

Photo: Sherri George

Photo: Chris Kerr

# Basic SKYWARN® Weather Spotter Training Webinar



National Weather Service  
Charleston, WV





## Tony Edwards

Warning Coordination Meteorologist  
NOAA/National Weather Service  
Charleston, WV

Email: [Tony.Edwards@noaa.gov](mailto:Tony.Edwards@noaa.gov)

**Warning Coordination Meteorologist:** Serves as the principal interface between the Weather Forecast Office and the users of its products and services in leading the effort to insure their evaluation, adjustment, and improvement.



# Spotter Training Objectives

**At the conclusion of this course, you should be able to:**

- **Describe your community's severe weather threats**
- **Understand the role of a weather spotter and how important they are to NWS operations**
- **Properly define a severe thunderstorm and identify basic thunderstorm structure and clues to tornado development**
- **Provide accurate and timely reports of severe weather, increasing the weather readiness of your community**
- **Implement a severe weather safety plan**



# Spotter Training Outline

## **Section 1: Lessons from the Past**

- Tornado history and climatology

## **Section 2: The Role of the Weather Spotter**

- National Weather Service – Who We Are and What We Do
- Why We Need Spotters?
- How and What to Report

## **Section 3: Thunderstorms**

- Ingredients...Anatomy...and Varieties
- Severe Thunderstorm Spotting Concepts
- Cloud Identification

## **Section 4: Staying Safe in Severe Weather**

- Outlooks, Watches and Warnings – Oh my!
- Severe Weather Risk Awareness Resources and Apps
- Safety Basics

## **Section 5: Winter Weather Spotting**

## **Section 6: Review & Quiz**



# Lessons from the Past

**The farther backward you can look, the farther forward you are likely to see.**

-- Winston Churchill



# Floods & Flash Floods



**Flash Flooding is our Region's Biggest Threat**

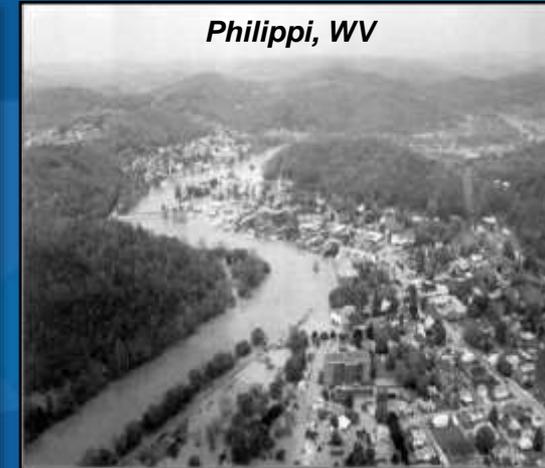
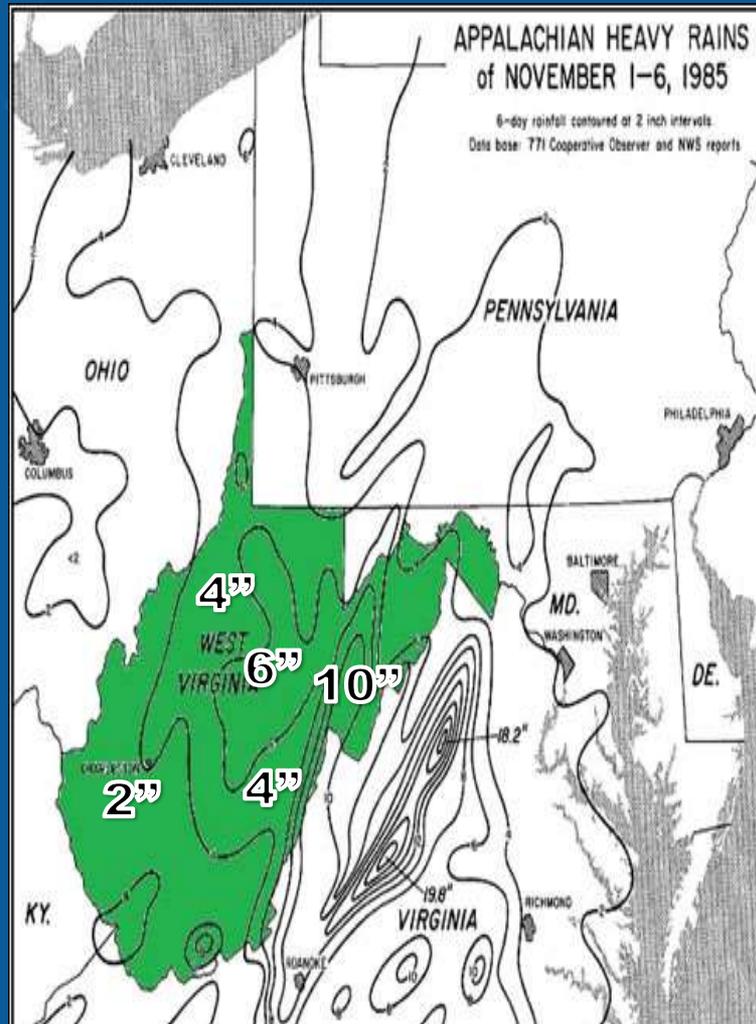
**Flooding Kills More People Than Any Other Weather Type**

**Most People Die Trying To Cross Flooded Roadways**



# Lessons from the Past

## Election Day Floods of November 1985



- 3,500 homes/180 businesses destroyed
- 123 bridges damaged or destroyed
- \$570 million in damages
- 47 people killed

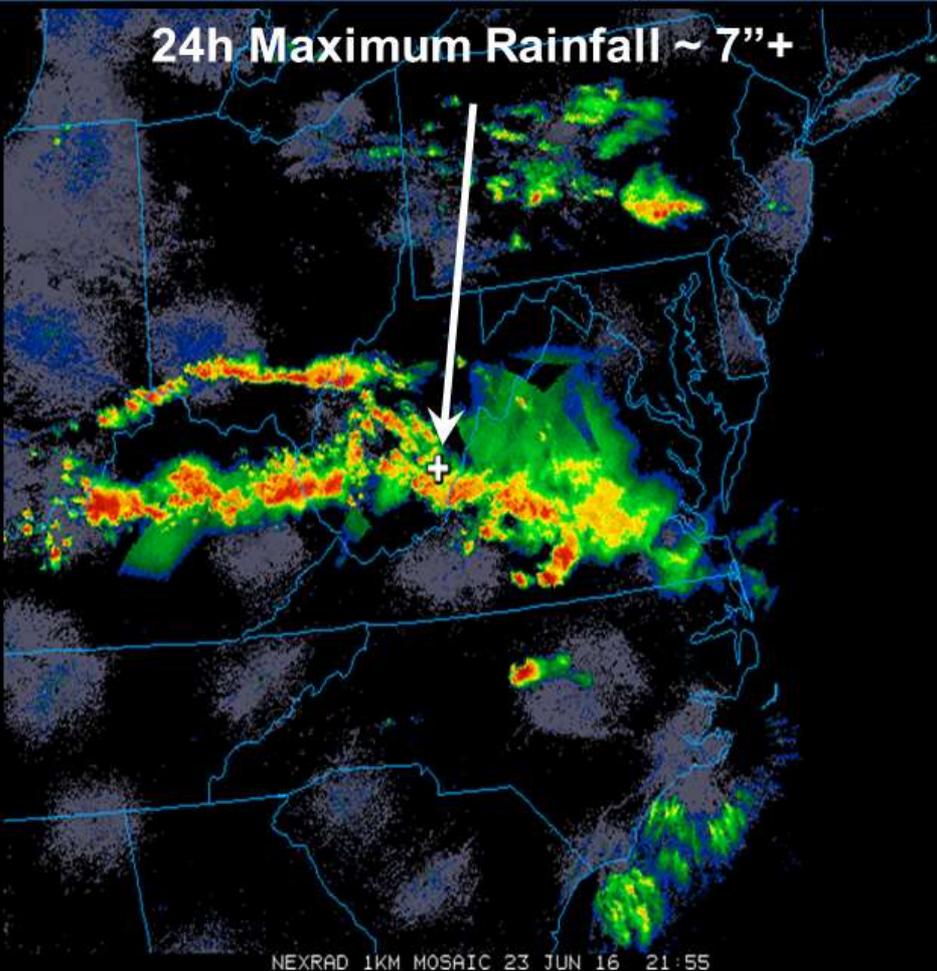


# Flash Flood History

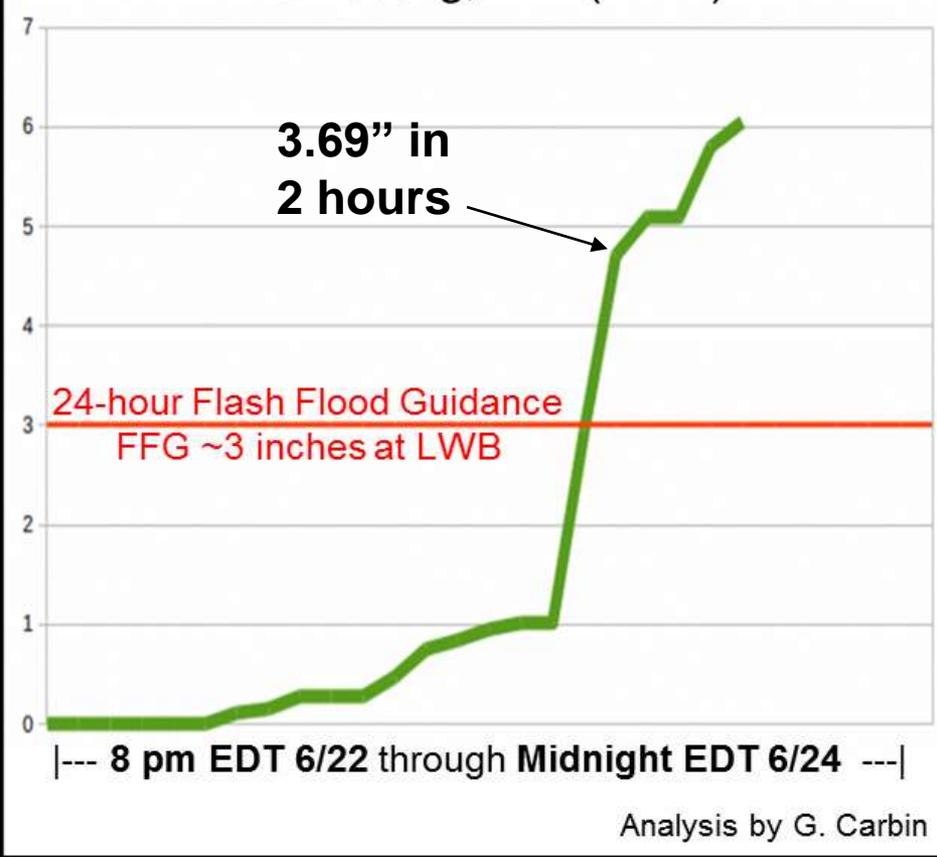
## Floods of June 2016

### Hourly Radar and Summed Rainfall, Lewisburg, WV (ASOS)

24h Maximum Rainfall ~ 7"+



Accumulating Rainfall (inches) at Lewisburg, WV (LWB)





# Flash Flood History

## White Sulphur Springs area



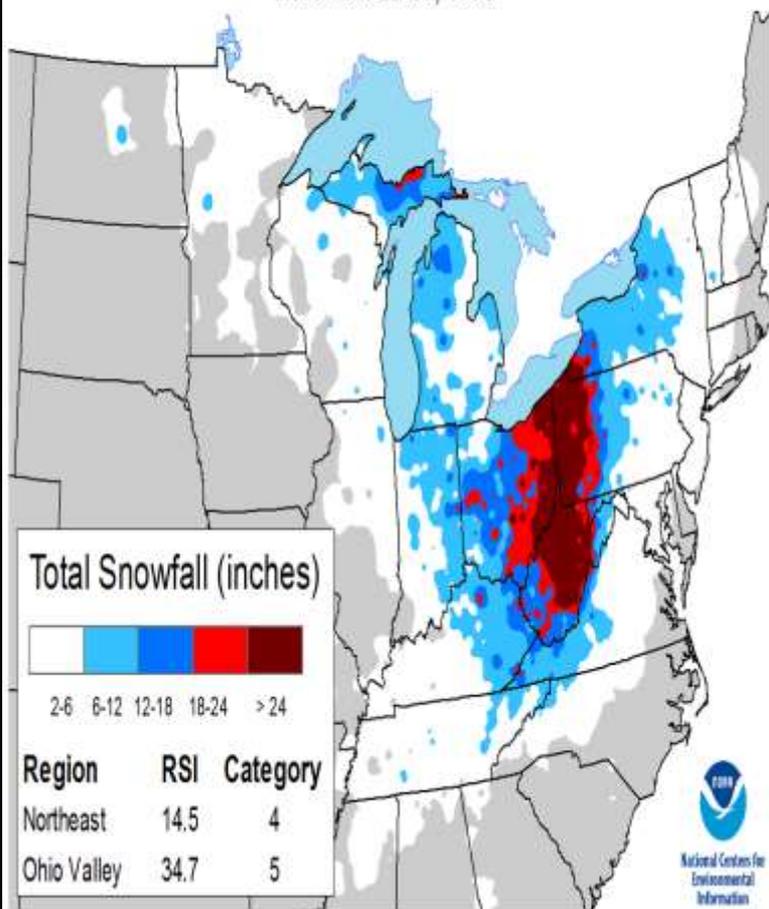


# Lessons from the Past

## Great Appalachian Storm of November 1950

### Regional Snowfall Index

November 22-30, 1950



- Coburn Creek – 62”
- Pickens – 57”
- Clarksburg – 38”
- Parkersburg – 34.6”
- Morgantown – 31.3”
- Charleston – 25.7”
- Winds over 30 mph with temperatures in the single digits

