

Back to Basics: Understanding Weather Concepts and Making Weather-Based Decisions

Brad Jakubowski and Matt Neri



Game day weather decisions.
Hoping for the best, preparing for the worst.

The 3 C's

- Communication
- Composure
- Confidence



Today's Agenda

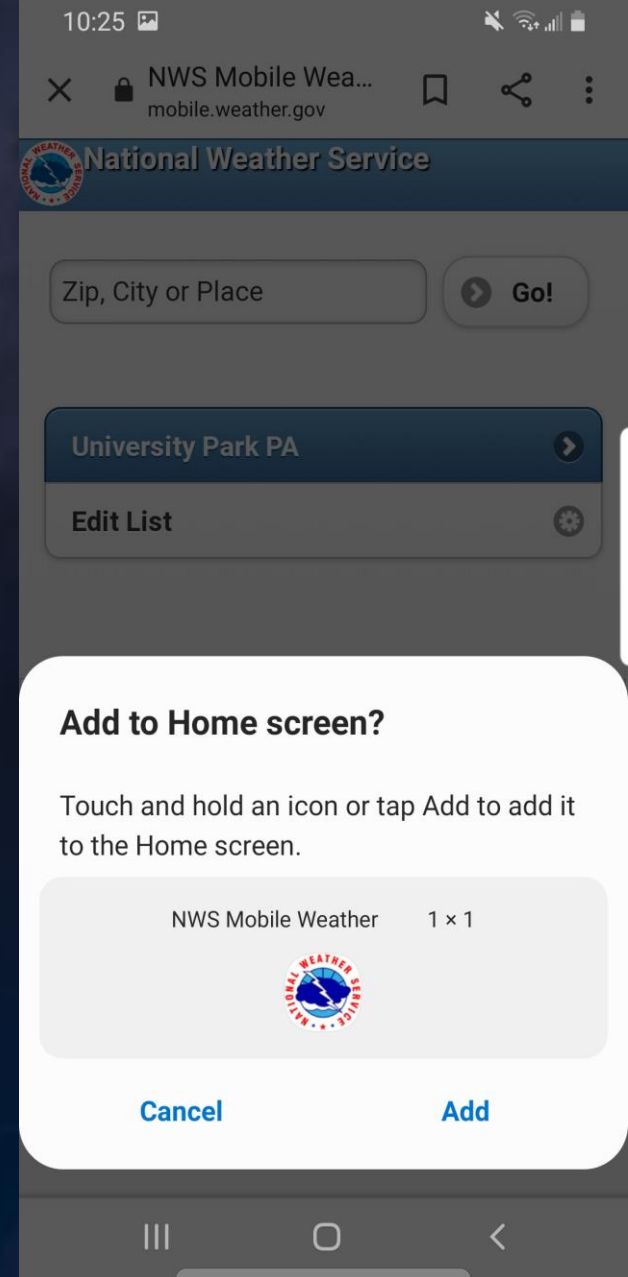
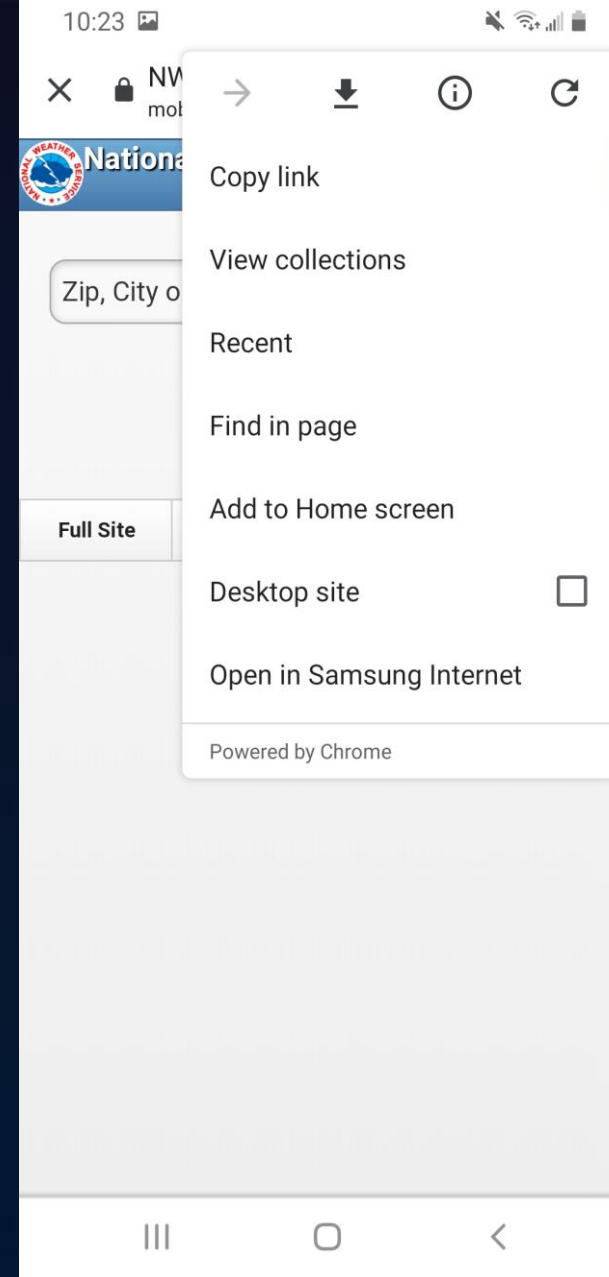
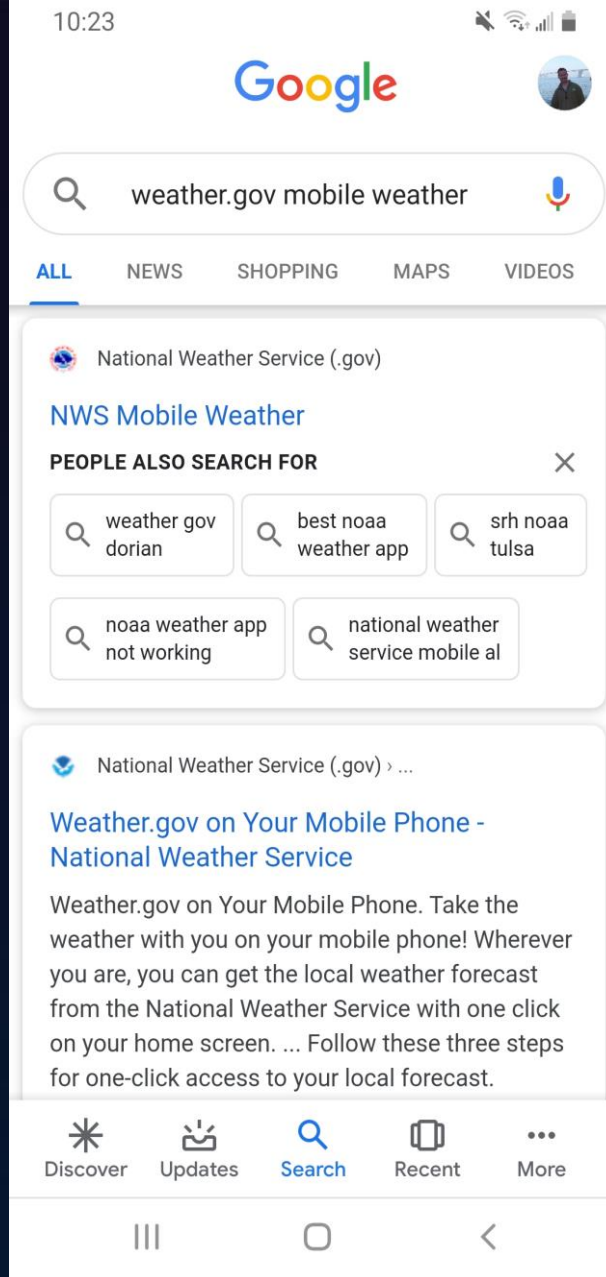
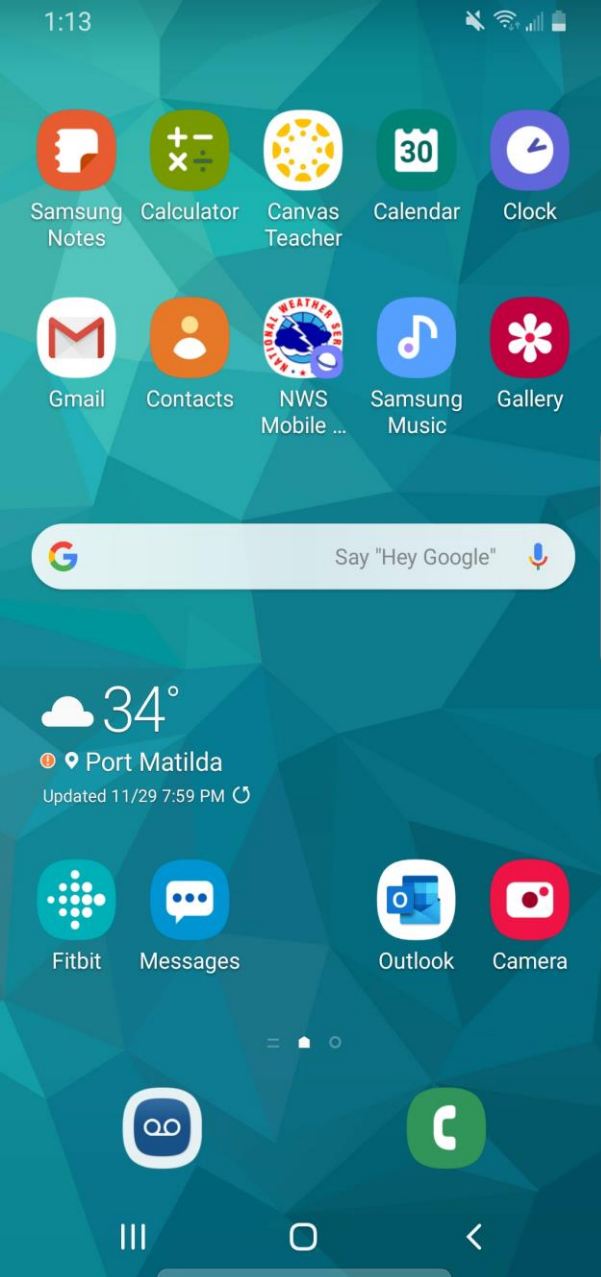
- Visual and Virtual Clues for Inclement Weather
- Digging Deeper into Radar Data
- Making the Call

