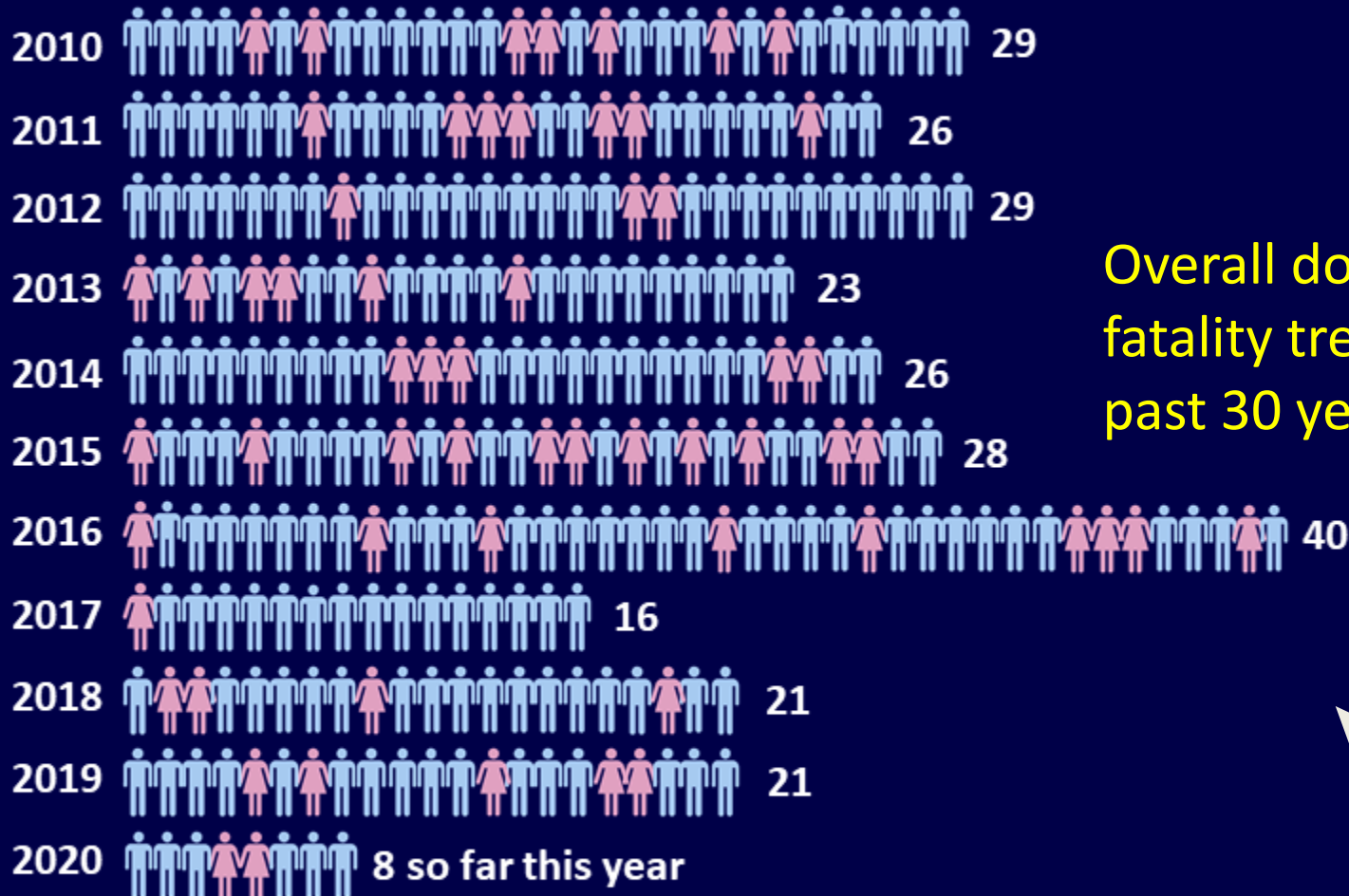
Photo courtesy
KCCI 8 – Des Moines





Lightning



U.S. Lightning Fatalities 2010-2020



Overall downward
fatality trend in
past 30 years

-207 -60

For more information:

lightningsafetycouncil.org/LSC-LightningFatalities.html

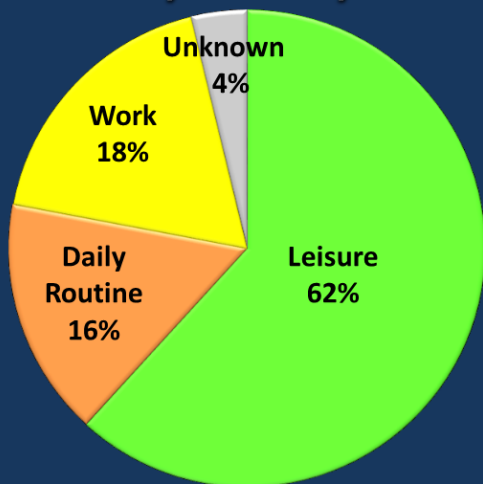
Compiled by
John Jensenius



Lightning Fatalities



Lightning Fatalities By Activity

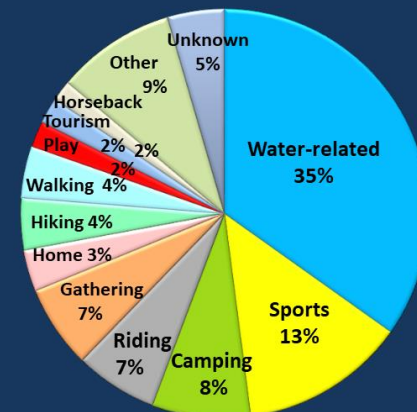


Based on 396 cases from 2006 through 2018

Compiled by
John Jensenius



Lightning Fatalities Leisure Activities

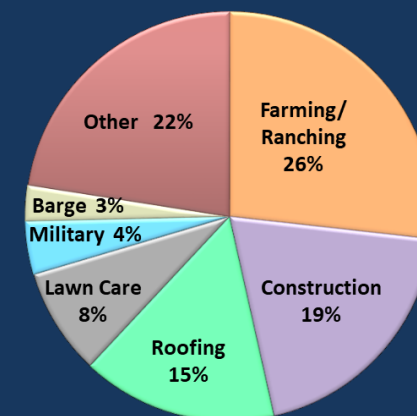


Based on 244 cases from 2006 through 2018

Compiled by
John Jensenius



Lightning Fatalities Work-Related Activities



Based on 72 cases from 2006 through 2018

Compiled by
John Jensenius



Lightning Facts



Photo by Doug Berry

- Bolt can heat the air to 50,000° F
- Causes an average of 30-60 U.S. deaths/year (70-80% male)
- After thunder...
5 sec ~ 1 mile





Lightning Facts



Lightning can strike “**Out of the Blue**”,
miles away from the thunderstorm!



Some Signs of a Lightning Strike

BEFORE Strike

- Hair stands on end
- May hear a buzzing or crackling sound

AFTER Strike

- Bark Striped off Tree
- Marks/Burns on Body
- Clothes/Shoes Burned
- Blown Electrical Outlets/Bulbs/Appliances



© Michael McQuillen





Lightning Safety Tips

- Avoid Being the Tallest Object
- Stay Away From Water and Metal
- Seek Protection in a Sturdy Structure
- Stay off Phones, Get Away from Windows & Appliances





Flooding





Flash Flooding

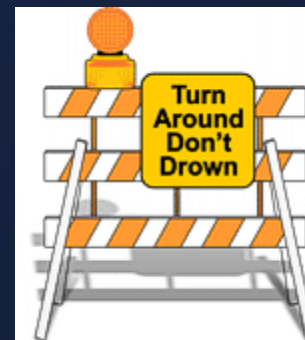
One of the Biggest Weather-Related Killers!

Don't Drive Through Low Water Crossings!