**160 Deaths!**



# Lessons from the Past

## Wheelersburg, OH Tornado

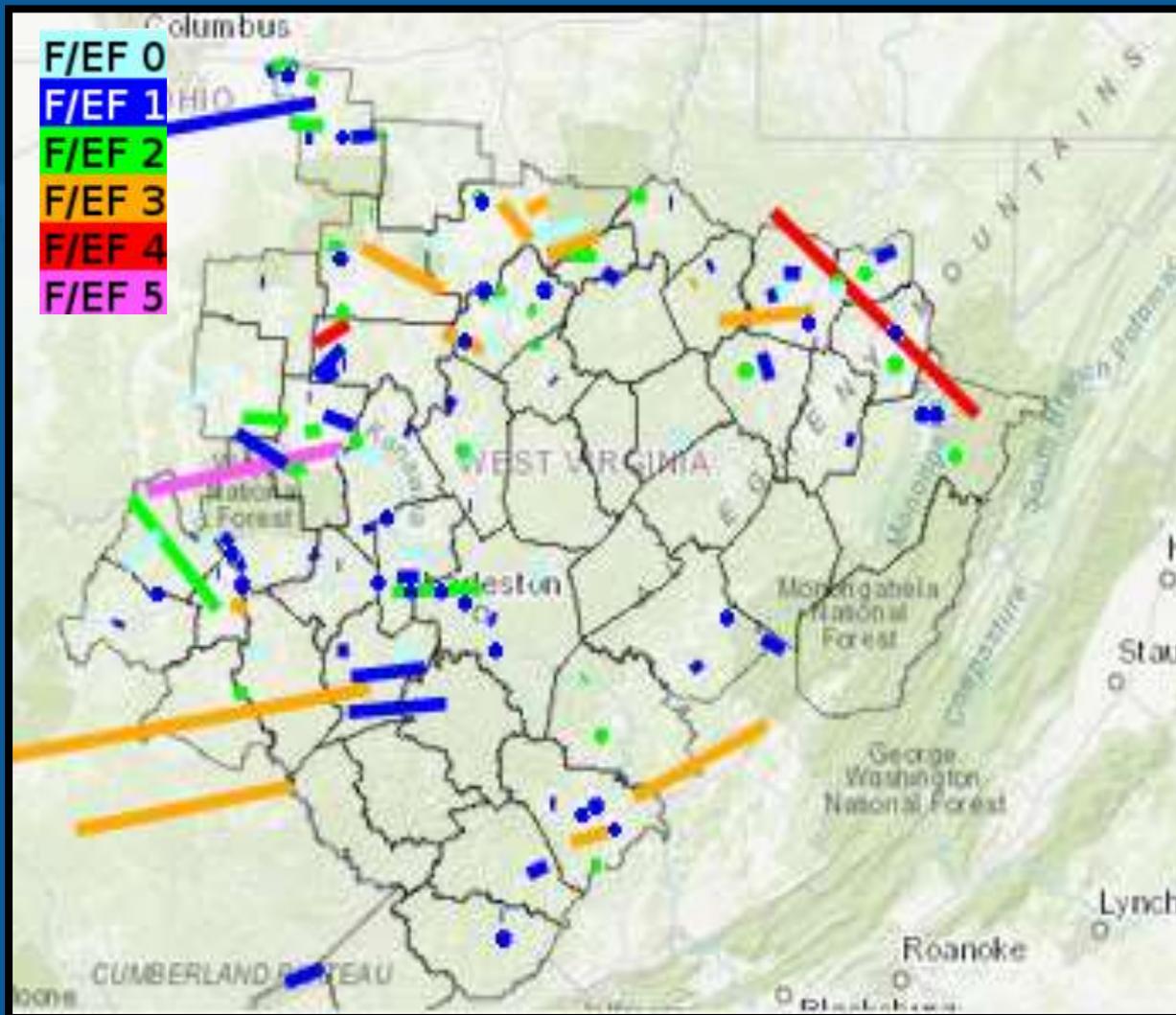
*Portsmouth, OH – Photo Courtesy  
of Portsmouth Public Library*



- F5 Tornado tracked 45 miles from Greenup, KY through Scioto, Lawrence and Gallia Counties, lifting in Gallipolis, just before crossing the Ohio River.
- Tornado was nearly a half mile wide at one point
- 7 people died in Scioto County, 108 total injuries.



# Tornado History



Total Tornadoes – 158

Most in a County – 12  
Washington, OH

Earliest – May 12, 1886  
Meigs County, OH F4

Longest – 86 miles  
March 2, 2012  
Lawrence KY, Wayne  
and Lincoln Counties

Strongest – F5  
April 23, 1968  
Greenup, Lawrence  
OH, Gallia Counties

Deadliest – Shinnston F4  
100 Dead/381 Injured  
June 23, 1944

<http://midsouthtornadoes.msstate.edu/index.php?cw=rlx>



# The EF Scale - Tornadoes Intensity

## EF0 - EF1

- 65-110 mph
- Short-lived, track < 3 miles
- Develop quickly, occasionally without warning



## EF2 - EF3

- 111-165 mph
- Track 10-15 miles
- Better detection



## EF4 - EF5

- 166-200+ mph
- Track 20-50 miles, can last up to an hour
- Develop from well organized supercell storms



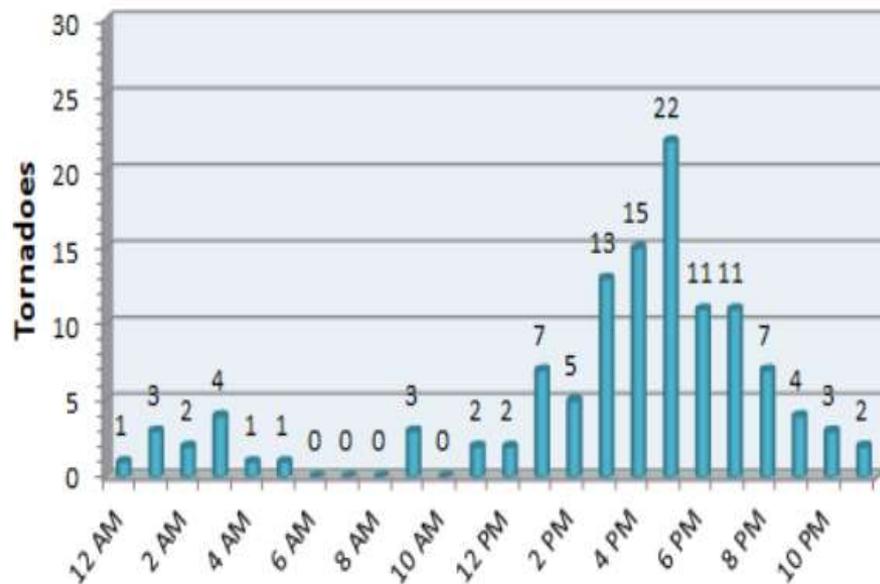


# Tornado History

### Total Number of Tornadoes By Month



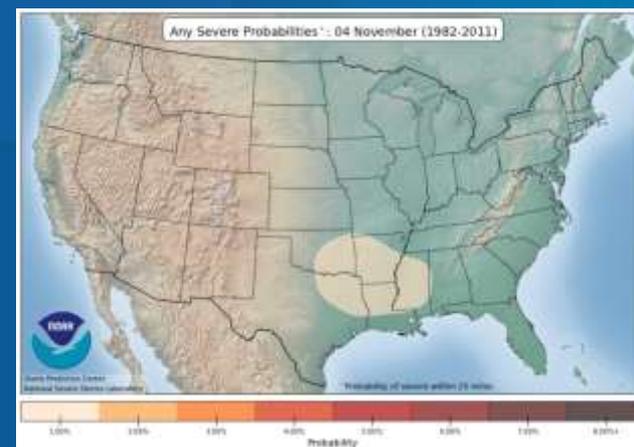
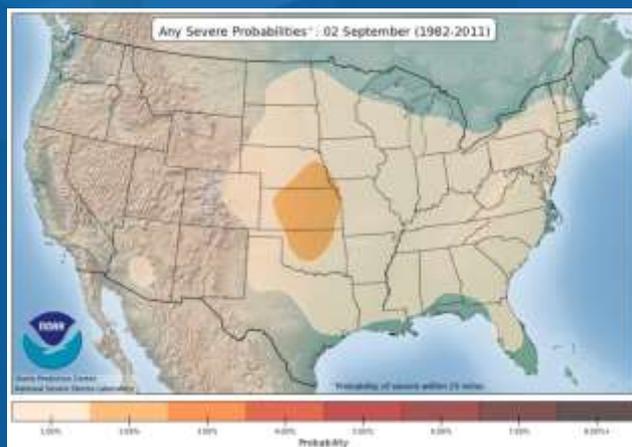
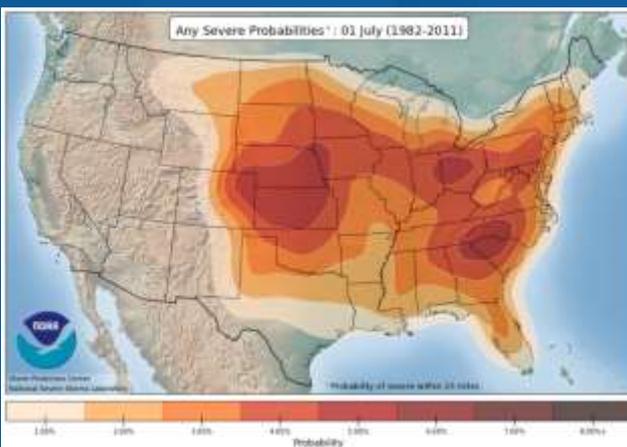
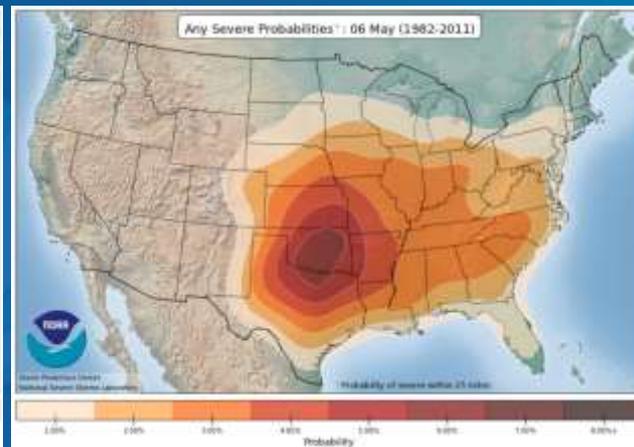
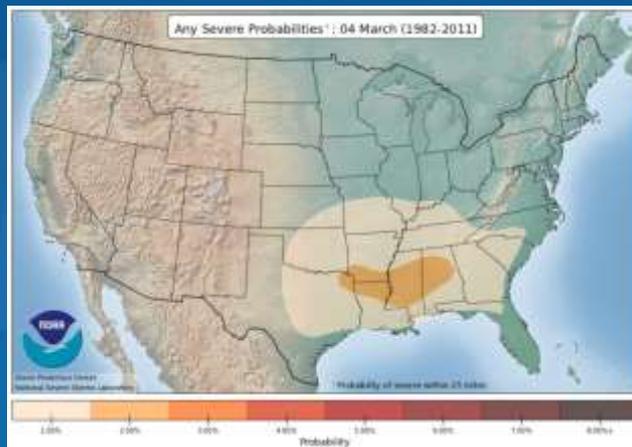
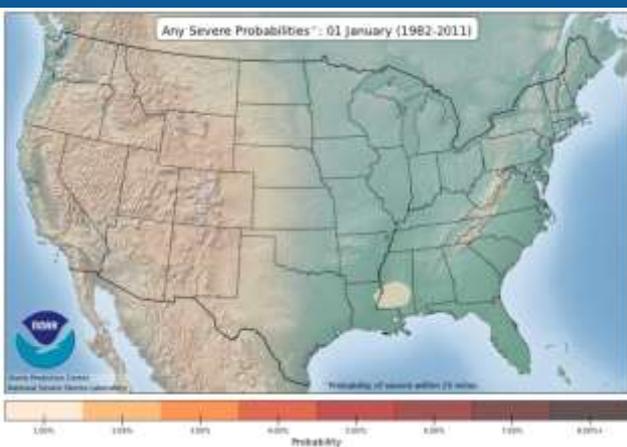
### Total Number of Tornadoes By Time





# Severe Weather Climatology

## Severe Thunderstorm Climatology throughout the Year





# Spotter Training Outline

## Section 1: Lessons from the Past

- Tornado history and climatology

## Section 2: The Role of the Weather Spotter

- National Weather Service – Who We Are and What We Do
- Why We Need Spotters?
- How and What to Report

## Section 3: Thunderstorms

- Ingredients...Anatomy...and Varieties
- Severe Thunderstorm Spotting Concepts
- Cloud Identification

## Section 4: Staying Safe in Severe Weather

- Outlooks, Watches and Warnings – Oh my!
- Severe Weather Risk Awareness Resources and Apps
- Safety Basics

## Section 5: Winter Weather Spotting

## Section 6: Review & Quiz



# The National Weather Service



## Our Vision

A Weather-Ready Nation: Society is Prepared for and Responds to Weather-Dependent Events

## Our Mission

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy.