What process do we have in place?

How do we communicate our concerns?

How do we put our decisions into action?

- Lightning Safety Policy
- Final Thoughts







One Call
for One World
of Healing.
1-800-SCRIPPS



Mammatus Sky – Hail may be coming







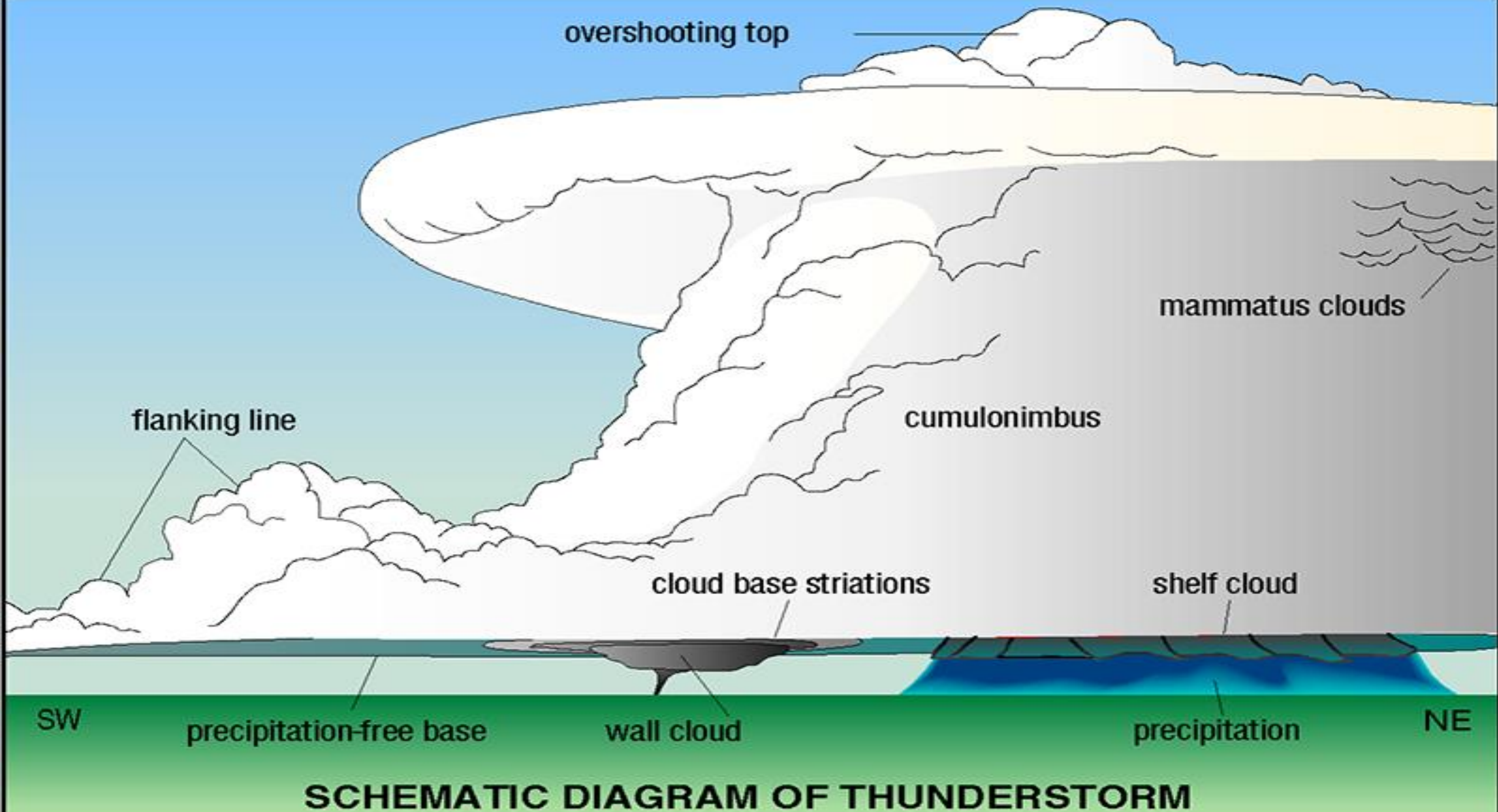
Shelf Cloud



What can we expect when we see this?