Rocky Branch at Whaley St 2017-03-30 16:02:21



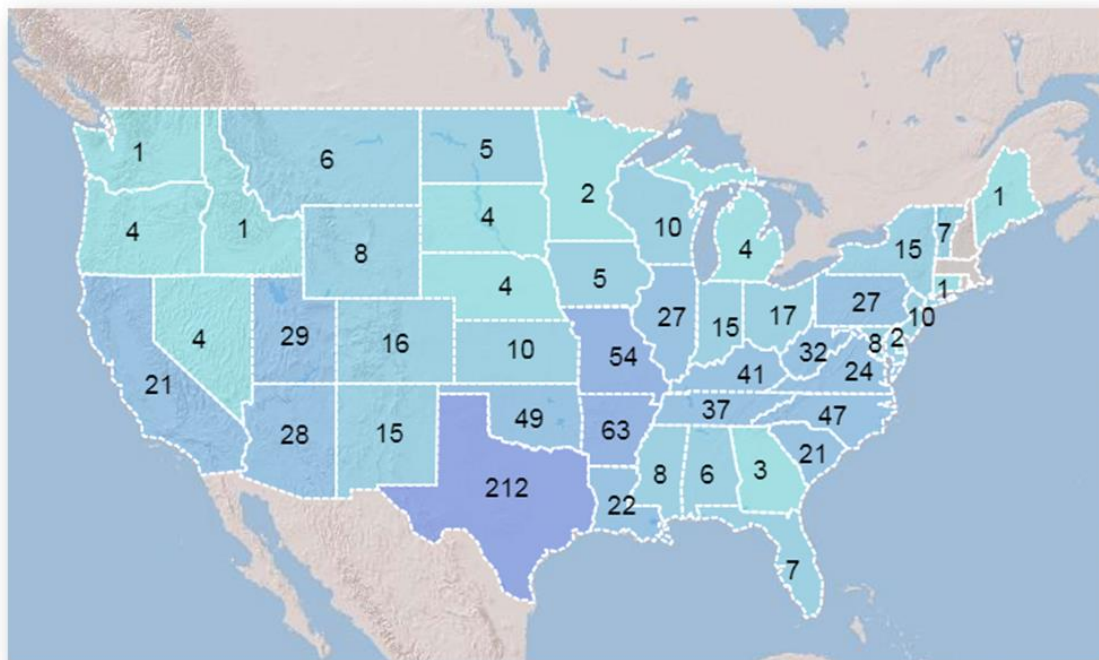
Nearly 1/2 of All Flash Flood-Related Deaths Involve Automobiles





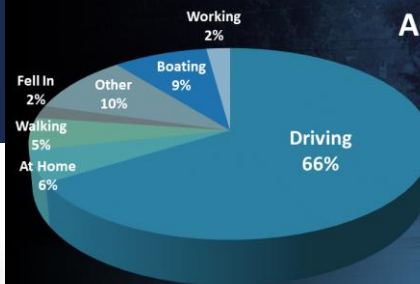
Flood Fatalities (# varies year to year)

2010-2018 U.S. Flood Fatalities



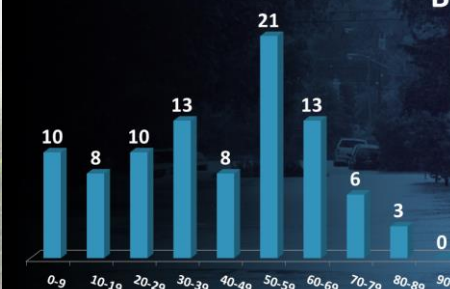
Source: NOAA/National Weather Service

2019 U.S. Flood Fatalities Activity of Victims



Source: NOAA/National Weather Service

2019 U.S. Flood Fatalities By Age Group



Source: NOAA/National Weather Service

2019 U.S. Flood Fatalities





Flooding: Hidden Dangers

- Hazardous Chemicals
- Snakes...
- Alligators...
- Drainage pipes...
- Glass...
- Sharp Objects...





Flash Flooding: Turn Around, Don't Drown





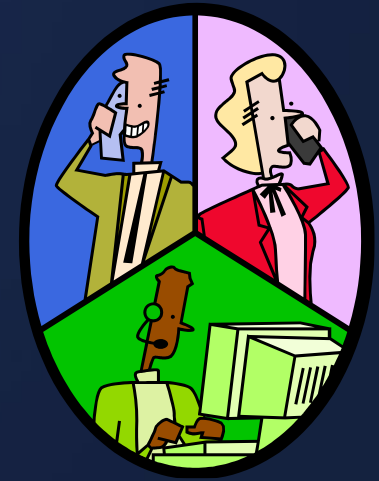
Outline

- National Weather Service Overview
- Why are Storm Spotters Important?
- Weather Hazards and Safety
- **Severe Weather Reporting Procedure**
- Outlooks/Watches/Warnings
- Monitoring Severe Weather



What To Report

- Measured or Estimated Winds 50+ mph
- Wind Damage (downed trees/tree limbs, power lines, cars, etc.)
- Tornadoes/Waterspouts
- Funnel Clouds
- Significant Flooding (roads impassable/closed, water into homes/businesses, etc.)
- Hail (any size)...report largest piece





What To Report

- **WINTER**
 - Snow accumulation in inches
 - Ice accumulation on trees, streets/roads, power lines
 - Sleet or freezing rain
 - Wind gusts (estimated or measured) 35+ mph
 - Poor visibilities in snow or blowing snow
 - Impassable or closed roads
 - Downed trees, branches or power lines
 - Any other winter storm-related damage or power outages





Severe Weather Reporting Procedures

- Use **TEL** Method for Your Report:

Time - When did it happen?

Event - What did you observe?

Location – Where did it occur?

Note: Address, nearest intersection or lat/lon for damage is VERY helpful!





Severe Weather Reporting Procedures

- **Examples of Reporting Wind Damage:**
 - If possible, measured wind gusts of 50+ mph
 - Can estimate strong winds using Beaufort Wind Scale
 - Downed power lines, trees or limbs (include diameter of tree or limbs)
 - Any structural damage, including the type of structure





Severe Weather Reporting Procedures



Reportable Hail Sizes

$\frac{1}{4}$ "	Pea
$\frac{3}{4}$ "	Penny
0.88"	Nickel
1"	Quarter
$1\frac{3}{4}$ "	Golf ball
$2\frac{1}{2}$ "	Tennis ball
$2\frac{3}{4}$ "	Baseball
4"	Grapefruit