# The National Weather Service



- Includes 4 states, 49 counties
  - 34 WV
  - 9 OH
  - 4 KY
  - 2 VA
- Just under 22,000 sq mi.
- Highest elevation: 4,848 ft – Snowshoe, WV
- Lowest elevation: 495 ft – Greenup Co, KY



# Spotter Guidelines

**Important: We Train Spotters, Not Chasers!**



**Terrain and Vegetation Seriously Limit Visibility in our Region Making Storm Chasing Very Dangerous Here.**

**Spotting = Telling Us What is Happening Where You Are**



# Spotter Guidelines

## Safety is #1 Priority

**Protect You and Your Family First**

**Know When to Contact the NWS**

**Stay Calm and Be Specific – Do Not Exaggerate  
Reports**

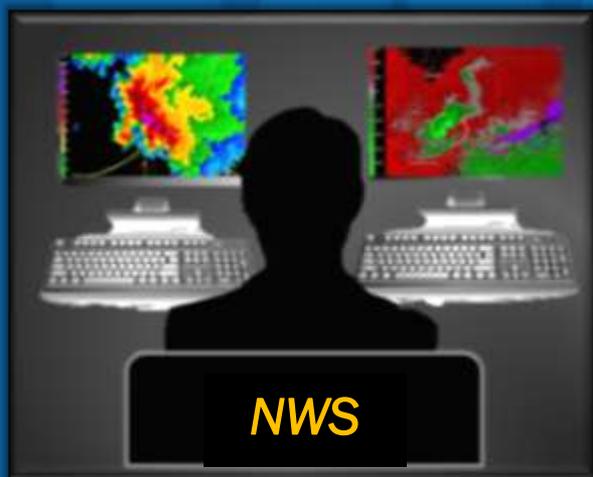
**Never Give Out the Spotter Phone Number**



# The Role of the Weather Spotter

**Your  
Accurate  
Reports**

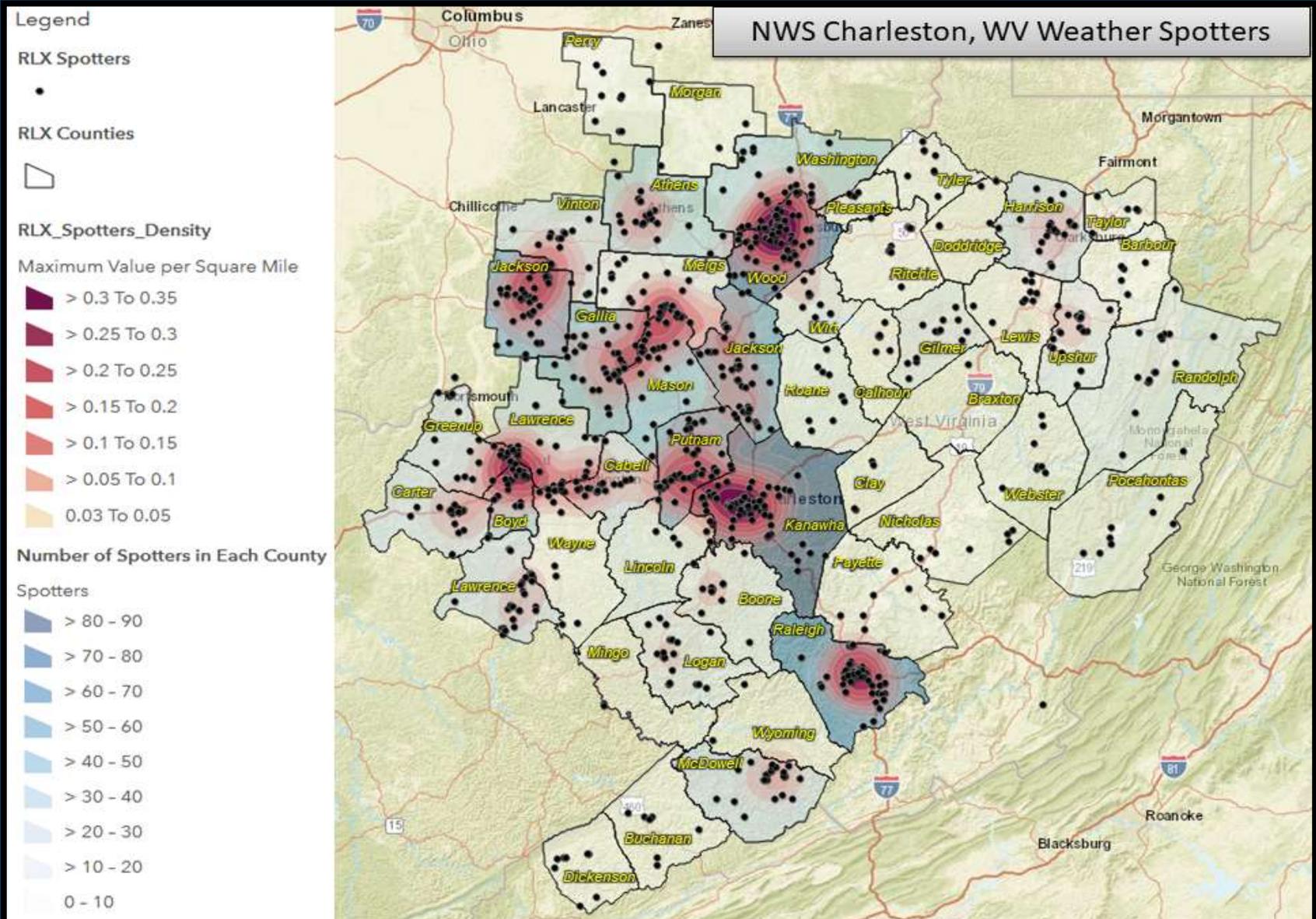
- Verify What NWS Sees on Radar
- Add Credibility to NWS Warnings



**Credible  
WARNING!**



# The Role of the Weather Spotter





# The Role of the Weather Spotter

## If you want to be a registered spotter for NWS Charleston, WV

1. Complete online form which will be emailed out about an hour after this webinar completes. We will add you to our spotter database using the information provided.
2. After completing the online form, you will receive a separate email containing our Weather Spotter Hotline number. (This may take a couple of days, so be patient.)

## What if you don't live in the NWS Charleston area of responsibility?

Contact your local NWS office and tell them you took our training.

<https://www.weather.gov/stormready/contact>

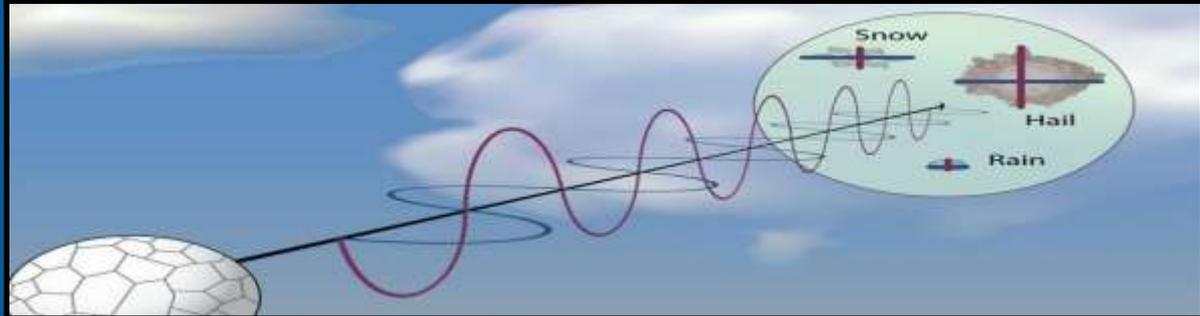
## What if you don't want to register to be a spotter?

Sit back and enjoy the webinar. No action is needed.



# Why Do We Need Spotters

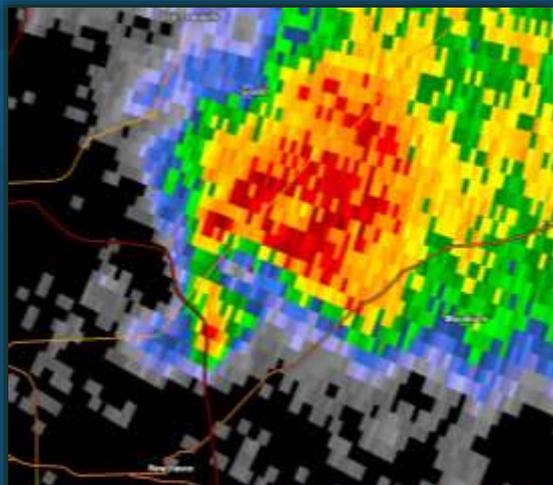
## Radar Beams Travel Up and Away





# Why Do We Need Spotters

## What the Radar Gives Us Back



### Reflectivity (dBZ)



Small Particles

Light Rain, Dust, Bugs

Big Particles

Hail, Big Rain Drops

### Velocity (kts)



Speed Moving Away from Radar



Speed Moving Toward Radar



# Why Do We Need Spotters

## Spotters Are Integral Part of the NWS Warning Process



(c) Jim Reed Photography

- The public is more likely to heed an NWS warning when an actual report has been confirmed
- Impact based warnings contain tags at the bottom to better communicate the threat

&&

```
LAT...LON 4082 8436 4082 8440 4077 8440 4073 8467
4073 8480 4086 8480 4099 8467 4099 8441
4095 8440 4090 8440 4090 8438
TIME...MOT...LOC 2223Z 235DEG 22KT 4081 8475
```

```
TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL...0.00IN
```

\$\$

**NWS Warnings + Ground Truth = Public Action**



# How to Report...

There are many ways to contact us.  
What method you use depends on your specific situation.



## Spotter Hotline (provided later)

Who you are

What weather is occurring or has occurred

When did this weather happen

Where the weather took place

Your Reports Are Critical to Providing Life Saving Warnings

Real Time Reports are Crucial though Reports Received  
In the Days Following are Extremely Helpful





# How to Report...

## NWS Charleston on Facebook & Twitter

Post your report here.  
Pictures to document the  
damage are great!



**@NWSCharlestonWV**

**Terry Holt**

Pickup was totaled and a van damaged on US Hwy 70 west of Eubank, KY in Lincoln Co. about 5PM 9/11/13...many trees down in the area...no injuries



Unlike · Comment · Share · September 12, 2013 at 1:37pm

<https://www.weather.gov/socialmedia>



# How to Report...

## The Ping Project

Your reports will help the weather research community and are compared against radar data.

There's an app for that! Search “**mping**”.



<http://www.nssl.noaa.gov/projects/ping>



# What to Report...



**Tornadoes**  
**Funnel Clouds**  
**Wall Clouds**  
**Hail**  
**Storm Damage**  
**Flooding**  
**Heavy Rainfall**  
**Wind Damage**  
**Winter Weather**





# What to Report...

## Reporting Hail

...how big is a marble?



WARNING NEEDED!





# What to Report...

## Reporting Hail



**Always Report Largest Hailstone You See**



# What to Report...

## Reporting Wind

Note Damage Type and Estimate Speed if no Wind Measurement is Available

Speed (mph)	Description
25 – 31	Large branches in motion
32 – 38	Whole trees in motion Inconvenience felt walking in the wind
39 – 54	Some branches break off trees Wind impedes walking progress
<u>55 - 72</u>	Damage to chimneys or TV antennas Shallow rooted trees pushed over
73 - 112	Broken windows, peeled off roofing Mobile homes overturned, cars pushed off roads
113 -157	Roofs torn off, car lifted off of the ground

**58 MPH Wind = Severe Thunderstorm**



# How to Report...

There are a variety of ways to report weather to the NWS office in Charleston, WV. You can use any/all of these to reach us. Below the contact info are the types of information we'd like you to report. Please be sure to include the location of the weather event, e.g. 5 miles northwest of Columbus. You may also indicate if you are a trained spotter, a ham radio operator, a member of law enforcement, or other affiliation if applicable.

Your severe weather reports reach forecasters in real time and, after quality control, may be included in [Local Storm Reports](#). Most storm reports are also catalogued in the official [NOAA Storm Data](#) publication.



## Spotter Hotline

[Trained weather spotters](#) can report significant weather conditions by calling the toll-free spotter hotline given to them as part of their training.



## Facebook

Post information on our Facebook page: <https://www.facebook.com/NWSCharlestonWV>



## Twitter

Send us a tweet: [@NWSCharlestonWV](#)



## Email

Send us an email: [rlx.ops@noaa.gov](mailto:rlx.ops@noaa.gov)



## Mobile App

Send reports from your location via a smartphone app: [MPing](#)

Tornado

**Damaging Winds**

Hail

Flooding

Heavy Rain

Snow

Freezing Rain/Icing

Strong Winds

Fog

## Wind Damage

What kind of damage did the wind cause?