Shelf Cloud



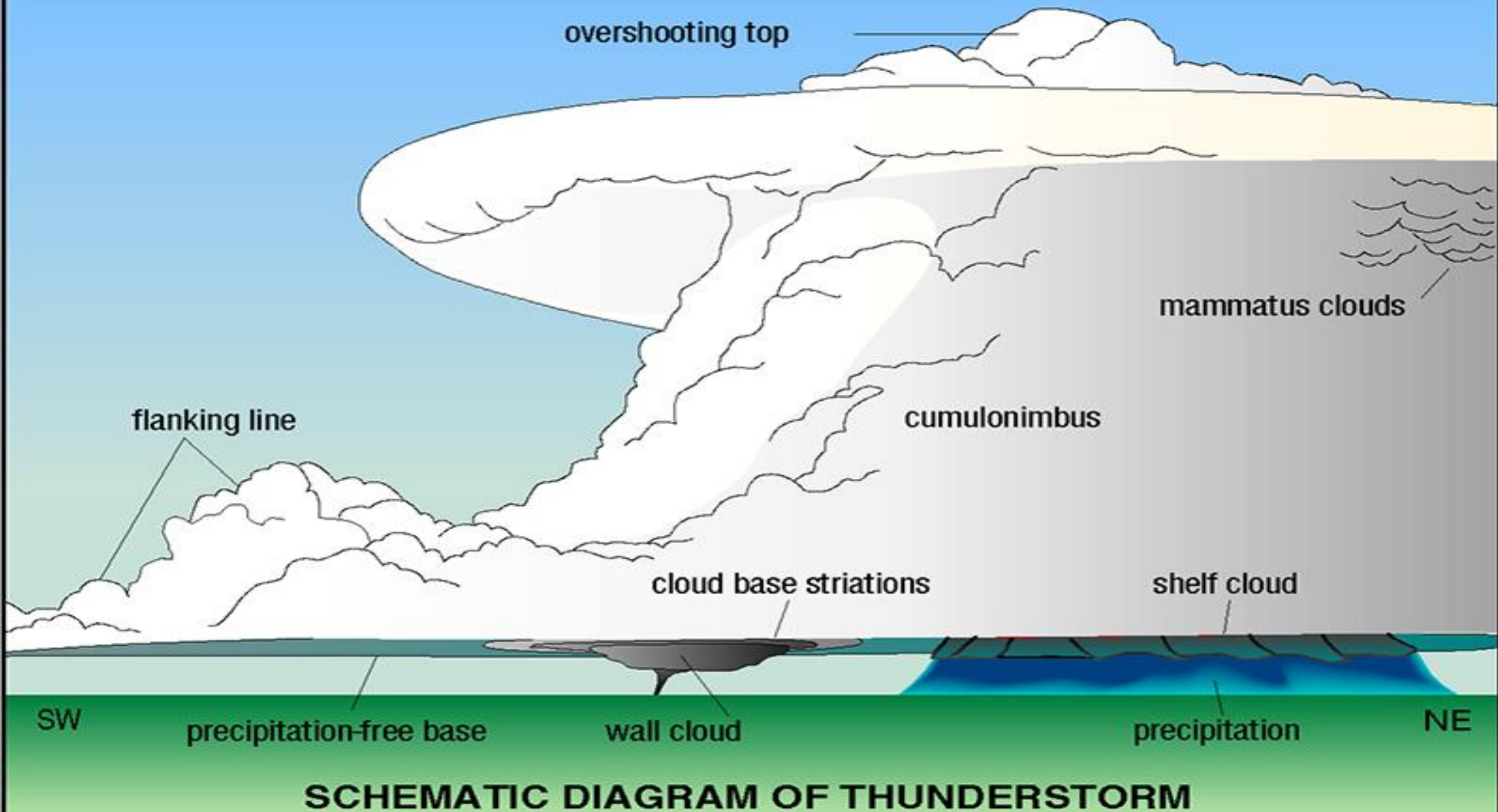




Wall Cloud

Shelf Cloud





SCHEMATIC DIAGRAM OF THUNDERSTORM

Shelf Cloud

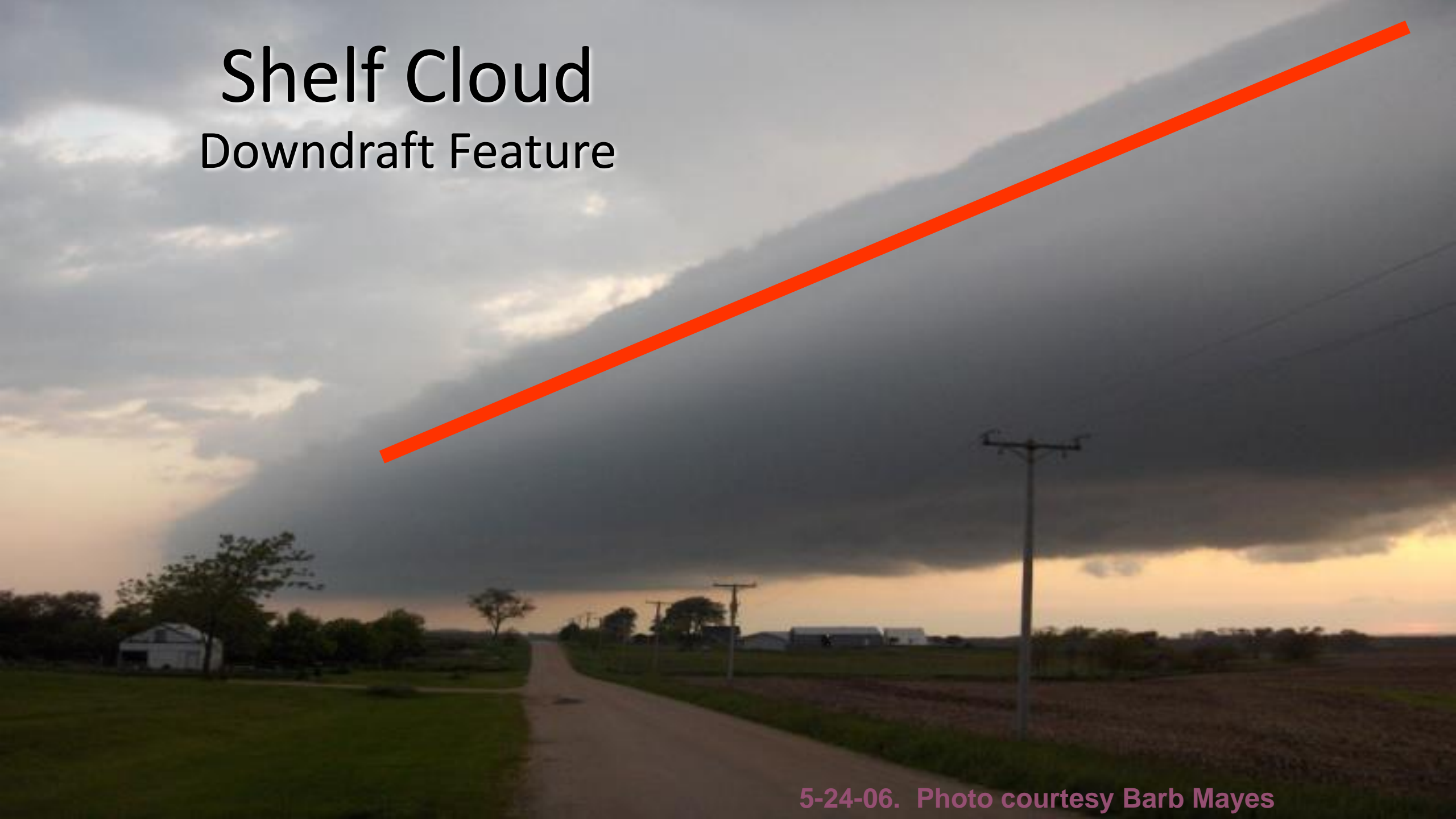


Shelf Cloud



Shelf Cloud

Downdraft Feature



5-24-06. Photo courtesy Barb Mayes

Shelf Cloud

Downdraft Feature







13 EXACTRACK HD

7:05 PM

SEVERE THUNDERSTORM WATCH DANGEROUS WEATHER IS POSSIBLE - BE READY TO SEEK SHELTER

Severe Thunderstorm Watch
Rock Co.
Expires: 2:00 AM



WATCH



- Issued by the Storm Prediction Center
- Timeframe: Hours ahead. Be alert.
- Watch area is large, covering numerous counties and even states
- Severe weather is possible in and near the watch area

WARNING



- Issued by your local forecast office
- Timeframe: Now! Take shelter!
- Warning area is small, around the size of a city or county