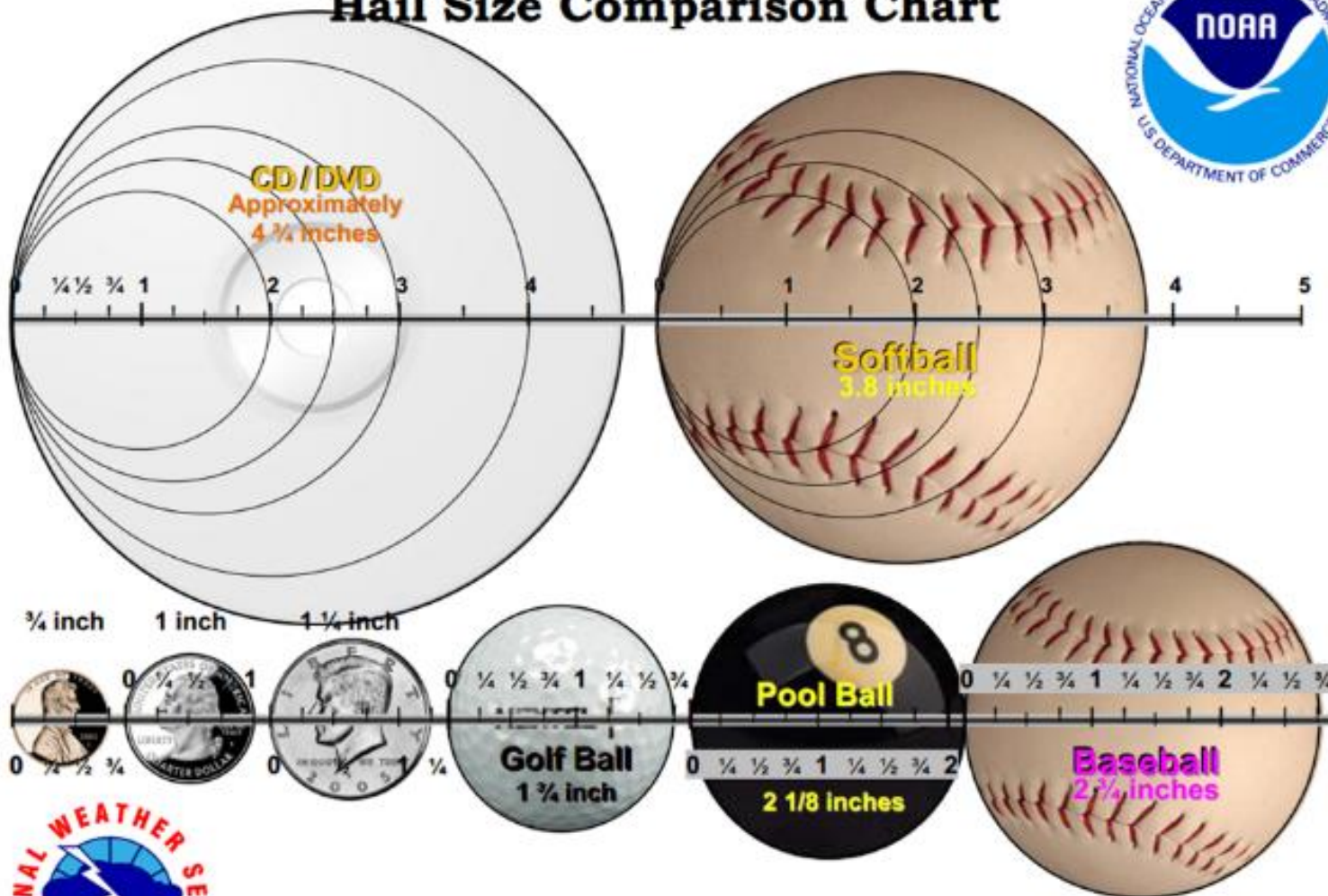


July 23, 2010
Vivian, SD
8" diameter
1.9 lbs



Severe Weather Reporting Procedures

Hail Size Comparison Chart



Produced by Michael S. Lewis, NOAA, National Weather Service, Northern Indiana



Measuring Freezing Rain



- Ideally you will find a flat metal object and measure the thickness directly
- Second method is to find a twig coated by ice.
 - *Measure the distance between the two yellow areas on each side.*
 - *Then divide by two.*
 - $\frac{1}{4}'' + \frac{1}{4}'' = \frac{1}{2}'' / 2 = \frac{1}{4}''$ ice





Severe Weather Reporting Procedures - Winter



Six Basic Steps for Properly

MEASURING SNOW



Accurate and timely snowfall measurements are extremely important to your National Weather Service office, your community, local media, and many others. Here are the six steps you need to know for measuring snow:

3

Set-up



Set up before snow begins

Put your board out and mark it with the flag

4

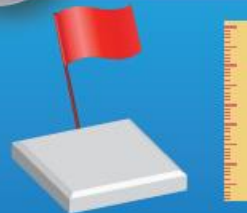
Measuring Snow



Measure once daily at the same time, after measuring place the board on top of snow

1

Supplies



Ruler or yard stick
24" X 24" white board, flag

2

Planning



Find an open area away from tall objects, but sheltered from wind

5

When Snow Stops



Measure as soon as the snow stops to avoid lower totals due to melting, settling and drifting

6

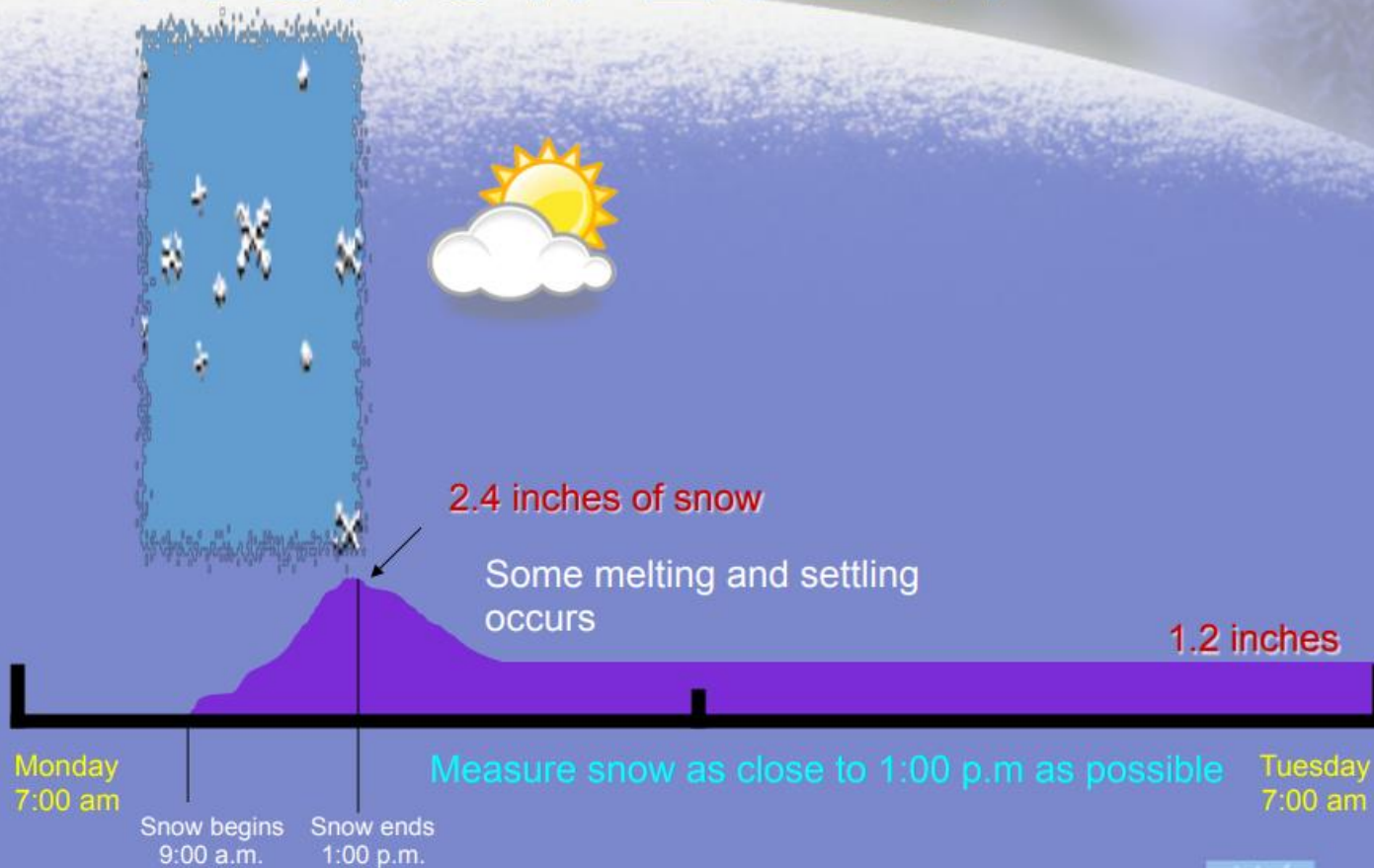
Reporting





Severe Weather Reporting Procedures - Winter

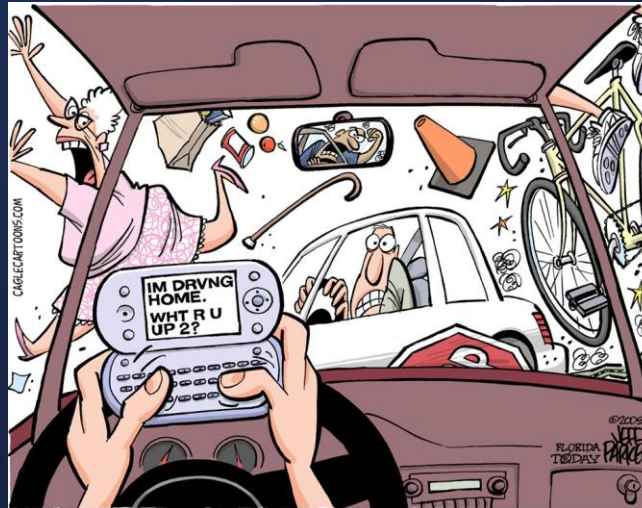
A SNOW EVENT





Severe Weather Reporting Procedures

- Report Severe Weather and/or Damage from any location!
 - Home, shopping, work, vacation, etc.
- Don't chase the weather!
- Remember...Safety First!
- If in a car – pull over before sending report
- We will relay your report to proper NWS office if needed