- Small limbs down (less than 2" in diameter)
- Large limbs/branches down (more than 2" in diameter)
- Trees snapped or uprooted
- Power lines down
- Structural damage and/or Roof damage

[www.weather.gov/rlx/reports](http://www.weather.gov/rlx/reports)



# Additional Ways to Help...

## Help Observe Precipitation in Your Community by Joining the **Community Collaborative Rain, Hail & Snow Network**



Volunteers take their readings once a day

Observers can easily transmit their observations using mobile devices



<http://www.cocorahs.org>



# Additional Ways to Help...

## HOW CAN I JOIN THE NETWORK?



## Five easy steps

*Simply sign-up on the  
CoCoRaHS web page:  
[www.cocorahs.org](http://www.cocorahs.org)*

*Obtain a 4” plastic rain gauge*

*View the on-line “training slide show”  
or attend a training session*

*Set-up the gauge in a “good”  
location in your yard*

*Start observing precipitation  
and report on-line daily*



# Spotter Training Outline

## Section 1: Lessons from the Past

- Tornado history and climatology

## Section 2: The Role of the Weather Spotter

- National Weather Service – Who We Are and What We Do
- Why We Need Spotters?
- How and What to Report

## Section 3: Thunderstorms

- Ingredients...Anatomy...and Varieties
- Severe Thunderstorm Spotting Concepts
- Cloud Identification

## Section 4: Staying Safe in Severe Weather

- Outlooks, Watches and Warnings – Oh my!
- Severe Weather Risk Awareness Resources and Apps
- Safety Basics

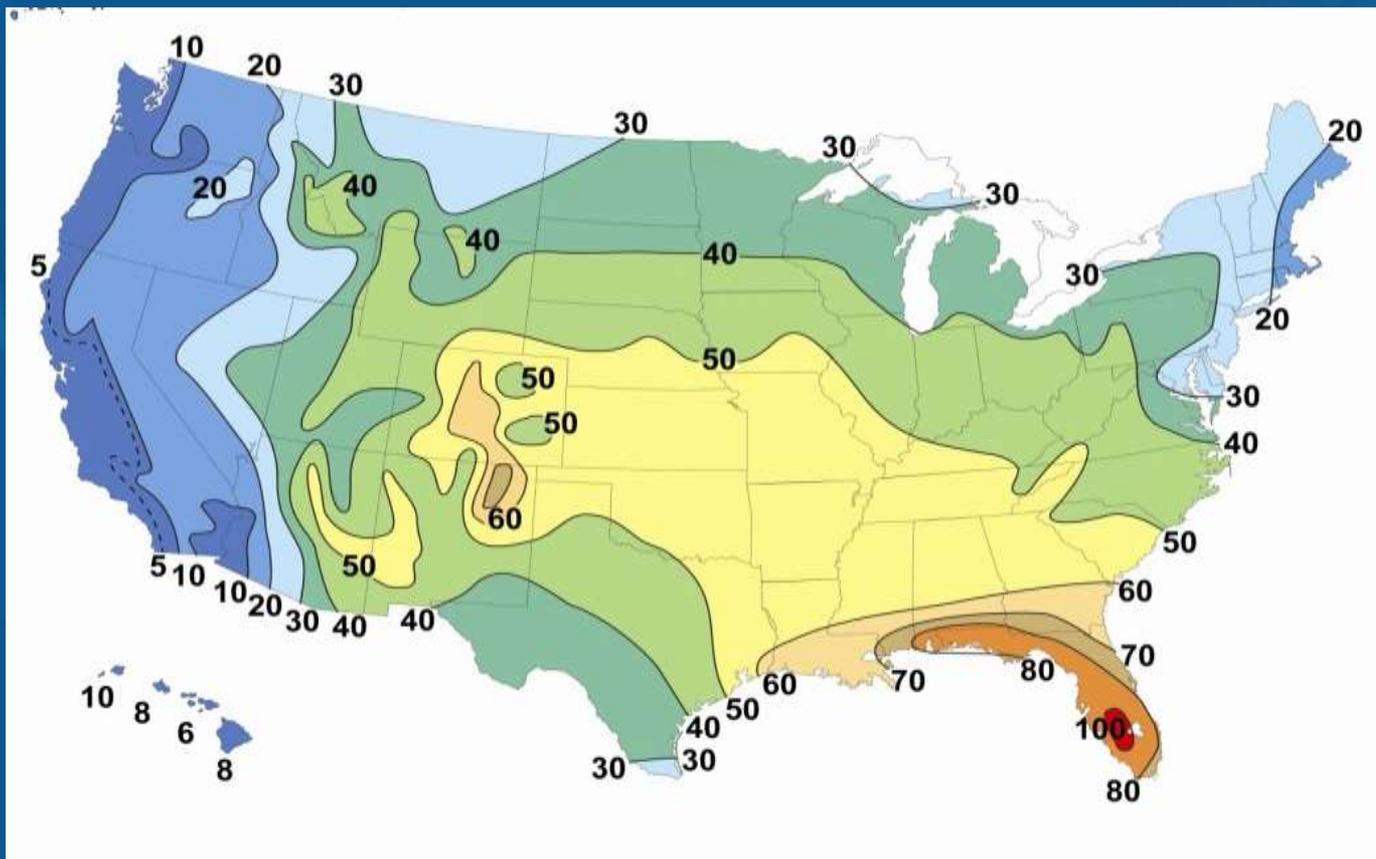
## Section 5: Winter Weather Spotting

## Section 6: Review & Quiz



# Thunderstorms...

## Average Annual Thunderstorm Days





# Thunderstorms...

## National Weather Service Definition of a Severe Thunderstorm

Hail 1 inch or greater



Wind 58 mph or more



Tornado



**Just FYI:**  
Less than 10% of  
thunderstorms are severe

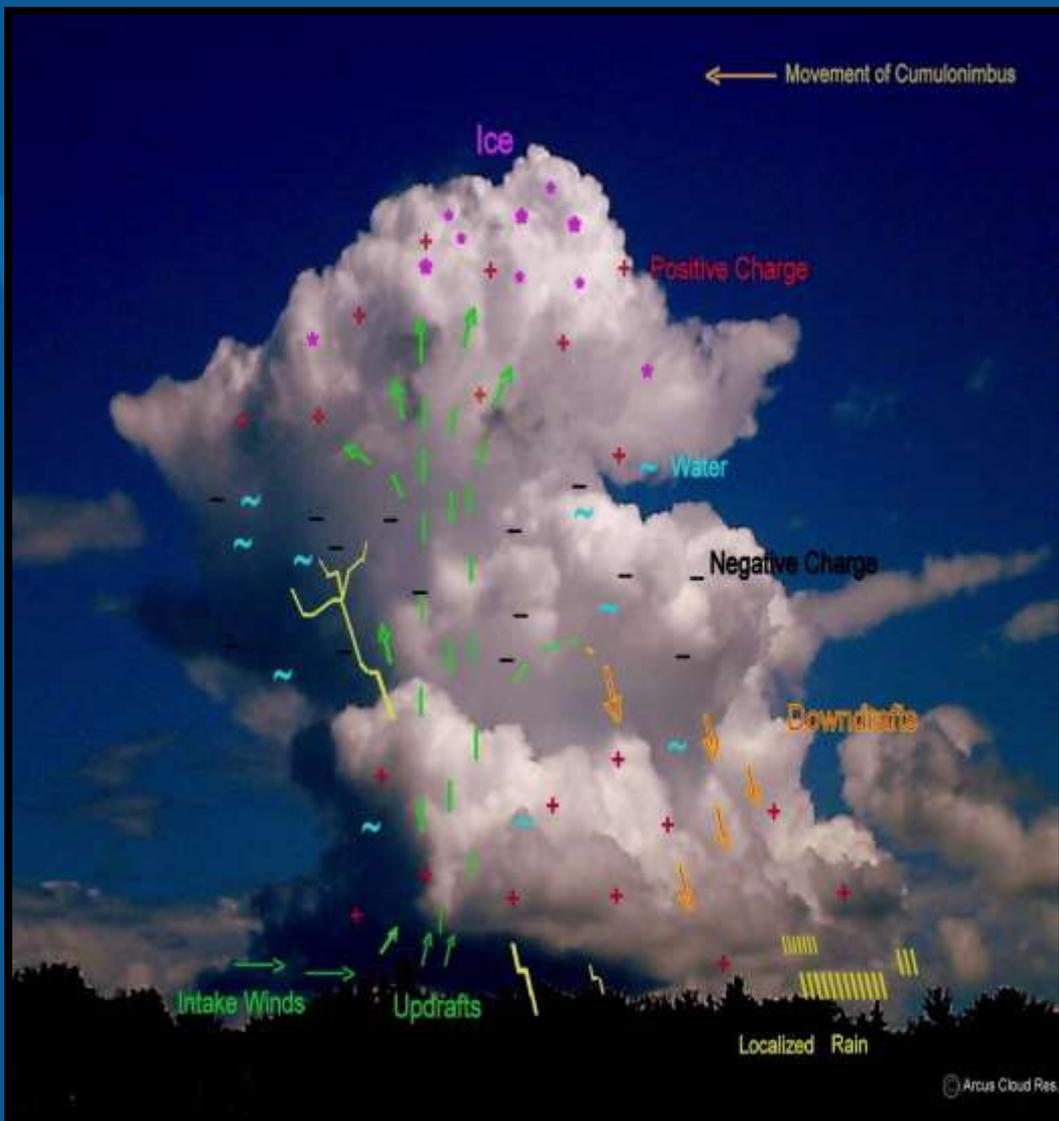
Though Lightning is Always Extremely Dangerous...

The Amount of Lightning in a Thunderstorm Does Not Determine if a Thunderstorm is Severe





# Lightning



Lightning is one heck of a spark!

- 100 million to 1 billion volts and billions of watts
- Heats the immediate surrounding air 18,000 degrees to 60,000 degrees



# Lightning Safety

Lightning often strikes outside of heavy rain; may occur as far as 10 miles away from where rain is falling.

***More than 50% of lightning deaths occur AFTER the storm has passed.***



**When Thunder Roars, Go Indoors!**



# Lightning Safety

## When Thunder Roars, Go Indoors!

Close Enough to Hear Thunder—Close Enough to Be Struck

Seek Indoor Shelter Immediately

Stay Away from Windows and Doors

Do Not Use the Telephone or Take a Bath or Shower

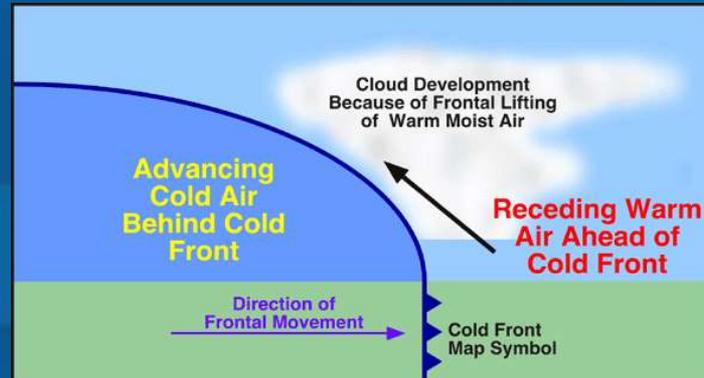
Get in a Vehicle if Caught Outside with No Other Shelter



# Thunderstorm Ingredients

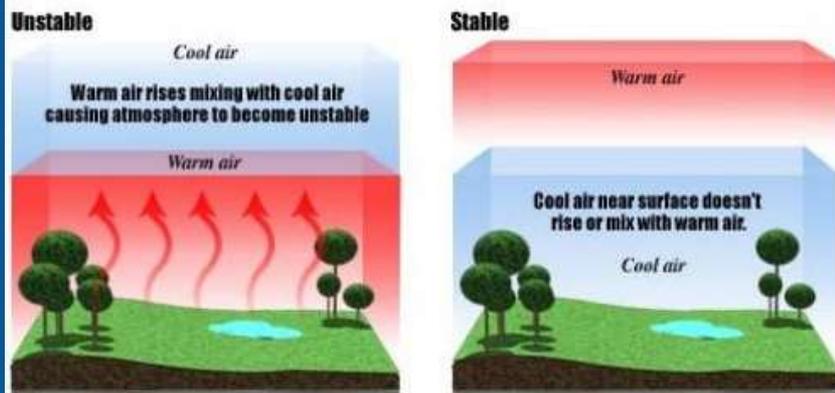


Moisture



Source of Lift

## How atmosphere becomes stable or unstable



Instability



Vertical Wind Shear



# Thunderstorm Types

Single  
Cell

Multicell  
Cluster

Multicell  
Line

Supercell

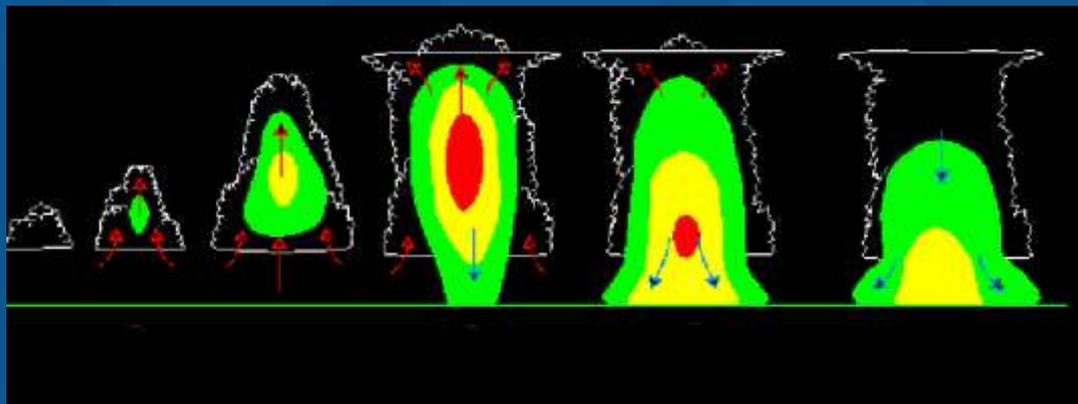


**Severe Weather Threat Increases**





# Single Cell Thunderstorms



**Mostly Non-Severe**

Life Cycle of < 30 minutes

May Contain Small Hail

& Gusty Winds



# Multicell Thunderstorms

Overall Severe Weather Threat Level:

**Low - Moderate**

Wind



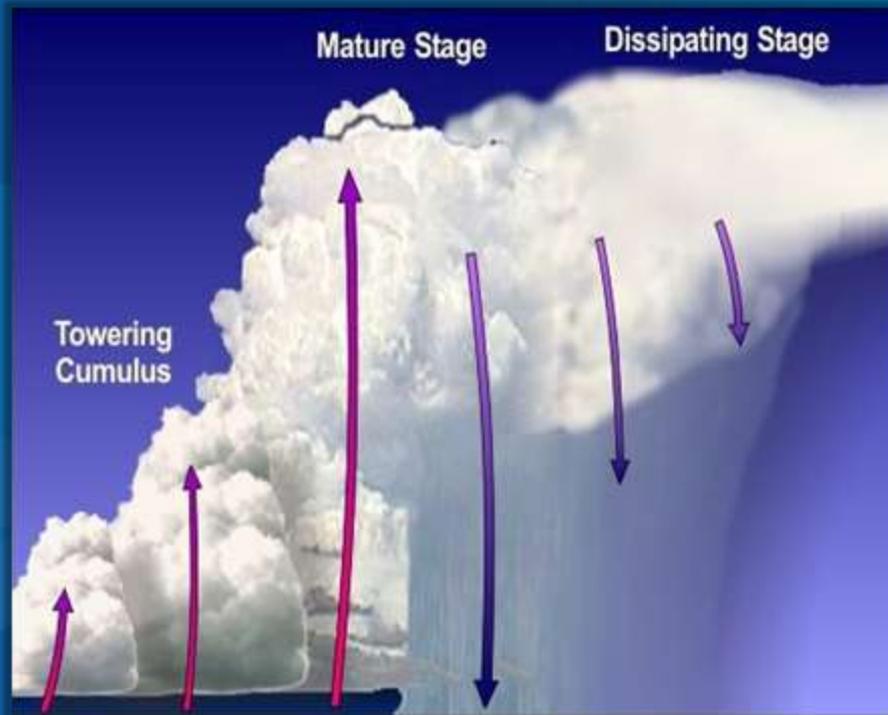
Hail



Heavy Rain



Tornado



- Flash flooding due to slow movement
- Downbursts, straight-line winds, small-med sized hail, lightning



# Downburst Winds



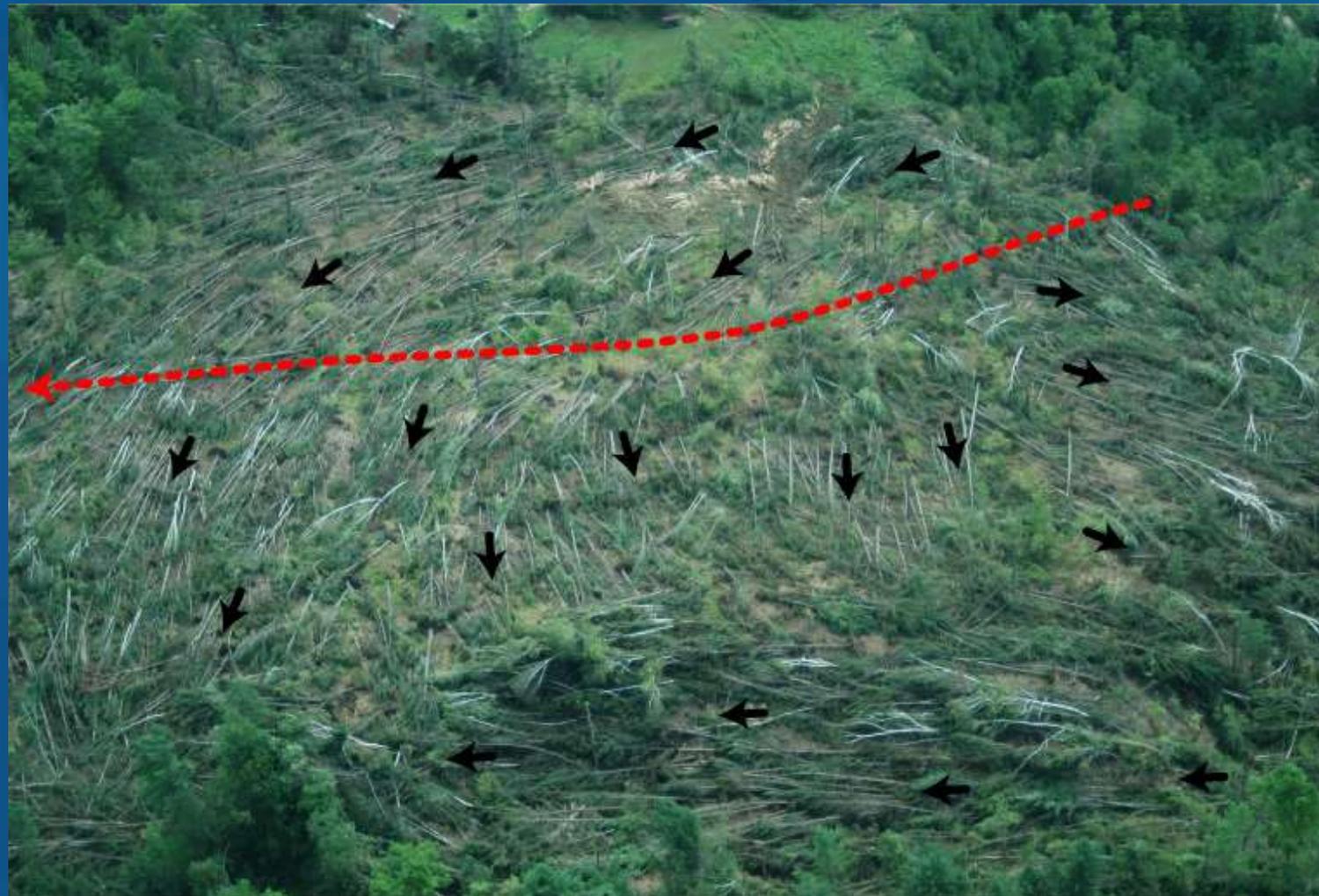
**Microburst:** affecting an area *less than 2.5 miles* across.

**Macroburst:** winds extending in excess of *2.5 miles* across.



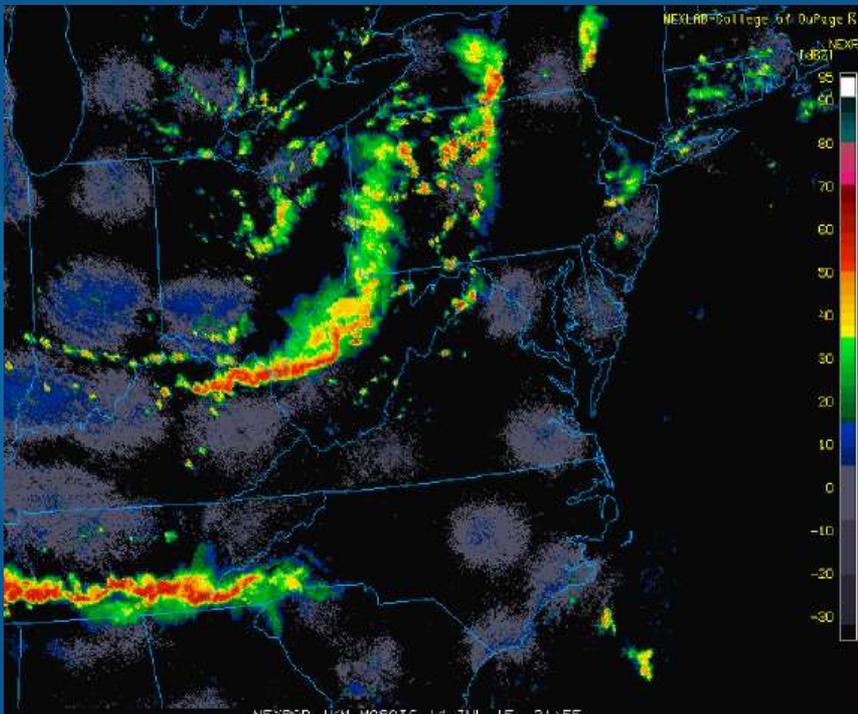
# Downburst Winds

## Damage Produced by a Tornado





# Multicell Squall Line



What You See

Overall Severe Weather Threat Level: **Moderate-High**

Hail



Wind



Heavy Rain



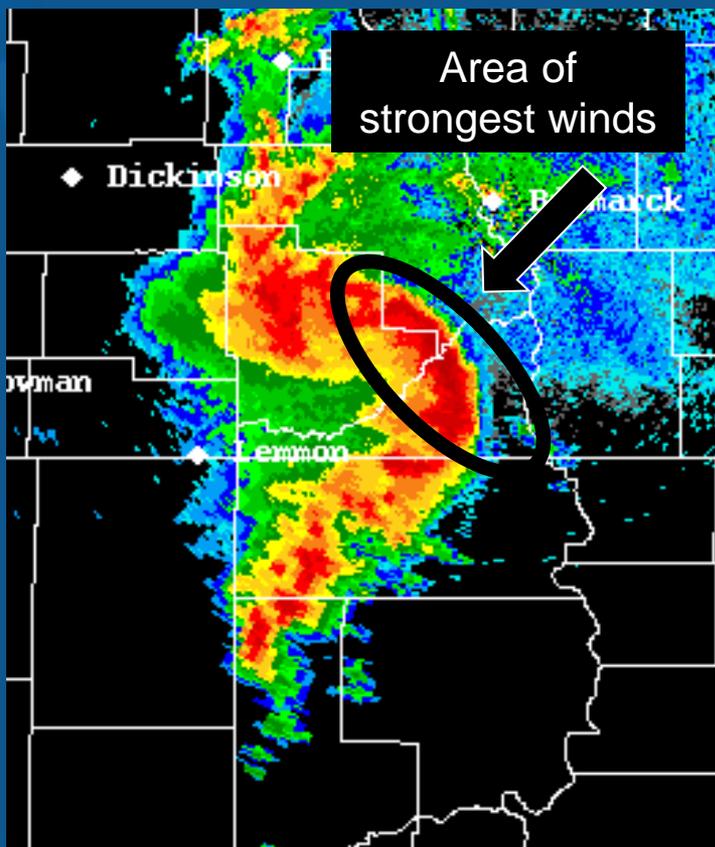
Tornado





# Squall Line Thunderstorms

## The “Bow Echo”



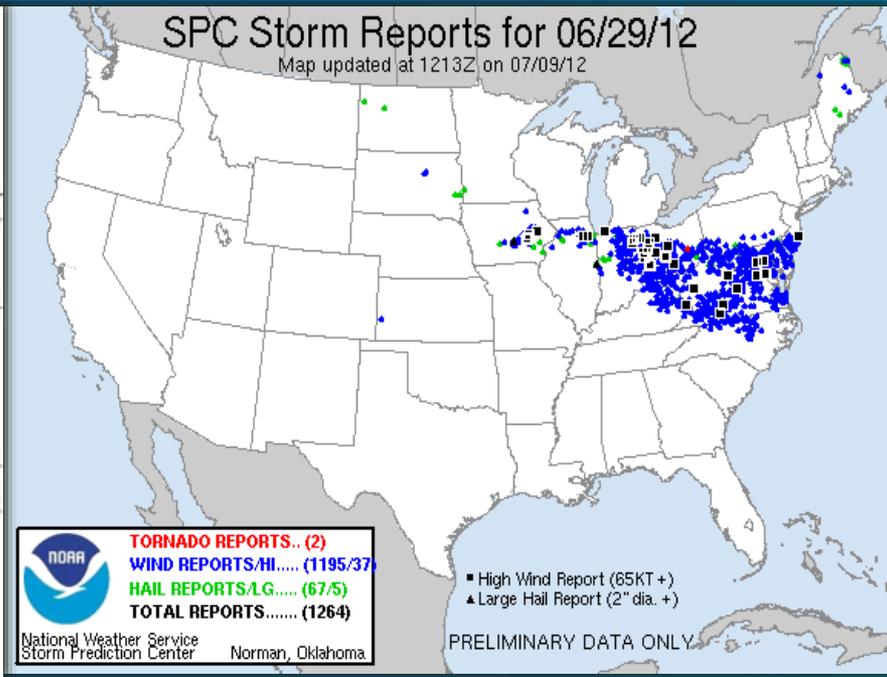
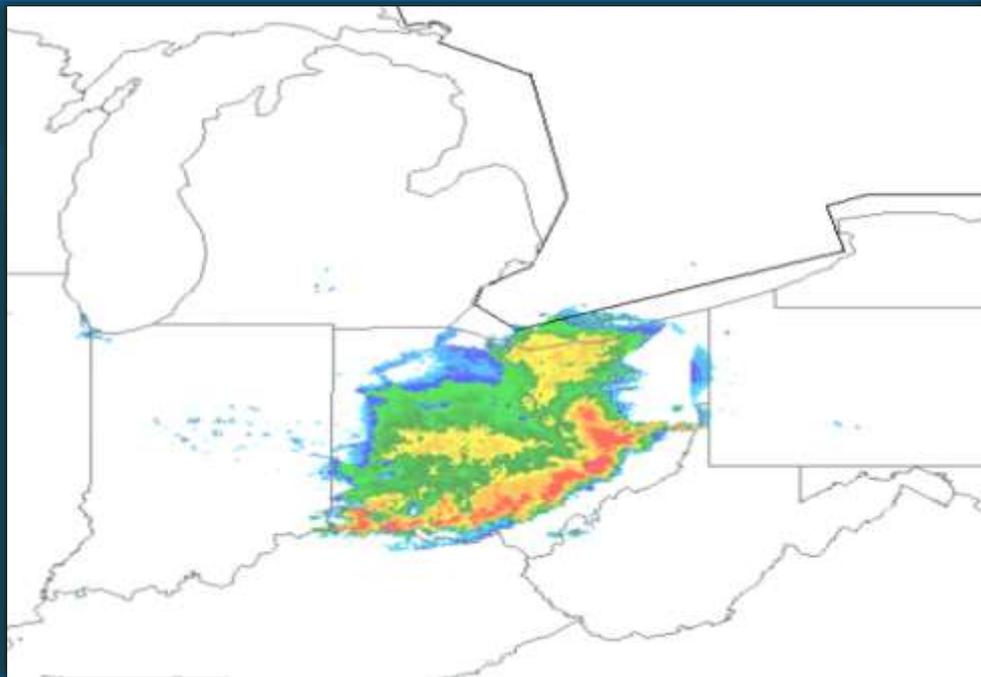
Lexington, KY – June 15, 2010  
John Bradshaw

**Bow echoes are usually associated with an axis of enhanced winds that create straight-line wind damage at the surface.**



# Squall Line Thunderstorms

## Extreme Case: Derechos



Overall Severe Weather Threat Level:

**High**

Hail



Wind



Heavy  
Rain



Tornado





# More About the Shelf Cloud

Slopes Down and Away from the Rain



Associated With the Downdraft of a Thunderstorm





# Super Cell Thunderstorms



R

Report Only What You See!  
Tell Us Your Uncertainty.