- Severe weather has been reported by spotters or indicated by radar



Storm Prediction Center

NOAA / National Weather Service

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

Search SPC...

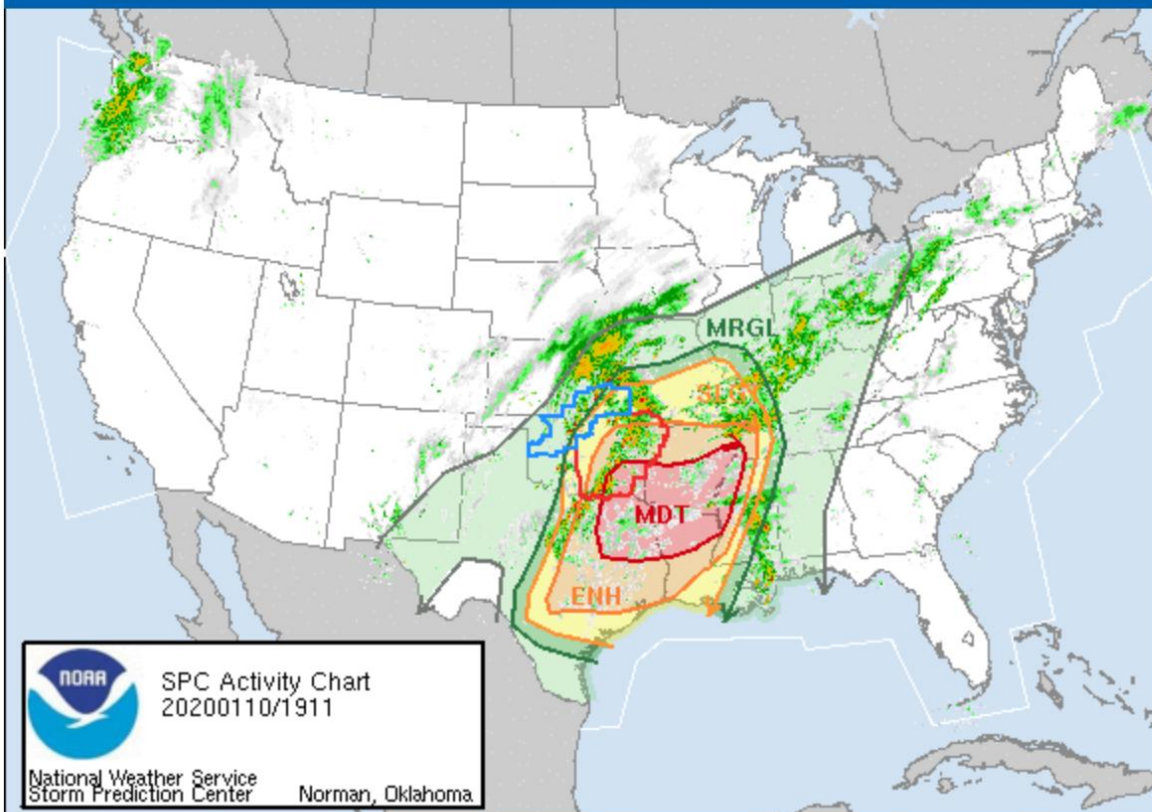


A Moderate Risk of Severe Thunderstorms is Forecast Today and/or Tonight

Widespread severe thunderstorms are likely across the southern Great Plains, mainly this afternoon and evening, spreading east into the Lower Mississippi Valley tonight. The most dangerous corridor for strong tornadoes and intense damaging winds should be centered on northeast Texas through northern Louisiana and southern Arkansas this evening through the overnight.

» For additional details, see the current [Public Severe Weather Outlook \(PWO\)](#).