mPING

mPING

crowdsourcing weather reports

What happened to the mPING app? On July 7, 2020, mPING was flooded with false weather reports and was shut down temporarily. We are working to eliminate vulnerabilities that allowed these false reports to be submitted. However, this may require some time. Once the app is updated, everyone will have the ability to submit mPING weather reports and view the interactive map of mPING reports. We appreciate everyone's patience as we resolve these vulnerabilities. The mPING project is a citizen science collaborative effort led by CIMMS and NOAA NSSL.

Are raindrops falling on your head?

Are you getting hassled by hail? Is snow glistening in your treetops? We need your weather reports for our research!

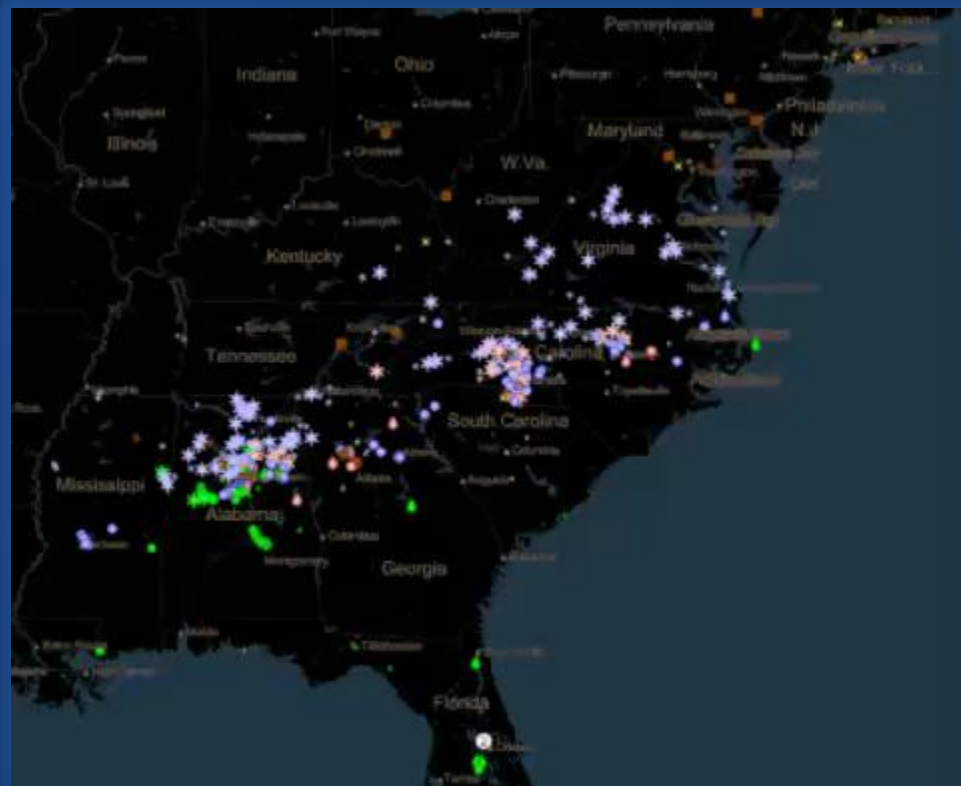
GET THE mPING APP!

The NOAA National Severe Storms Laboratory is collecting public weather reports through a free app available for smart phones or mobile devices. The app is called "mPING," for *Meteorological Phenomena Identification Near the Ground*.

[Download an mPING fact sheet \(.pdf, 458 kB\)](#)



<https://mping.nssl.noaa.gov/>





How to Report

**Web:**

<http://weather.gov/cae>

**Phone (unlisted):**

(Given during spotter training)

**E-mail:**

NWS.Columbia@noaa.gov

**Facebook:**

NWSColumbia

**Twitter:**

@NWSColumbia



How to Report

And of course... *Amateur Radio!*





How to Report

* **Primary Use Repeaters**
 + **SCHEARTS Repeaters**
 (+ = Monitored but SKYWARN must not interfere with ARES/RACES/EMD)



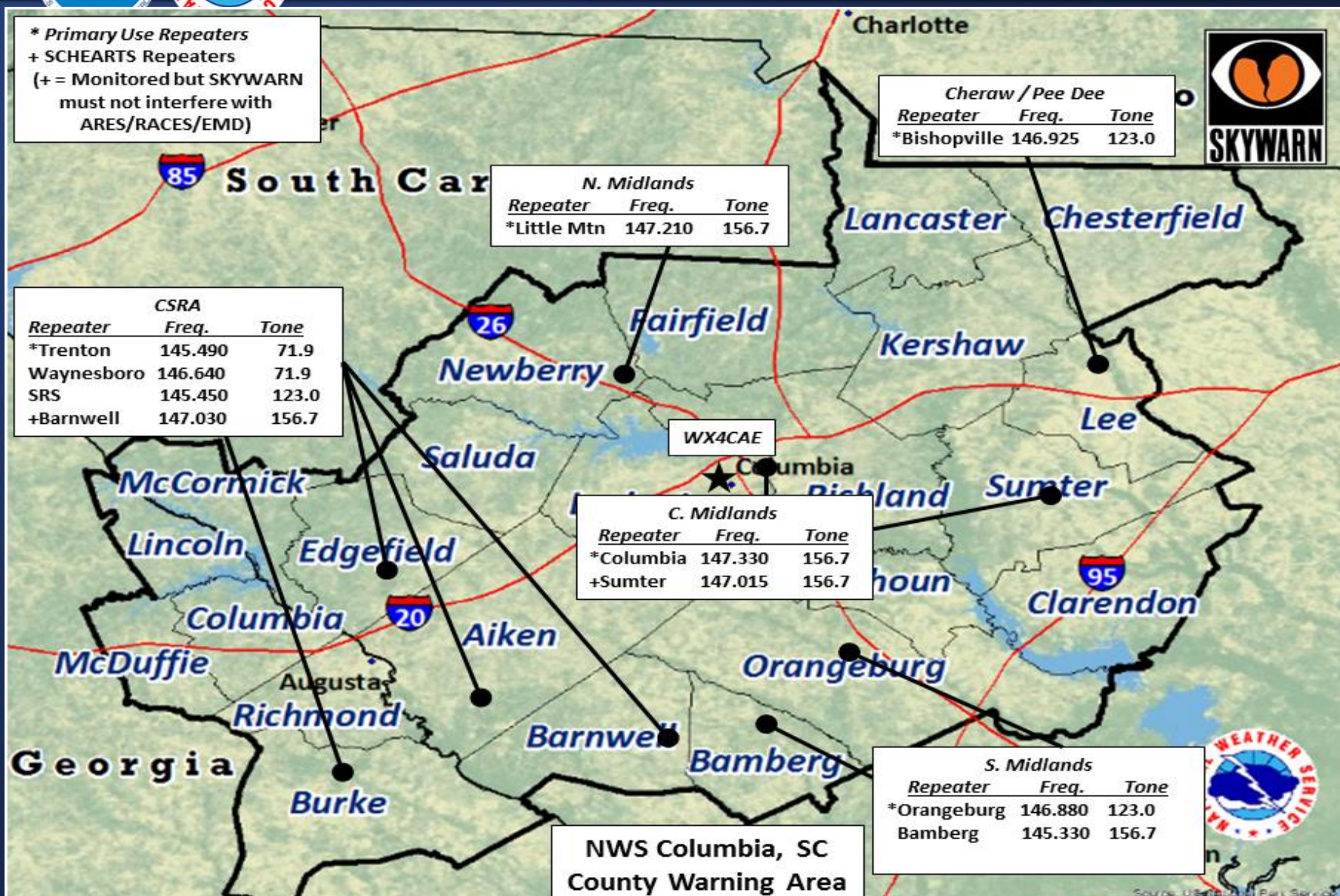
Cheraw / Pee Dee		
Repeater	Freq.	Tone
*Bishopville	146.925	123.0