Overall Severe Weather Threat Level:

**High**

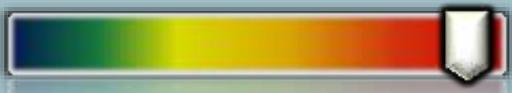
Hail



Wind



Heavy Rain



Tornado





# Wall Clouds

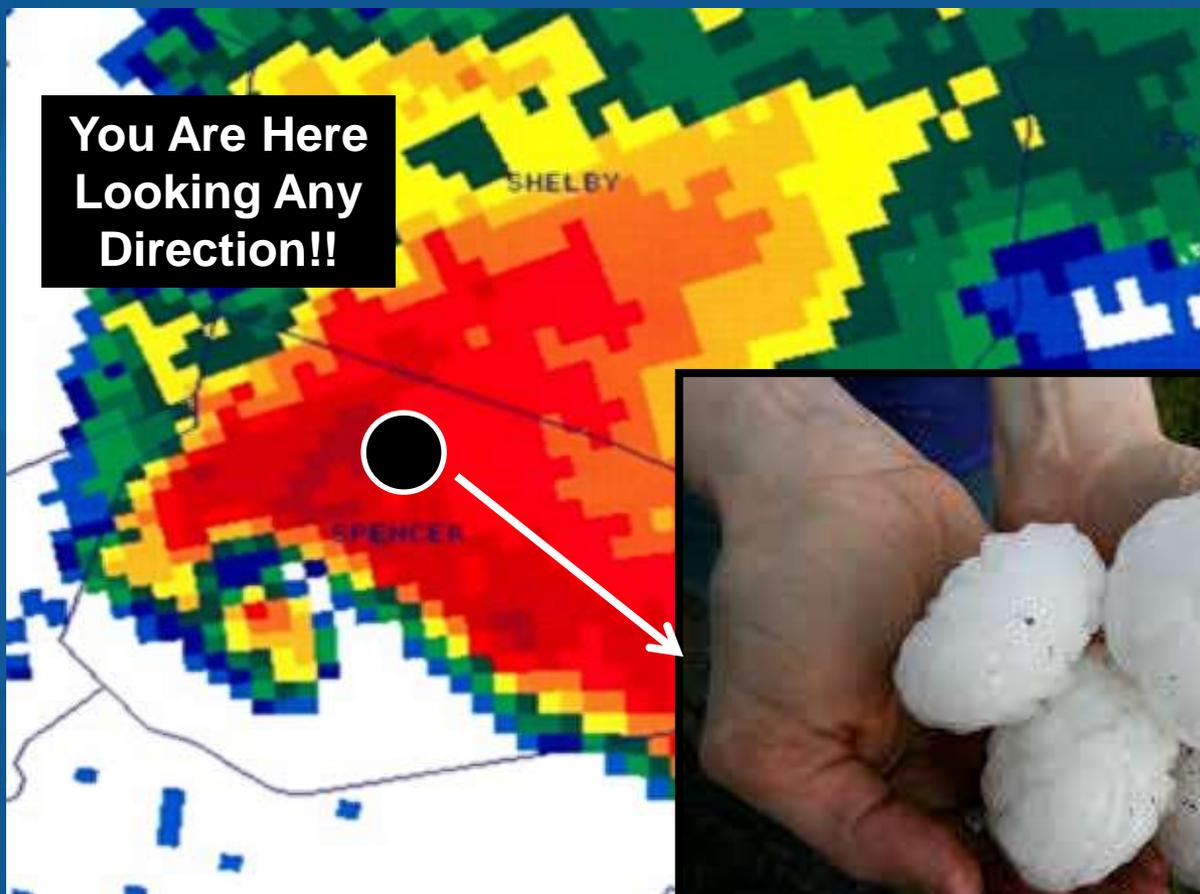


- A wall cloud is a ROTATING lowering from a T-storm updraft base, indicating a strong updraft
- Often precedes a funnel cloud or tornado



# Super Cell Thunderstorms

## Typical Radar Signature of a Super Cell



What you see on the ground depends on where your are.



# Super Cell Thunderstorms

## Typical Radar Signature of a Super Cell



What you see on the ground depends on where your are.



# Funnel Clouds

Michael Burton – Nancy, KY



Funnel Shaped Cloud Attached to the Cloud Base

May or May Not Appear from a Wall Cloud

**Rotation is Visible**

Has Not Touched Down

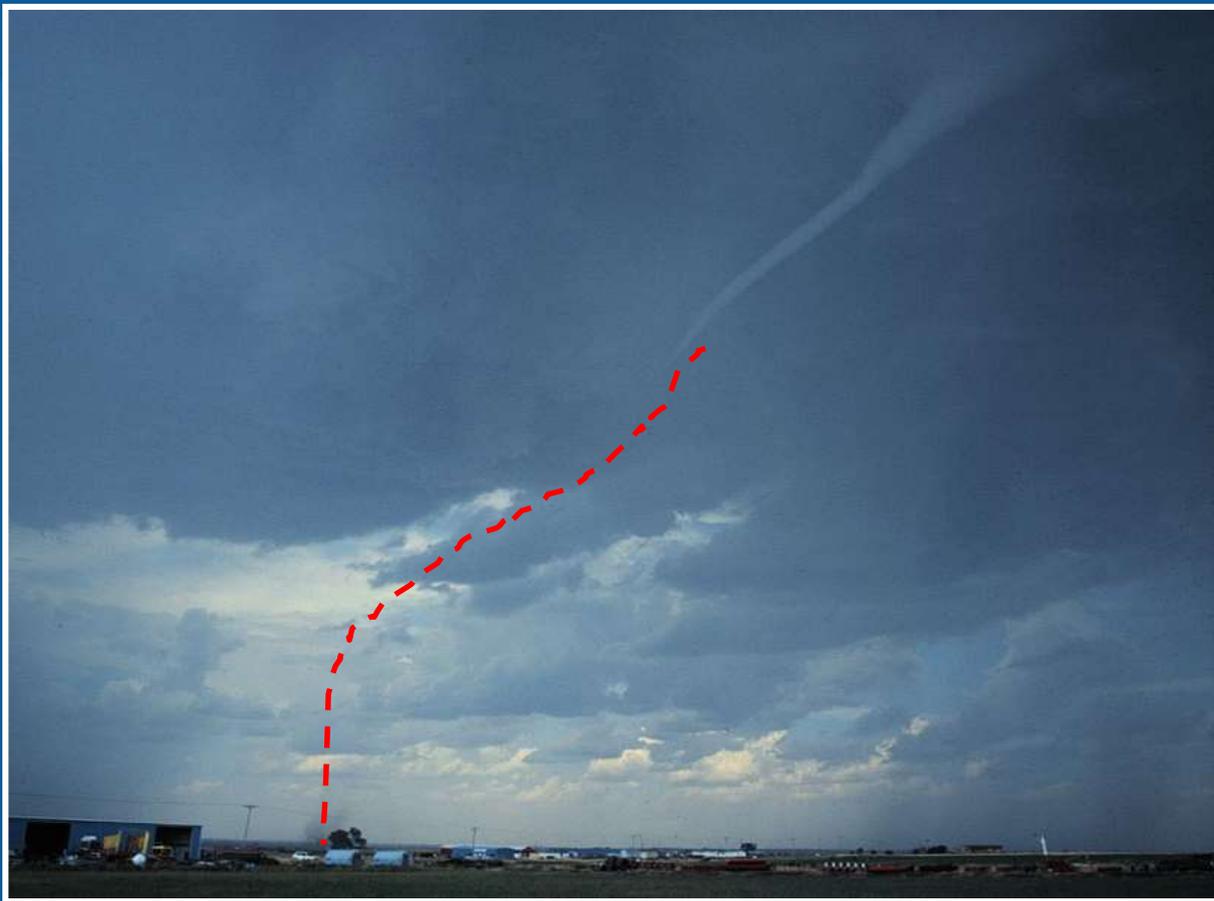


Copyright Steve Miller



# Funnel Clouds

## Think You See a Funnel Cloud?



Ask yourself two questions:

1. Is it rotating?

If the answer is yes:

2. Where's it pointing?



# Scud Clouds or “SLCs”

**BEWARE!**

**Hint!**

**SCUD clouds look ragged, versus smooth like a rapidly rotating cloud**



- Harmless, ragged looking clouds
- Do NOT rotate
- Can move up and down, may look turbulent



# Spotter Training Outline

## Section 1: Lessons from the Past

- Tornado history and climatology

## Section 2: The Role of the Weather Spotter

- National Weather Service – Who We Are and What We Do
- Why We Need Spotters?
- How and What to Report

## Section 3: Thunderstorms

- Ingredients...Anatomy...and Varieties
- Severe Thunderstorm Spotting Concepts
- Cloud Identification

## Section 4: Staying Safe in Severe Weather

- Outlooks, Watches and Warnings – Oh my!
- Severe Weather Risk Awareness Resources and Apps
- Safety Basics

## Section 5: Winter Weather Spotting

## Section 6: Review & Quiz



# Staying Safe in Severe Weather

## Prepare & Be Aware

Know and Understand the Weather Forecast

Prepare Disaster Kits for All-Seasons

**Identify Shelter Locations Before the Storm!!!**

**When a Watch is Issued, Plan Your Day Around the Weather**

**When a Warning is Issued, Take Appropriate Action!!!**





# Severe Weather Risk Awareness

## Our Office Homepage [www.weather.gov/charlestonwv](http://www.weather.gov/charlestonwv)

The screenshot shows the NWS website for Charleston, WV. At the top, there is a navigation menu with links for HOME, FORECAST, PAST WEATHER, SAFETY, INFORMATION, EDUCATION, NEWS, SEARCH, and ABOUT. Below the menu is a local forecast section for Charleston, WV, with a 'Go' button and a 'Local Forecast Help' link. A news headline is displayed: 'More Rain on the Way with Increased Flood Risk over the Coalfields and Southern Mountains'. Below this is a 'Customize Your Weather.gov' section with a search bar for a city and a 'Get Weather' button. The main content area features a map of the region with a legend for watches, warnings, and advisories. Below the map are three featured content sections: 'CURRENT WEATHER', 'WINTER WEATHER FORECASTS', and 'WEATHER HAZARD OUTLOOKS'. At the bottom, there is a grid of 18 quick links for various weather-related topics such as Radar, Current Weather, Rivers & Lakes, Air Quality, Forecast Maps, and more.

Links to national content

News Headlines  
Information you need to know

Links to local content

Watch/Warning/Advisory Map  
Click in the map for local info

Featured content and links to seasonally important content

Additional quick links to frequently used content

Type in your location to go to a detailed local forecast page

Add your city to display your current conditions and forecast

Local radar link



# Severe Weather Risk Awareness

## Local Forecast Page

[www.weather.gov/{your zip code}](http://www.weather.gov/{your zip code})

**Bookmark this page and use it like an App!**

**NATIONAL WEATHER SERVICE**

Local forecast for Charleston, SC (zip code 29401)

**Hazardous Weather Conditions**

More Rain on the Way with Increased Flood Risk over the Southeastern Mountains.

Periods of moderate to heavy rain are expected Thursday night through Saturday morning. This rain may cause flooding along creeks, streams and in low lying, poor drainage areas. Deep water may cause some trees to fall due to saturated ground.

Current conditions at Charleston, Yeager Airport (KCRW)

Light Snow Fog/Mist  
31°F  
-1°C

Extended Forecast for Charleston WV

Day	High	Low	Chance of Precip
Today	32°F	22°F	20%
Friday	32°F	22°F	20%
Saturday	32°F	22°F	20%
Sunday	32°F	22°F	20%
Monday	32°F	22°F	20%
Tuesday	32°F	22°F	20%
Wednesday	32°F	22°F	20%

Detailed Forecast

Today: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Friday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Saturday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Sunday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Monday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Tuesday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.

Wednesday: A chance of rain and snow showers between 11 am and noon. Then a chance of rain showers after noon. Mostly cloudy, with a high near 32. Chance of precipitation is 20%.