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




SPC Activity Chart
20200110/1911

National Weather Service
Storm Prediction Center
Norman, Oklahoma

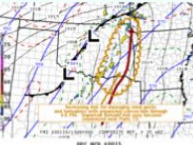
Hazard	Fri (01/10)	Sat (01/11)	Sun (01/12)	Mon (01/13)	Tue (01/14)	Wed (01/15)	Thu (01/16)	Fri (01/17)
Severe	Moderate	Enhanced	Marginal	No Area	No Area	No Area	No Area	No Area
Fire	Enhanced	No Critical	No Area	No Area	No Area	No Area	No Area	No Area

All Products | Watches | MDs | Outlooks | Fire




[Day 1 Convective Outlook](#)

- Categorical Risk: **Moderate**
- Issued: 51 minutes ago




[Mesoscale Discussion 0015](#)

- Concerning: TORNADO WATCH
- Issued: 01/10/2020 at 1944Z




[TORNADO 0003](#)

- Valid until: 01/11/2020 0300Z
- States affected: TX
- Issued: 01/10/2020 at 1915Z



[Day 2 Fire Weather Outlook](#)

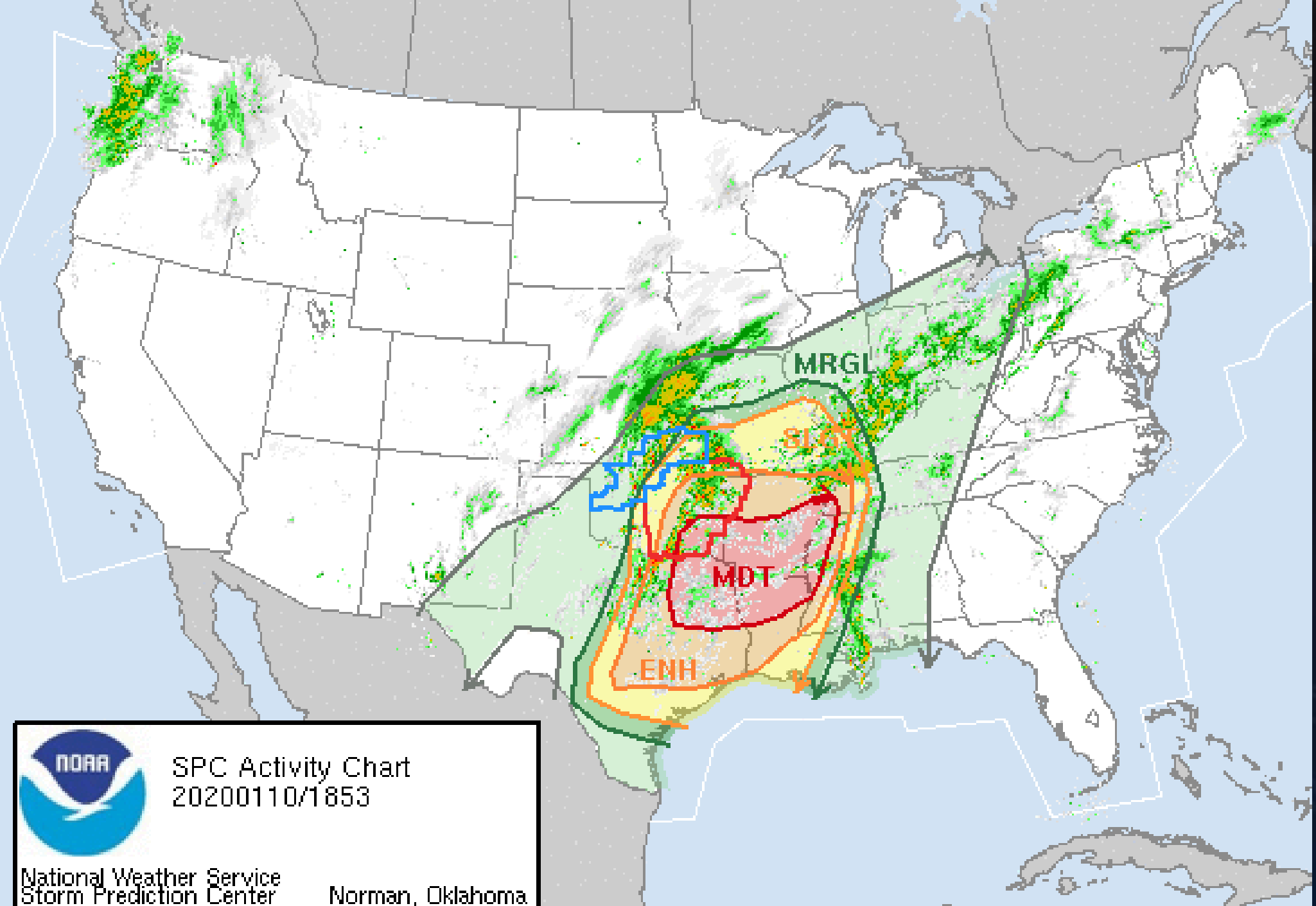
- Categorical Risk: **No Critical**
- Issued: 01/10/2020 at 1902Z



[Mesoscale Discussion 0013](#)

- Concerning: FREEZING RAIN
- Issued: 01/10/2020 at 1854Z

[Day 2 Convective Outlook](#)