N. Midlands		
Repeater	Freq.	Tone
*Little Mtn	147.210	156.7

CSRA		
Repeater	Freq.	Tone
*Trenton	145.490	71.9
Waynesboro	146.640	71.9
SRS	145.450	123.0
+Barnwell	147.030	156.7

C. Midlands		
Repeater	Freq.	Tone
*Columbia	147.330	156.7
+Sumter	147.015	156.7

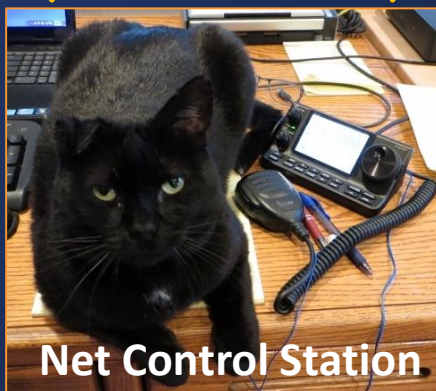
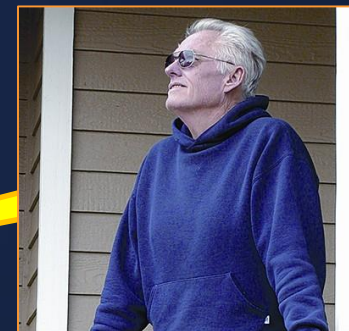
S. Midlands		
Repeater	Freq.	Tone
*Orangeburg	146.880	123.0
Bamberg	145.330	156.7



**NWS Columbia, SC
 County Warning Area**



Ideal CAE SKYWARN Ham Operations



**Unlisted SKYWARN Phone
(Secondary)**

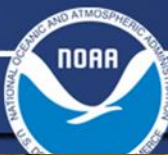


NWS Chat (Internet – PREFERRED)

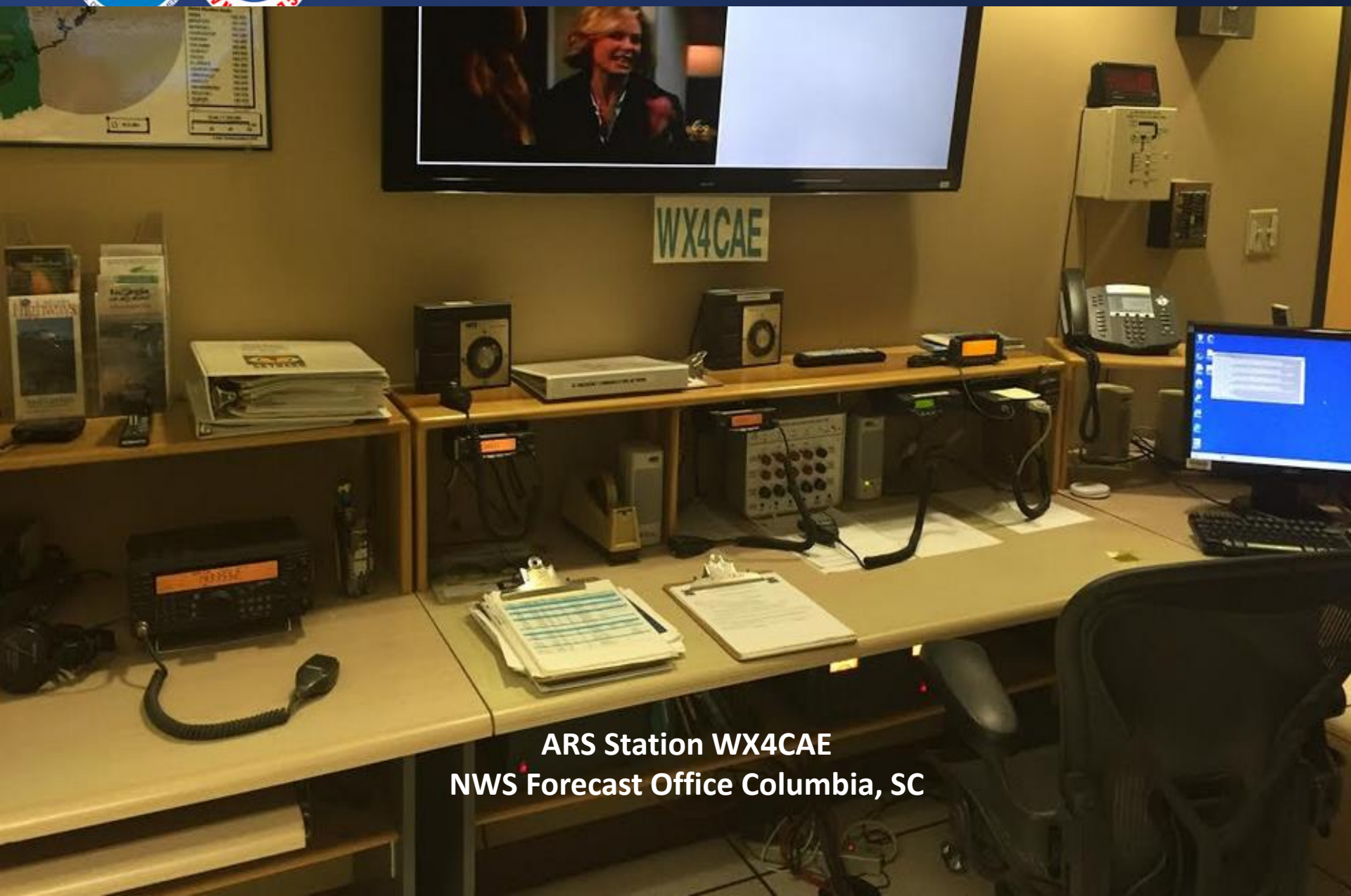


WX4CAE (rarely activated)