@NWSCharlestonWV





# 3-Tiered Alert System for Severe Weather

## Outlook

Up to a Week Ahead

**Be Aware!**

## Watch

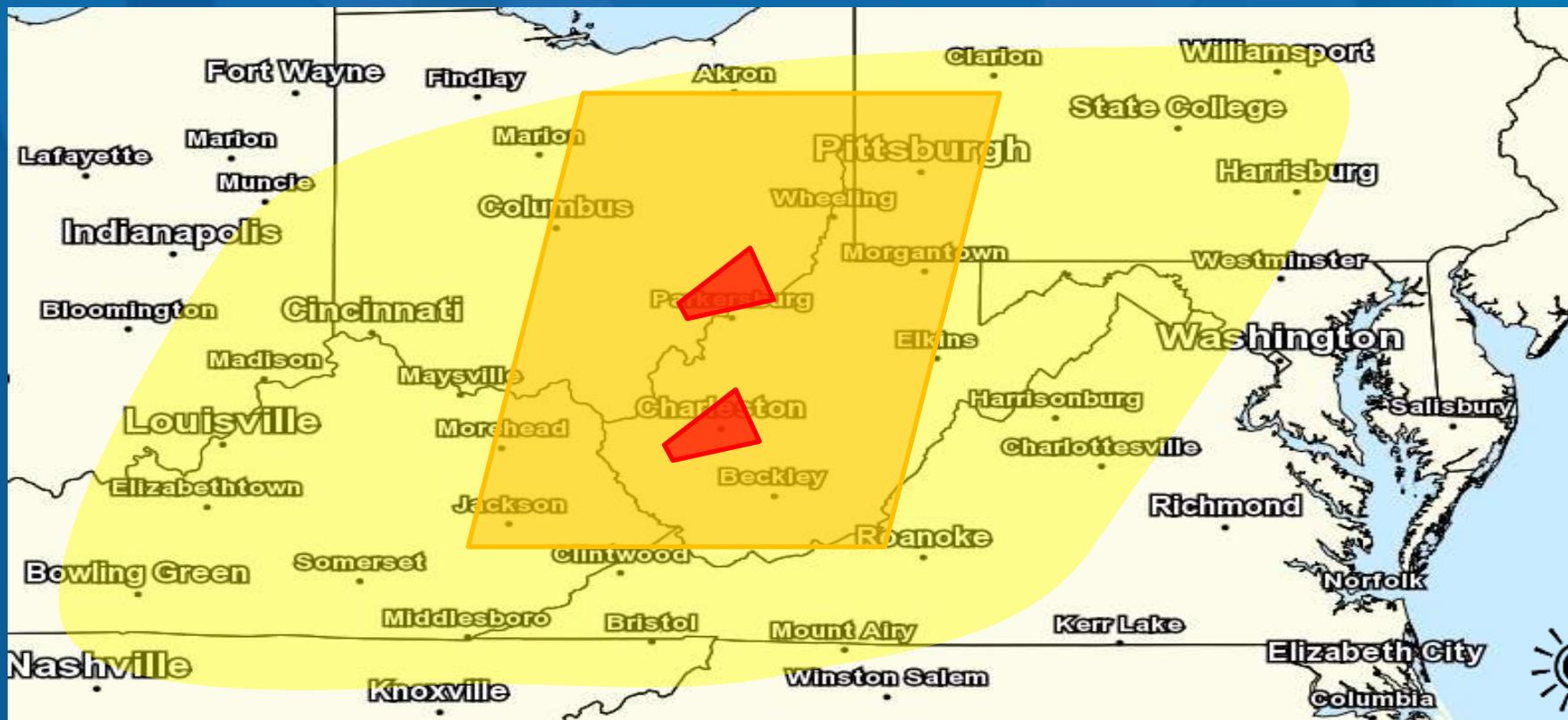
Threat Increased but Still  
Several Hours Ahead

**Get Prepared!**

## Warning

Severe Weather Imminent

**Take Action!**





# Severe Weather Risk Awareness

## Where to Get Outlooks?

**NATIONAL WEATHER SERVICE**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by ZIP, M, or ZIP code

More Rain on the Way with Increased Flood Risk over the Coalfields and Southern Mountains

Periods of moderate to heavy rain are expected Thursday night and Friday. Rainfall amounts of 1 to 1.5 inches are expected over the coalfields and southern mountains, with locally higher amounts possible. This rain may cause flooding along creeks, streams and in low lying, poor drainage areas. A period of gusty winds today and tonight could cause weak rooted trees to fall due to saturated ground. [Read More >](#)

**NWS Forecast Office Charleston, WV**  
Charleston, WV

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Click a location below for detailed forecast.

Watches, Warnings & Advisories

- Flood Flood Watch
- Wind Advisory
- Flood Watch
- Hazardous Weather Outlook

Level Map Update: Thu, Dec 27, 2018 at 10:28:26 am EST

**CURRENT WEATHER** **WINTER WEATHER FORECASTS** **WEATHER HAZARD OUTLOOKS**

Radar Current Weather Rivers & Lakes Alerts External Maps Hour by Hour Forecast

Winter Weather Operational Hazards Forecast & Discussion Real Rradars Climate Data

Fire Weather Drought Sun Storm NOAA Weather Radio Sunlight Forecast

**WV**

**Morning flurries gives way to sunshine today, though colder**

HERE IS THE LATEST WEATHER SYNOPSIS FOR THE MIDDLE OHIO VALLEY AND CENTRAL APPALACHIANS... Colder air filters in for today. Clouds break today with sunshine returning. Any morning flurries across the mountains will warm by midday. A couple of weak systems will move across the area Saturday and Sunday, providing some light precipitation at times. A very strong cold front brings snow and another shot of Arctic air mid week. [Read More...](#)

**\*\* Click to view the latest Emergency Manager's Briefing (pdf) \*\***  
Updated: 10:20 AM EDT Sat Jan 19  
This briefing is updated each Monday and Friday, and more frequently during hazardous weather events.

Hazardous Weather Outlook Current Situation Winter Weather Rainfall & Flooding Thunderstorms Wind Fire Weather Tropics Long Range

**Hazardous Weather Outlook**  
Issued by NWS Charleston, WV

[Current Version](#) | [Previous Version](#) | [Graphics & Text](#) | [Print](#) | [Product List](#) | [Glossary](#) | [Versions: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26](#)

500  
FLOS41 ENWS 161226  
HWONS

Hazardous Weather Outlook  
National Weather Service  
326 AM EDT Tue Oct 16 2018

NY2101>103-105-OH2066-067-075-076-083>087-VA2003-004-WV2005>011-013>020-024>034-038-040-515>526-180730-  
Greenup-Carter-Boyd-Lawrence KY-Ferry-Morgan-Athens-Washington-Jackson OH-Vinton-Meigs-Gallia-Lawrence OH-Dickinson-Buchanan-Wayne-Cabell-Mason-Jackson WV-Wood-Pleasants-Tyler-Lincoln-Putnam-Kanawha-Roane-Wirt-Calhoun-Ritchie-Doddridge-Mingo-Logan-Boone-Clay-Braxton-Glimer-Lewis-Harrison-Taylor-McDowell-Wyoming-Upshur-Sarabour-Northwest Raleigh-Southeast Raleigh-Northwest Fayette-Southeast Fayette-Northwest Nicholas-Southeast Nicholas-Northwest Webster-Southeast Webster-Northwest Pocahontas-Southeast Pocahontas-Northwest Randolph-Southeast Randolph-326 AM EDT Tue Oct 16 2018

This Hazardous Weather Outlook is for northeast Kentucky, southeast Ohio, southwest Virginia and much of West Virginia.

.DAY ONE...Today and Tonight.

No hazardous weather is expected at this time.

.DAYS TWO THROUGH SEVEN...Wednesday through Monday.

A strong storm system will potentially impact the region over the upcoming weekends. This weather system will bring a threat for strong to potentially severe thunderstorms and heavy rainfall. Due to the saturated ground, flooding will be a potential hazard. Please monitor forecasts throughout the week as details on how this system will impact our region become clearer.

**SPOTTER INFORMATION STATEMENT**

Spotter activation is not expected at this time.

##  
JSF

Weather Hazard Outlooks

Forecast Maps

Days 0-7 Hazard Outlook

Days 8-14 Hazard Outlook

Days 15-24 Risk of Hazardous Temper

Days 25-30 Risk of Heavy Precip



# Severe Weather Risk Awareness

## Storms Prediction Center (SPC)

[www.spc.noaa.gov](http://www.spc.noaa.gov)



## Storm Prediction Center

NOAA / National Weather Service

HOME | NEWS | SPC PRODUCTS | WEATHER INFO | FORECAST TOOLS | RESEARCH | OUTREACH | NWS/NCEP

Search SPC...



### A Moderate Risk of Severe Thunderstorms is Forecast Today and/or Tonight

Severe thunderstorms capable of producing tornadoes, damaging winds, and isolated large hail will be likely over portions of the Gulf Coast states through tonight. A few strong tornadoes will be possible.

- » For additional details, see the current [Public Severe Weather Outlook \(PWO\)](#).
- » A [multi-media briefing](#) is also available.

Overview | Conv. Outlook | Watches | MDs | Storm Reports | Mesoanalysis | Fire | Hazards



SPC Activity Chart  
20160223/1536

National Weather Service  
Storm Prediction Center  
Norman, Oklahoma

Hazard	Tue (02/23)	Wed (02/24)	Thu (02/25)	Fri (02/26)	Sat (02/27)	Sun (02/28)	Mon (02/29)	Tue (03/01)
Severe	Moderate	Enhanced	No Thunder	No Area				
Fire	Critical	Critical	No Area					

All Products | Watches | MDs | Outlooks | Fire

**Day 2 Convective Outlook**  
- Categorical Risk: **Enhanced**  
- Issued: 4 minutes ago

**TORNADO 0019**  
- Valid until: 02/23/2016 2300Z  
- States affected: LA MS GM CW  
- Issued: 20 minutes ago

**Thunderstorm Outlook**  
- Issued: 45 minutes ago

**Mesoscale Discussion 0123**  
- Concerning: SVR  
POTENTIAL WATCH POSSIBLE  
- Issued: 46 minutes ago

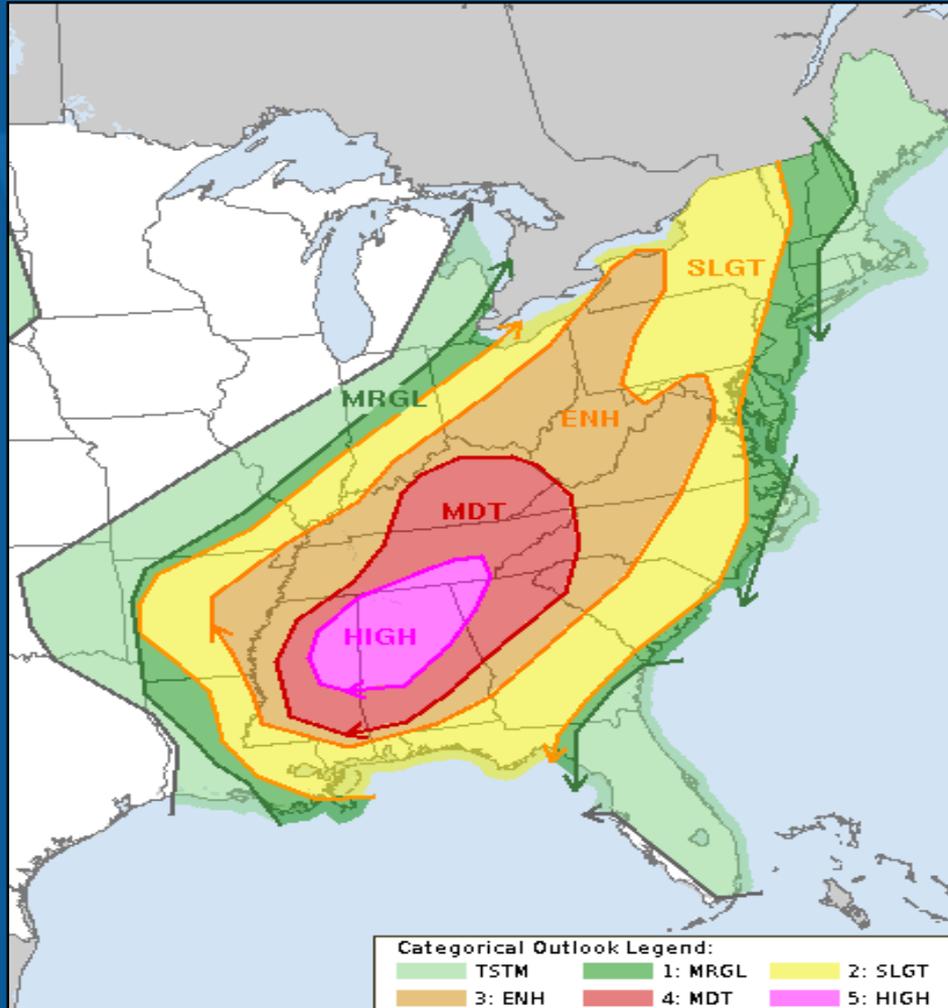
**Day 1 Convective Outlook**  
- Categorical Risk: **Moderate**  
- Issued: 02/23/2016 at 1630Z



# Severe Weather Risk Awareness

Storms Prediction Center (SPC)

[www.spc.noaa.gov](http://www.spc.noaa.gov)