SPC Activity Chart
20200110/1853

National Weather Service
Storm Prediction Center Norman, Oklahoma

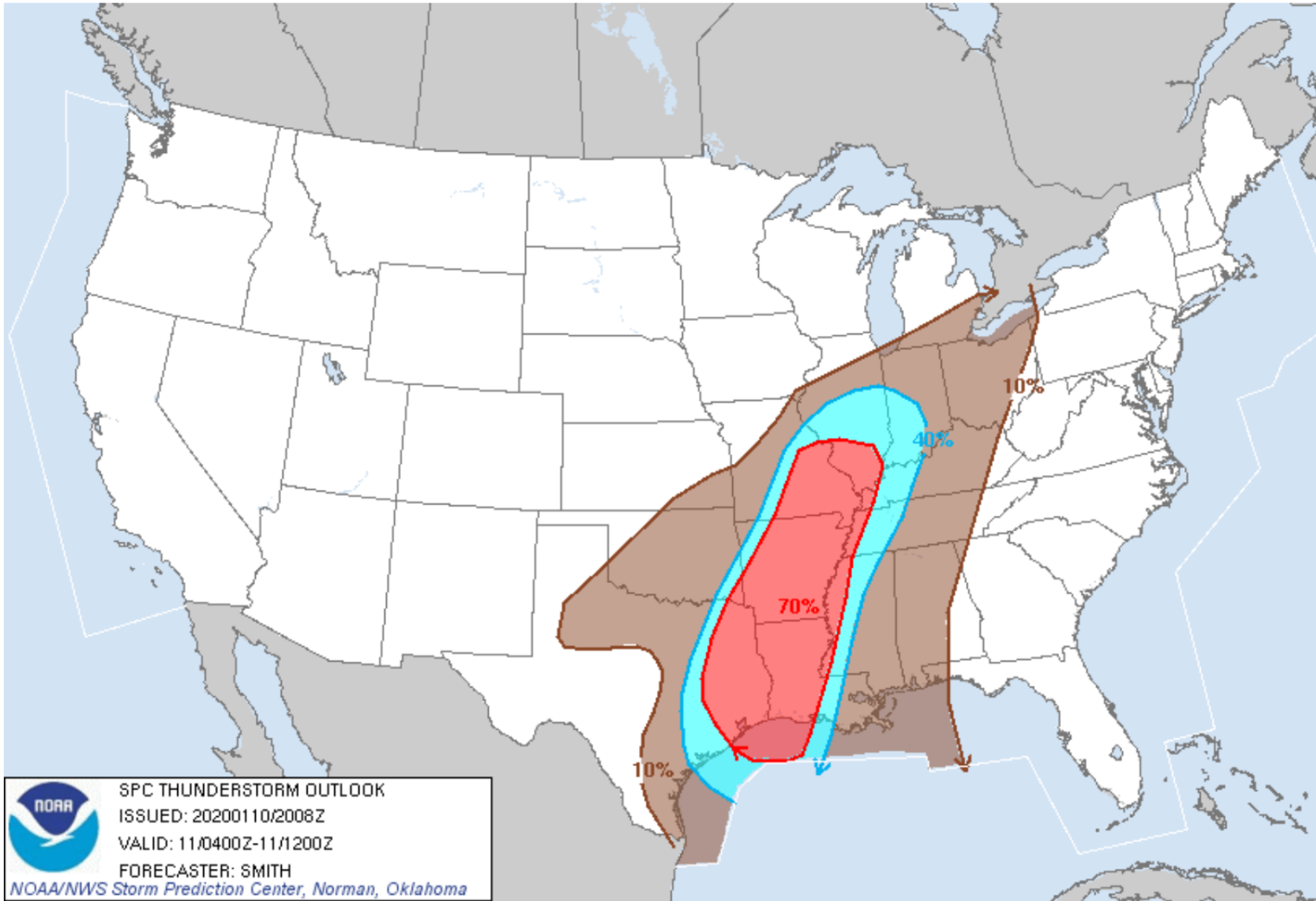
SPC Jan 10, 2020 2000Z Thunderstorm Outlook

Fri Jan 10 20:09:02 UTC 2020

00Z-04Z

04Z-12Z

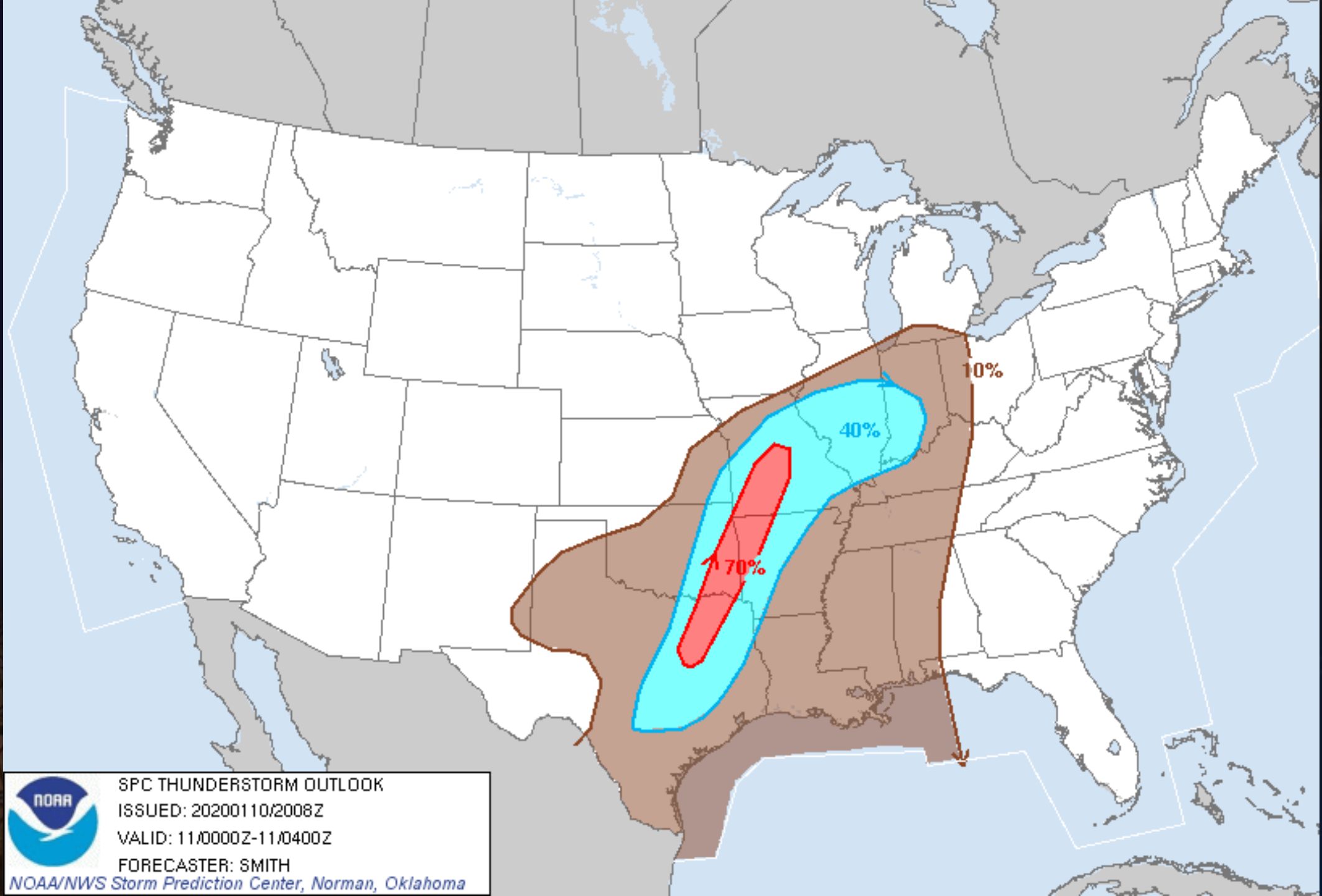
Pop. Cities/Towns CWAs RFCs Interstates ARTCCs FEMA Regions



Forecast valid: 11/0400Z-11/1200Z

For more information about this product, please see the [Thunderstorm Outlook](#) section of the [SPC Products page](#).