WX4CAE

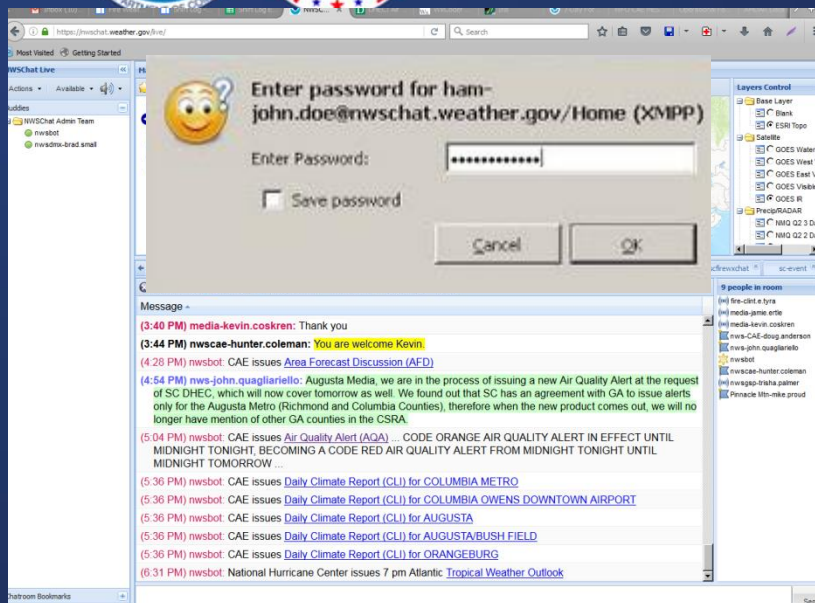


ARS Station WX4CAE
NWS Forecast Office Columbia, SC

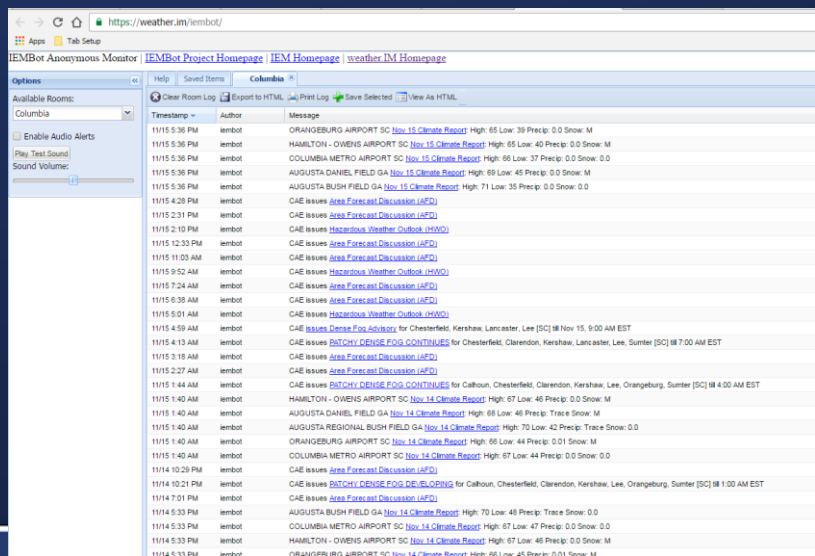




NWSChat... A MUST for NCS Stations



- SKYWARN Net Controllers should request an NWS Chat account.
 - Best way to pass reports directly to the NWS Office if not there.
 - <https://nwschat.weather.gov/>
 - Our chat room is **caechat**
 - I'm happy to help you set up an account



- IEMBot is a way for anyone to monitor any NWSChat forecast office chat room.
 - All watches/warnings/advisories along with many other products and notifications.
 - <https://weather.im/iembot/>



You Make the Call

You make
the call





What Would You Report?





Example of Severe Weather Report

- My name is John Doe
- I am a trained spotter located 2 miles N of Aiken (provide lat/lon, address or nearest intersection if possible)
- I see a Tornado 2 miles to my west, moving to the NE.
- We also had Golfball size hail at my location.
- It began at 6:35 pm and lasted for 5 minutes.
- You can call 803-555-1234 if you have any questions.



What Would You Report?

Tornado, Downburst,
Rain Shaft...?





What Would You Report?



Tornado or Updraft?

Updraft! Look for Rotation. If NOT Rotating → NOT a Tornado.



What Would You Report?



Tornado or Rain Shaft?

Rainshaft. You would notice NO rotation!



What Would You Report?

© 2000 Tim Marshall



Scud Cloud! Can be common on very warm/humid days in the SE.
Cloud bases can also be very low. Look for rotation!



What Would You Report?



Tornado! The funnel is embedded in very heavy precipitation, but is a tornado. The observer noticed strong rotation and power flashes in the circled area, and reported the tornado.



Outline


- National Weather Service Overview
- Why are Storm Spotters Important?
- Weather Hazards and Safety
- Severe Weather Reporting Procedure
- **Outlooks/Watches/Warnings**
- Monitoring Severe Weather



Outlooks/Watches/Warnings

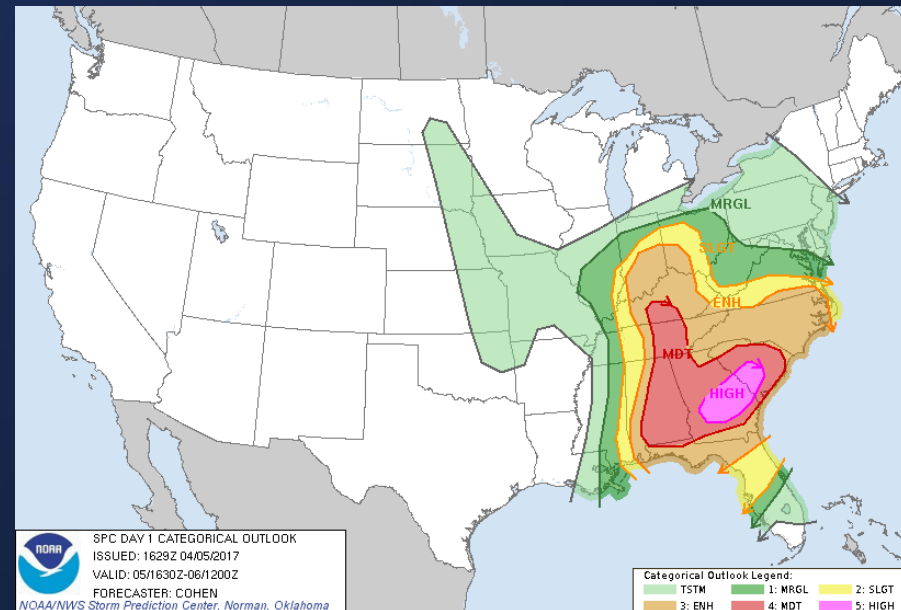
- **Outlooks:** Know Your Risk!
- Issued by the Storm Predictions Center (SPC)
- Outlooks go out 7-days, but provide more detail in the first one to three days.

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with all thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.

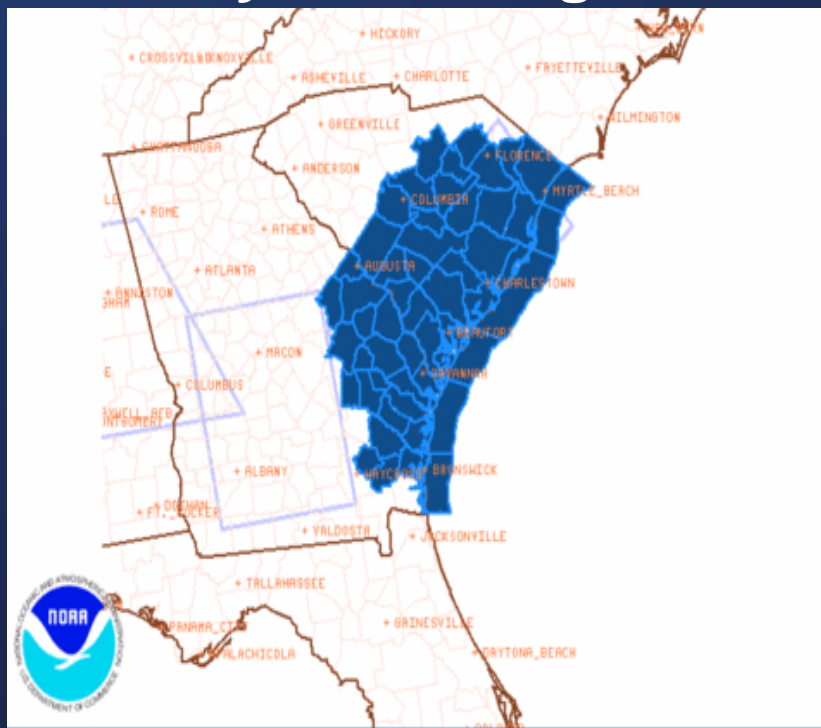
National Weather Service
www.spc.noaa.gov