## 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
<ul style="list-style-type: none"> <li>Winds to 40 mph</li> <li>Small hail</li> </ul>	<ul style="list-style-type: none"> <li>Winds 40-60 mph</li> <li>Hail up to 1"</li> <li>Low tornado risk</li> </ul>	<ul style="list-style-type: none"> <li>One or two tornadoes</li> <li>Reports of strong winds/wind damage</li> <li>Hail ~1", isolated 2"</li> </ul>	<ul style="list-style-type: none"> <li>A few tornadoes</li> <li>Several reports of wind damage</li> <li>Damaging hail, 1 - 2"</li> </ul>	<ul style="list-style-type: none"> <li>Strong tornadoes</li> <li>Widespread wind damage</li> <li>Destructive hail, 2" +</li> </ul>	<ul style="list-style-type: none"> <li>Tornado outbreak</li> <li>Derecho</li> </ul>

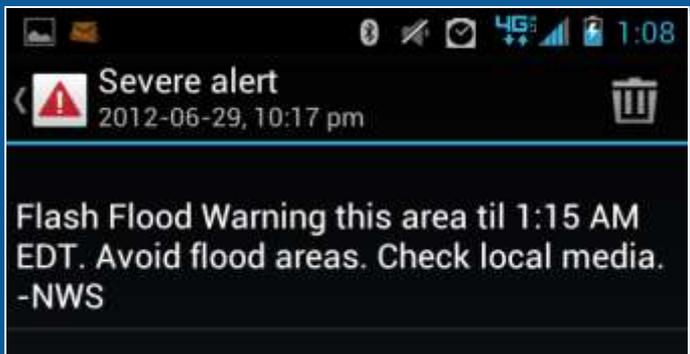
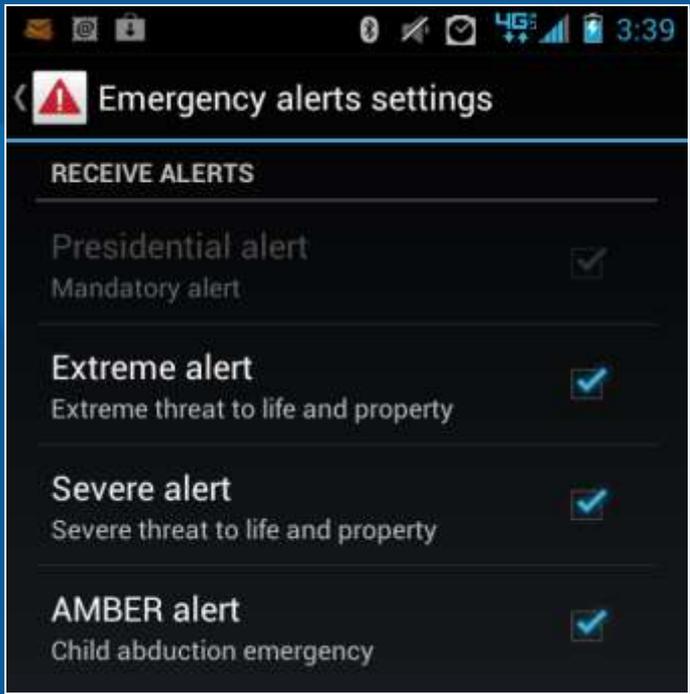
\* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles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

Chance of severe weather within 25 miles of a point



# Severe Weather Alerts

## Wireless Emergency Alerts (WEA)



### Alert Categories

- Presidential
- Imminent threat to life and property (e.g., severe weather, HazMat, earthquake)
- AMBER Alert/child abduction

### Alert Message Content (90 characters)

- What is happening
- Area affected
- Til time
- Recommended action
- Alert originator

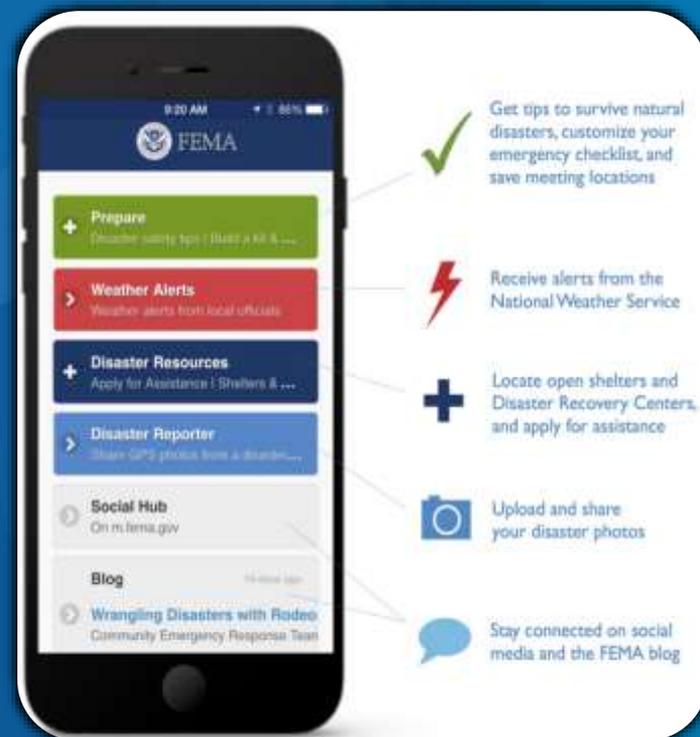
Warning Type
Tsunami Warning*
Tornado Warning
Extreme Wind Warning
Hurricane Warning
Typhoon Warning
Flash Flood Warning
Dust Storm Warning



# Severe Weather Alerts

## Smartphone Apps

- **FEMA**
  - ALL NWS alerts for up to 5 locations
  - Android, Apple, and BlackBerry
- **Red Cross Apps**
  - Two apps with alerts and safety information (Android and Apple)
  - Emergency App: 35 different severe weather and emergency alerts
  - Tornado App: Tornado Watch and Warning Alerts
    - Audible siren for Tornado Warnings





# Severe Weather Alerts

## NOAA Weather Radio



- Programmable
- Battery back-up during power outages
- Tone alerts for warnings when not in use



# Disaster Kits

- **Water**, one gallon of water per person per day for at least three days
- **Food & medicine/prescriptions**, at least a three-day supply
- **Radio**, battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both
- **Flashlight and extra batteries**
- **First aid kit**
- **Whistle** to signal for help
- **Dust mask** to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place
- **Moist towelettes, garbage bags and plastic ties** for personal sanitation
- **Wrench or pliers** to turn off utilities
- **Manual can opener** for food
- **Local maps**
- **Cell phone with chargers, inverter or solar charger**



<http://www.ready.gov/basic-disaster-supplies-kit>



# Tornado Safety

**Wind Blown Debris is the Greatest Danger in a Tornado**



**May 10, 2016 – Mayfield, KY EF-3 Tornado**





# Tornado Safety

## If You Live in a House

Menifee County, KY – 3/2/2012



Underground is the only safe place to be in a strong tornado (EF2 or greater).

Get in a basement or storm shelter if available.

If no basement is available, get in an interior room away from windows.

**Underground or in a Basement is Best!**



# Tornado Safety

## If You Live in a Mobile Home

Don't wait for the warning...get out and go to a neighbor/relative's house with a basement as early as possible, or get into a storm shelter.

Lie down in a ditch or culvert as a **last resort** but do not ride out a tornado in a mobile home.



**Mobile Homes are Not Safe in a Tornado!!!**



# Tornado Safety

## If You are Traveling

-Consider delaying your trip if severe thunderstorms are in the area or along your path of travel.

-If enough time, get in a sturdy building on the lowest floor. Walk-in coolers make good storm shelters in convenience stores, etc.

-Find shelter in a ditch, culvert or low spot as a last resort.

**-Highway overpasses are NOT tornado shelters!**



Courtesy K-M Equipment Leighton, AL & WHNT-TV Huntsville, AL





# Thunderstorm Safety

**Treat Severe Thunderstorm Warnings Seriously!**



***Straight Line Winds Can Be As Destructive as a Tornado***





# Flood Safety

**Water may be over a road you know very well...**



**...but under that water the road may have been washed away**



# Flood Safety

**Turn Around, Don't Drown!**





# Flood Safety

**Move to Higher Ground Early – Do Not Wait Until Last Minute**

**Do Not Attempt to Cross Flowing Streams**

**Do Not Drive Around Road Closed Signs or Barriers**

**2 Feet of Flowing Water will Carry Away Most Vehicles**





# Report Flooding

**Call 911 If Lives are Threatened**



**Provide Specific Location Information**  
**Roads - Intersections - Creek Names**





# Spotter Training Outline

## Section 1: Lessons from the Past

- Tornado history and climatology

## Section 2: The Role of the Weather Spotter

- National Weather Service – Who We Are and What We Do
- Why We Need Spotters?
- How and What to Report

## Section 3: Thunderstorms

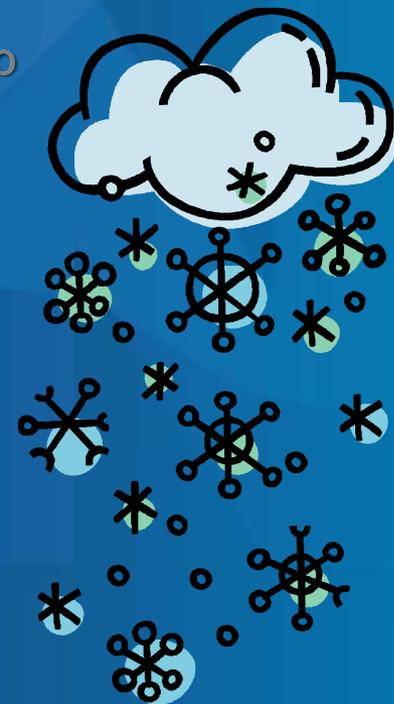
- Ingredients...Anatomy...and Varieties
- Severe Thunderstorm Spotting Concepts
- Cloud Identification

## Section 4: Staying Safe in Severe Weather

- Outlooks, Watches and Warnings – Oh my!
- Severe Weather Risk Awareness Resources and Apps
- Safety Basics

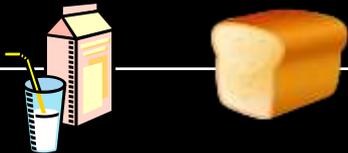
## Section 5: Winter Weather Spotting

## Section 6: Review & Quiz





# Winter Weather Spotting

Winter Storm Watch	Winter Weather Advisory	Winter Storm Warning
Warning Conditions Are Possible	1 to 4 Inches of Snow Less than ¼ Inch of Ice	4 Inches of Snow or More (criteria varies) ¼ inch of Ice or More
 Issued 12 to 60 Hours in Advance	Issued up to 36 Hours in Advance	Issued up to 36 Hours in Advance
You Should Prepare for Winter Weather NOW	Hazardous Travel Conditions Minor Inconveniences	Stay Indoors-Avoid Travel High Potential for Life Threatening Conditions

**Media broadcasts our watches, warnings and advisories, but doesn't have to agree with our forecast.**





# Winter Weather Spotting

## What to Report



### \*\* Snow, Sleet & Freezing Rain Amounts \*\*

Any Occurrence of Freezing Rain

Changing Precipitation Types

Rain – Freezing Rain – Snow

Snow – Sleet – Rain

Report Precip  
Type Easily Using  
mPing App!





# Winter Weather Spotting



## 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

Record your total to the nearest tenth of an inch



Wipe the board off after measuring

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



SEND us your report!



# Let's Review...

## Spotter Hotline

Who you are

What weather is occurring or has occurred

When did this weather happen

Where the weather took place

**Stay Calm and Be Specific - Do Not Exaggerate Reports**



# Let's Review...

## What to Report



### Tornadoes



### Funnel Clouds Rotation?





# Let's Review...

## What to Report



### Wall Clouds



(c) 2003 C. DeWitt



### Wind or Storm Damage

Even if it  
happened in the  
recent past.





# Let's Review...

## What to Report



### Hail

Largest Stone?



Flooding  
or  
Heavy Rainfall





# Let's Review...

## What to Report



### \*\* Snow, Sleet & Freezing Rain Amounts \*\*

Any Occurrence of Freezing Rain

Changing Precipitation Types

Rain – Freezing Rain – Snow

Snow – Sleet – Rain

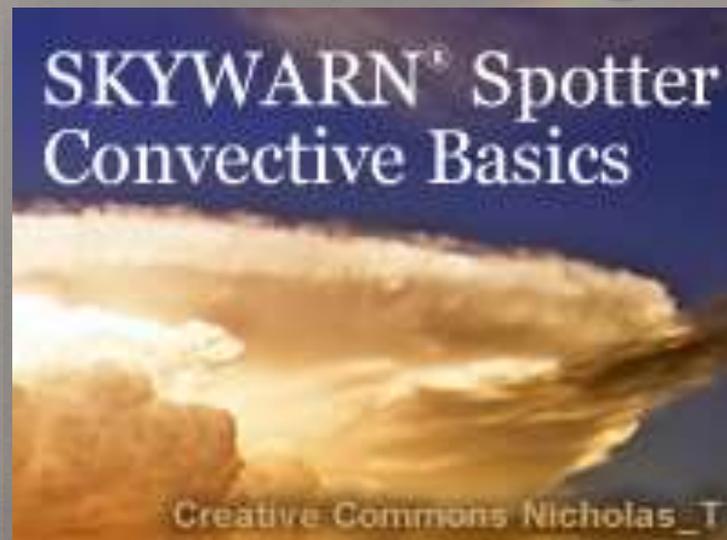
Report Precip  
Type Easily Using  
mPing App!





Thanks for coming!

# For Additional Training



[weather.gov/rlx/skywarn](http://weather.gov/rlx/skywarn)

Email: [Tony.Edwards@noaa.gov](mailto:Tony.Edwards@noaa.gov)