[Retrieve Previous SPC Thunderstorm Outlooks](#)




SPC THUNDERSTORM OUTLOOK

ISSUED: 2020110/2008Z


VALID: 11/0000Z-11/0400Z

FORECASTER: SMITH

NOAA/NWS Storm Prediction Center, Norman, Oklahoma

 Tornado Warning	 Tornado Watch
 Severe T-Storms Warning	 Severe T-Storms Watch

Bloomington
Indiana

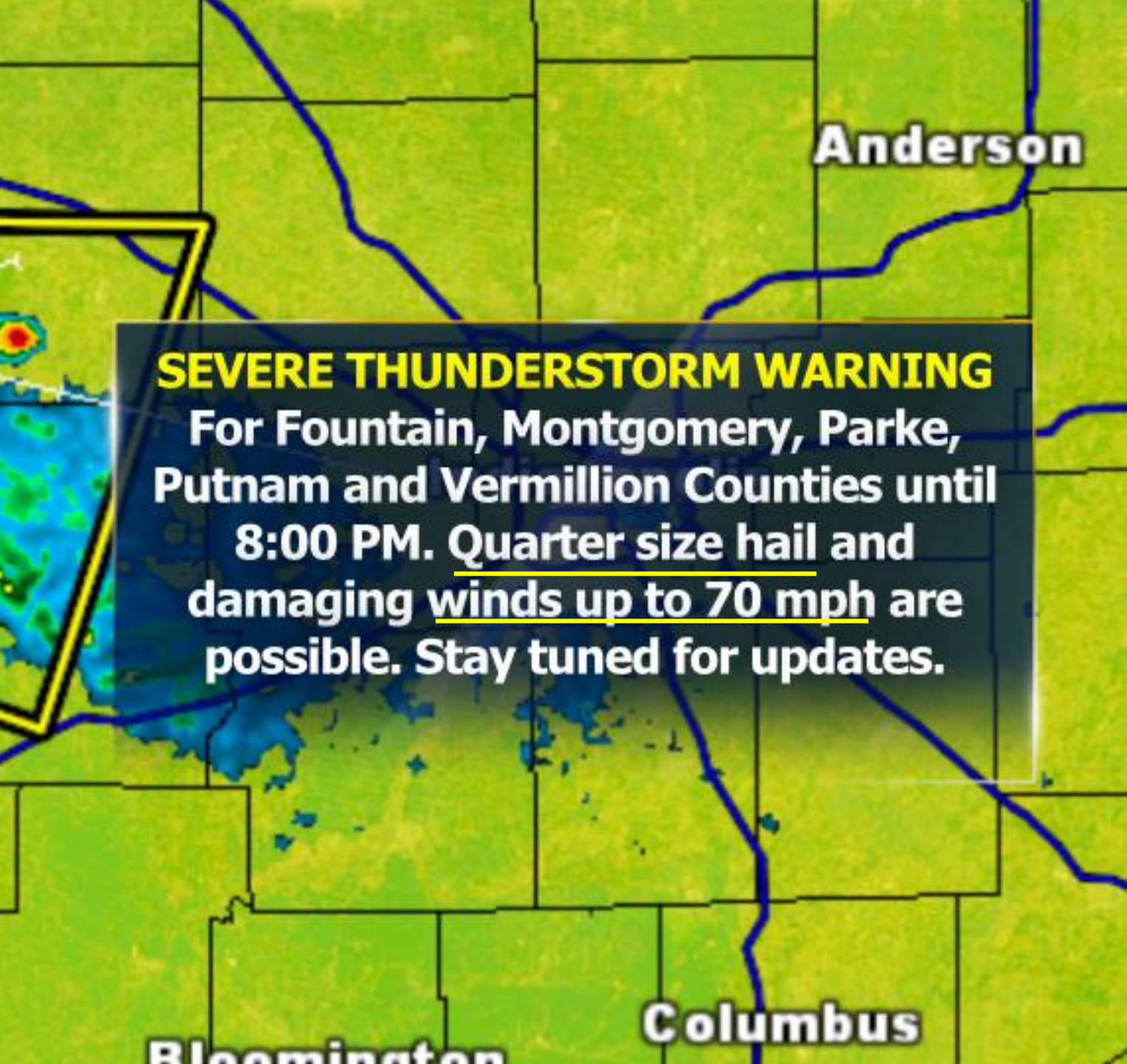
 Alert

A Severe Thunderstorm Warning for Louisville, KY is in effect until Wednesday, September 05 2012 at 04:00:00 PM EDT