Outlooks/Watches/Warnings

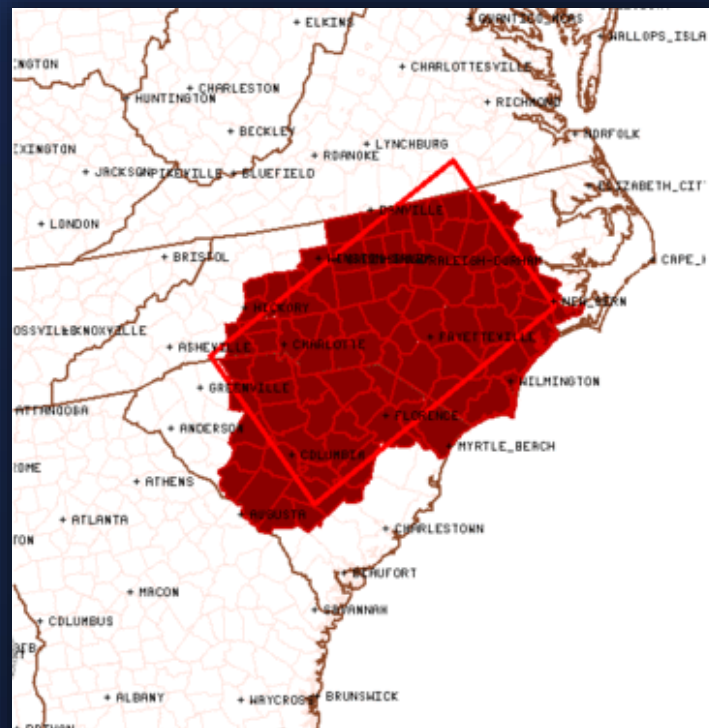
- **WATCH:** Conditions favorable for severe weather. *Be prepared to take action!*
- Issued by the Storm Predictions Center (SPC)
- Usually cover large areas for 4-6 hours



Severe Thunderstorm Watch # 548 - Valid from 300 PM until 1000 PM EDT

NWS/Storm Prediction Center

Updated: 20070720/19



Tornado Watch # 26 - Valid from 1115 AM until 700 PM EST

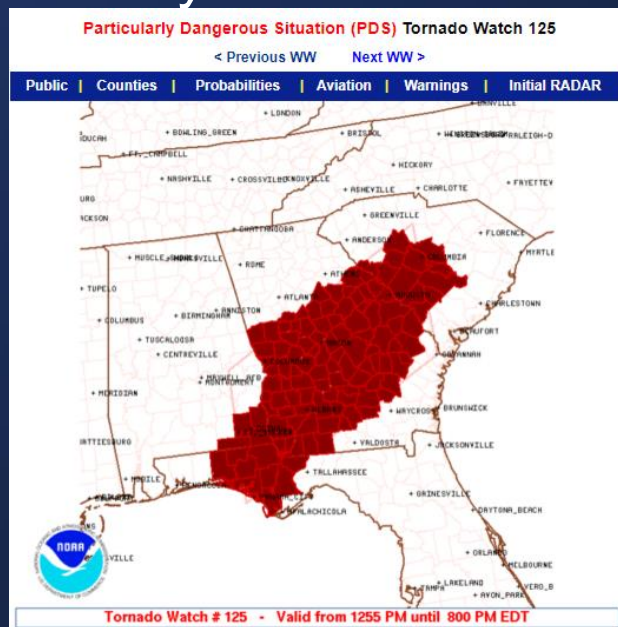
Storm Prediction Center

Updated: 2



Outlooks/Watches/Warnings

- **Particularly Dangerous Situation (PDS) Watch:** there is an enhanced risk of severe and life-threatening weather, usually a major tornado outbreak or a long-lived extreme derecho event.
- Very infrequent: generally about 3% of all watches issued

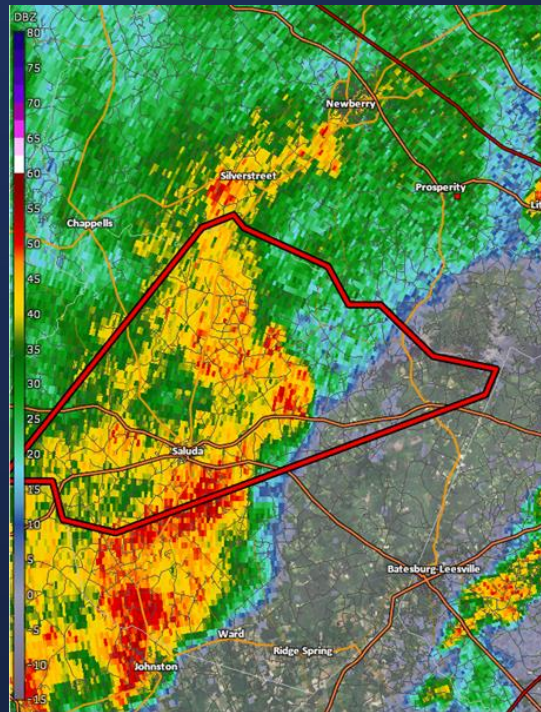


Hazard	Tornadoes	EF2+ Tornadoes	Severe Wind	65 kt+ Wind	Severe Hail	2"+ Hail
Likelihood	High	High	High	Moderate	High	Moderate



Outlooks/Watches/Warnings

- **WARNING:** Severe weather imminent or occurring. *Seek shelter now!*
- Issued by the local NWS office
- Usually cover a portion of a county or counties and in effect for 45-60 minutes



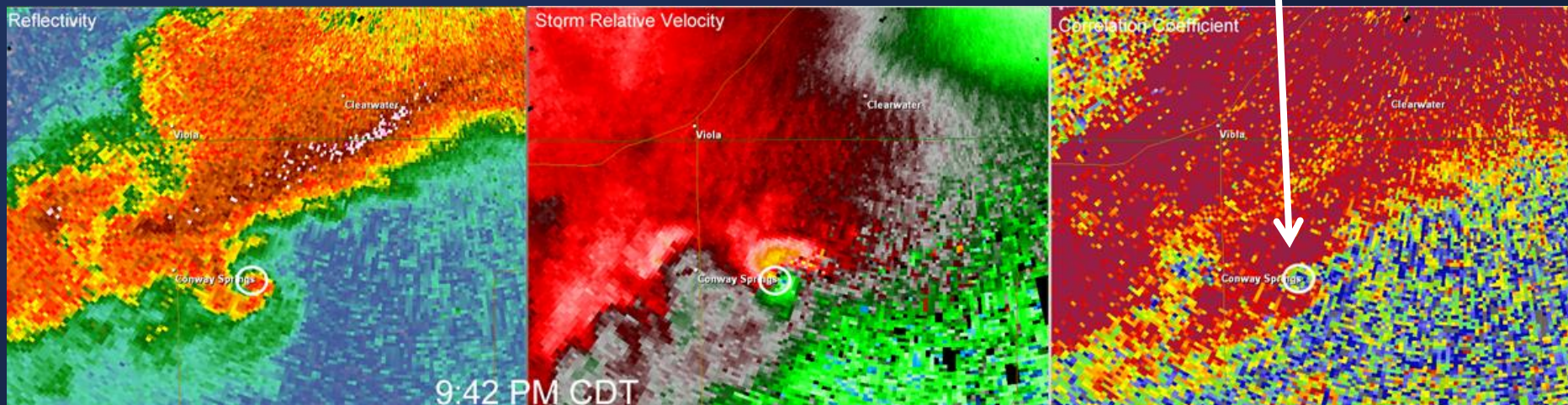


Outlooks/Watches/Warnings

WARNING Terms to Know...

- **Radar Confirmed Tornado:**
 - a tornado debris signature (TDS) or a **debris ball** on radar is caused by debris lofting into the area, usually associated with a tornado
 - with this signature on radar, NWS will use “Radar Confirmed Tornado” in warning products to confirm that a tornado is occurring

5/24/2017 2:41 PM EDT, Saluda/Edgefield Counties





Outlooks/Watches/Warnings

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 330 PM EDT FOR SOUTHWESTERN FAIRFIELD...SOUTHEASTERN NEWBERRY...NORTHWESTERN LEXINGTON...NORTHEASTERN SALUDA AND NORTHWESTERN RICHLAND COUNTIES...

At 308 PM EDT, a confirmed tornado was located near Prosperity, or 9 miles south of Newberry, moving northeast at 40 mph.

HAZARD...Damaging tornado.

SOURCE...Radar confirmed tornado.

IMPACT...Flying debris will be dangerous to those caught without shelter. Mobile homes will be damaged or destroyed. Damage to roofs, windows, and vehicles will occur. Tree damage is likely.

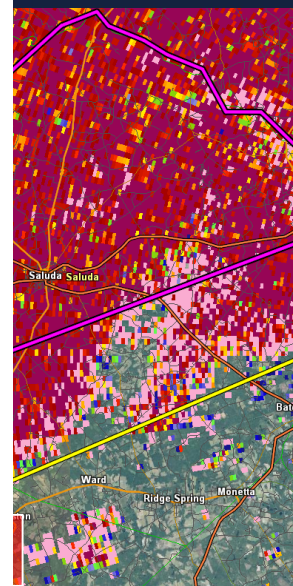
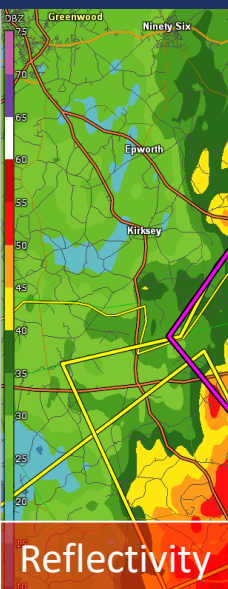
This tornado will be near...
Prosperity around 320 PM EDT.

Other locations impacted by this tornadic thunderstorm include Peak, Little Mountain, Chapin, Pomaria and Lake Murray Of Richland.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a tornado is on the ground. TAKE COVER NOW! Move to a basement or an interior room on the lowest floor of a sturdy building. Avoid windows. If you are outdoors, in a mobile home, or in a vehicle, move to the closest substantial shelter and protect yourself from flying debris.

5/24/2017





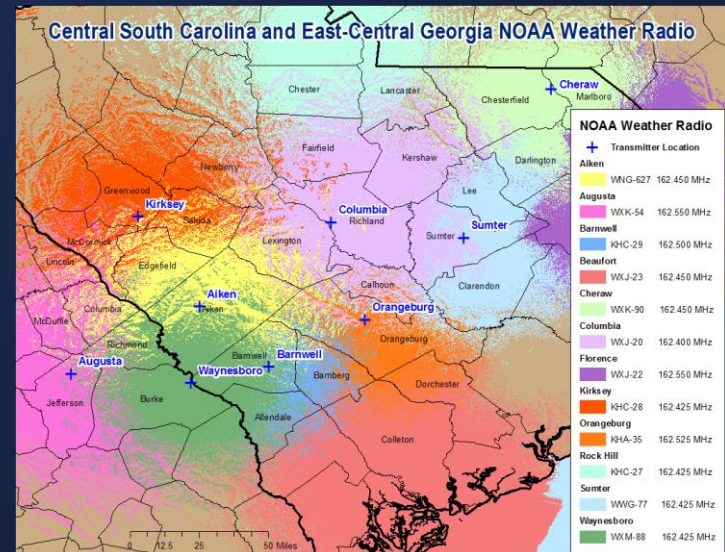
Outline

- National Weather Service Overview
- Why are Storm Spotters Important?
- Weather Hazards and Safety
- Severe Weather Reporting Procedure
- Outlooks/Watches/Warnings
- **Monitoring Severe Weather**



Staying Informed

- **NOAA Weather Radio All-Hazards (NWR)**
 - Nationwide network of radio stations broadcasting weather information directly from National Weather Service 24 hours a day.
 - In conjunction with Federal, State, and local EM's and other public officials, NWR broadcasts warnings and information for all types of hazards:
 - Natural (weather, earthquakes, etc.)
 - Environmental (chemical releases or oil spills)
 - Public Safety (Civil Emergency Messages, AMBER alerts, 911 telephone outages, etc.)

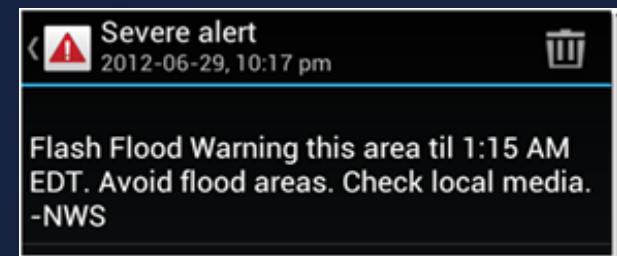
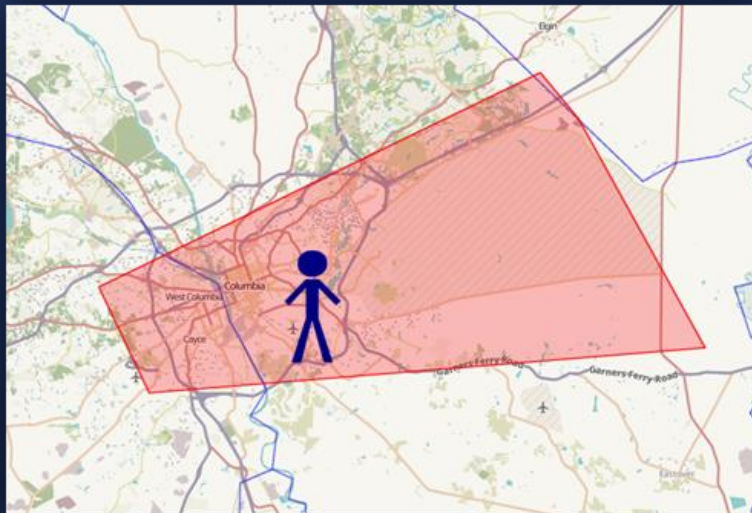




Staying Informed

• Wireless Emergency Alerts:



- Sent by authorized government authorities (including NWS)
- Automatically sent to mobile device (no app or subscription needed)
- Uses radio technology to broadcast the alert from cell towers to mobile devices in the area of threat





Staying Informed

- Wireless Emergency Alerts:



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Current NWS WEA Messages (English)

Warning Type	WEA Message
Tsunami Warning	NWS: TSUNAMI danger on the coast. Move to high ground or inland now.
Tornado Warning	NWS: TORNADO WARNING in this area til hh:mm tzT. Take shelter now. Check media. -- or -- NWS: TORNADO EMERGENCY til hh:mm tzT. Tornado spotted in this area. Take shelter now!
Extreme Wind Warning*	NWS: EXTREME WIND WARNING this area til hh:mm tzT. Take shelter now.
Hurricane Warning	NWS: HURRICANE WARNING this area. Check media and local authorities.
Typhoon Warning	NWS: TYPHOON WARNING this area. Check media and local authorities.
Storm Surge Warning*	NWS: Life-threatening STORM SURGE danger. FOLLOW THE INSTRUCTIONS OF LOCAL OFFICIALS.
Snow Squall Warning*	Snow Squall Warning til hh:mm tzT. Sudden whiteouts. Icy roads. Slow down!
Flash Flood Warning	NWS: FLASH FLOOD WARNING this area til hh:mm tzT. Avoid flood areas.
Dust Storm Warning	NWS: DUST STORM WARNING til hh:mm tzT. Be ready for a sudden drop to zero visibility.

Legend
tzT = timezone

*Availability is dependent on wireless carrier

NWS Office of Dissemination1

Extreme

Severe



Thank You for Attending!

<https://weather.gov/cae/register>

- Register as a Spotter to enter our database
- Receive your spotter certificate
- May infrequently be contacted for severe weather reports