Clarksville
Nashville

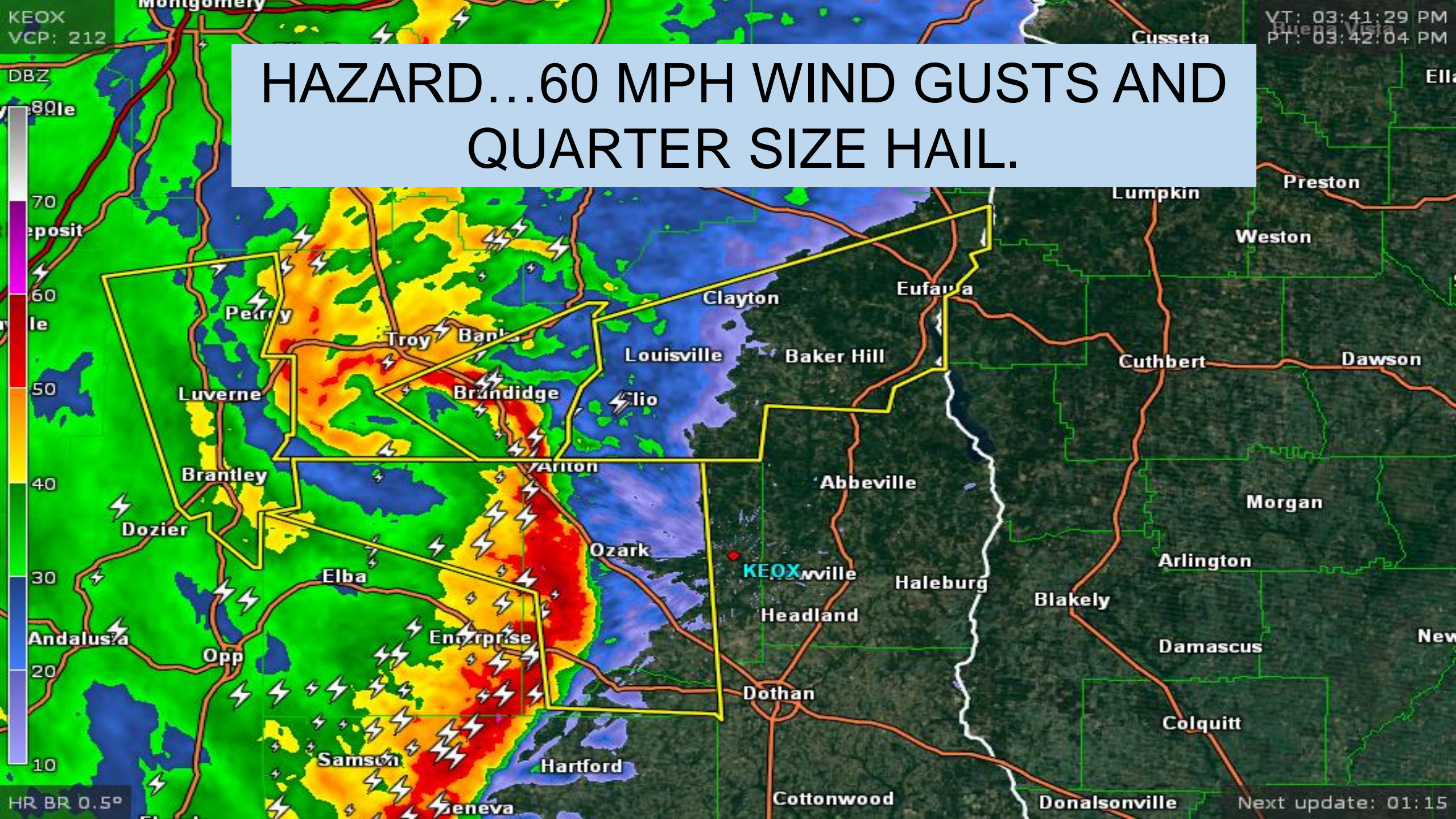
RAIN MIXED SNOW

Storms/Tornadoes

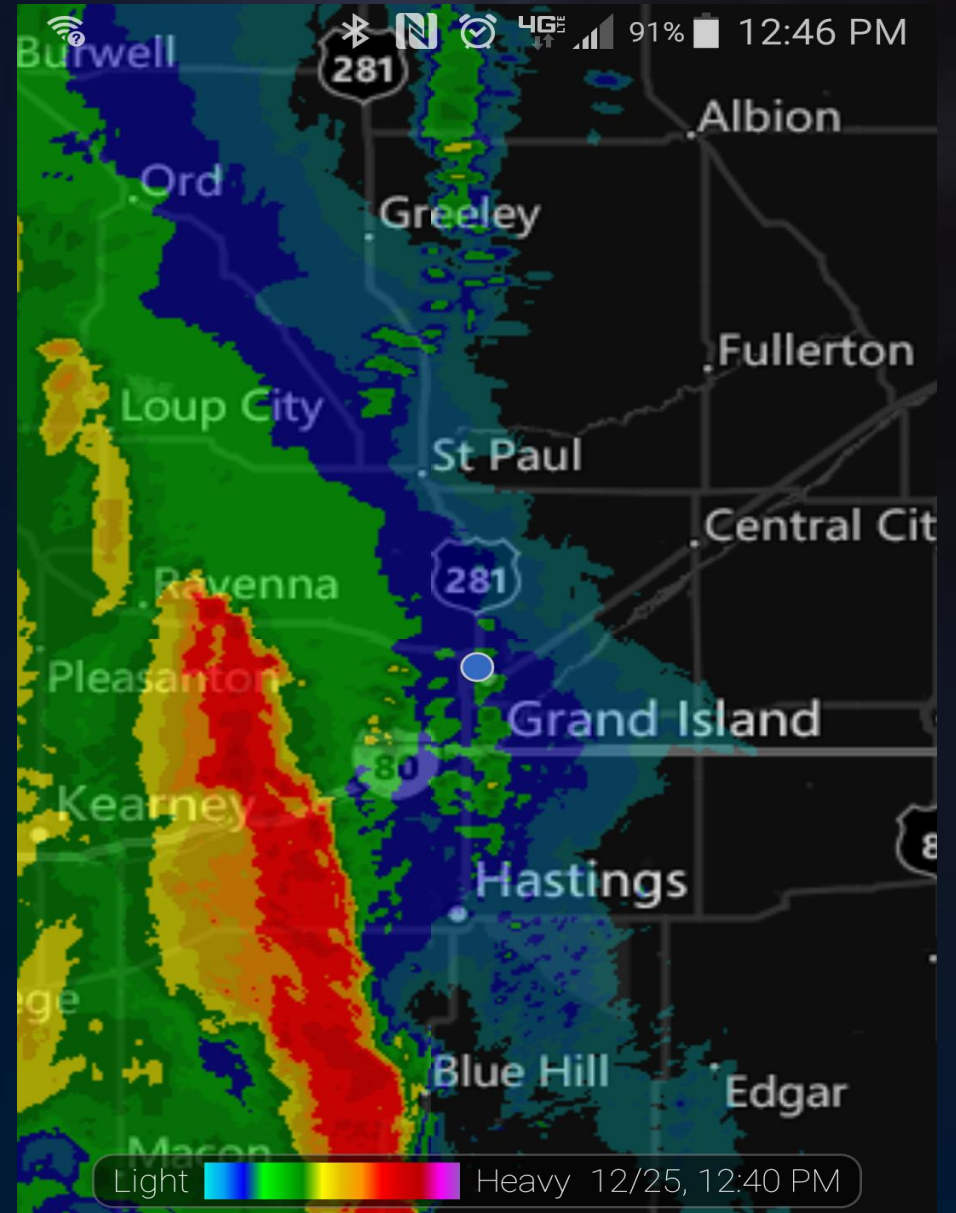
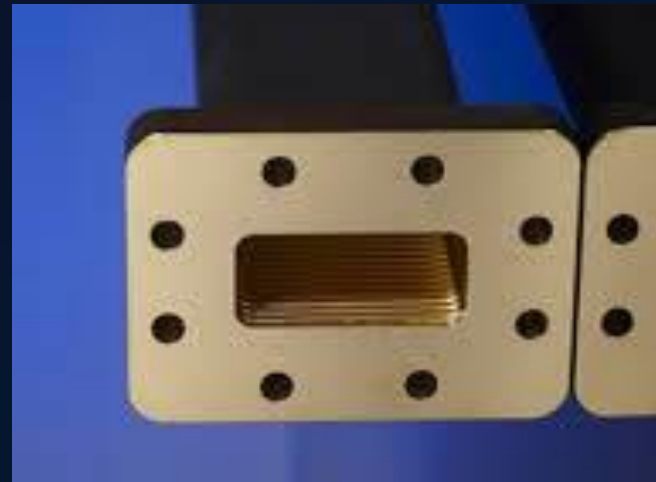
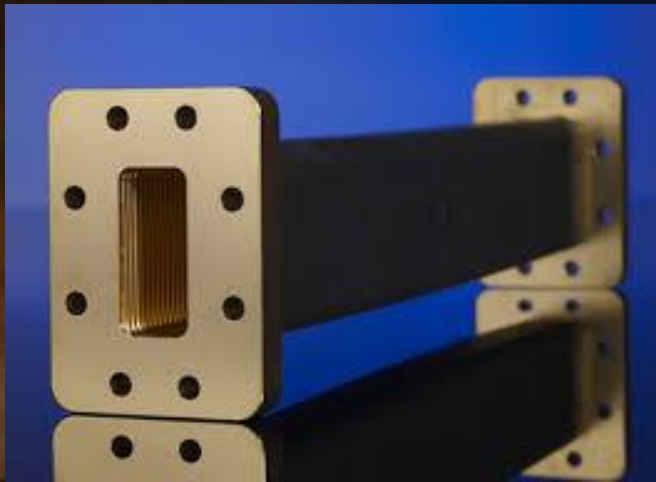
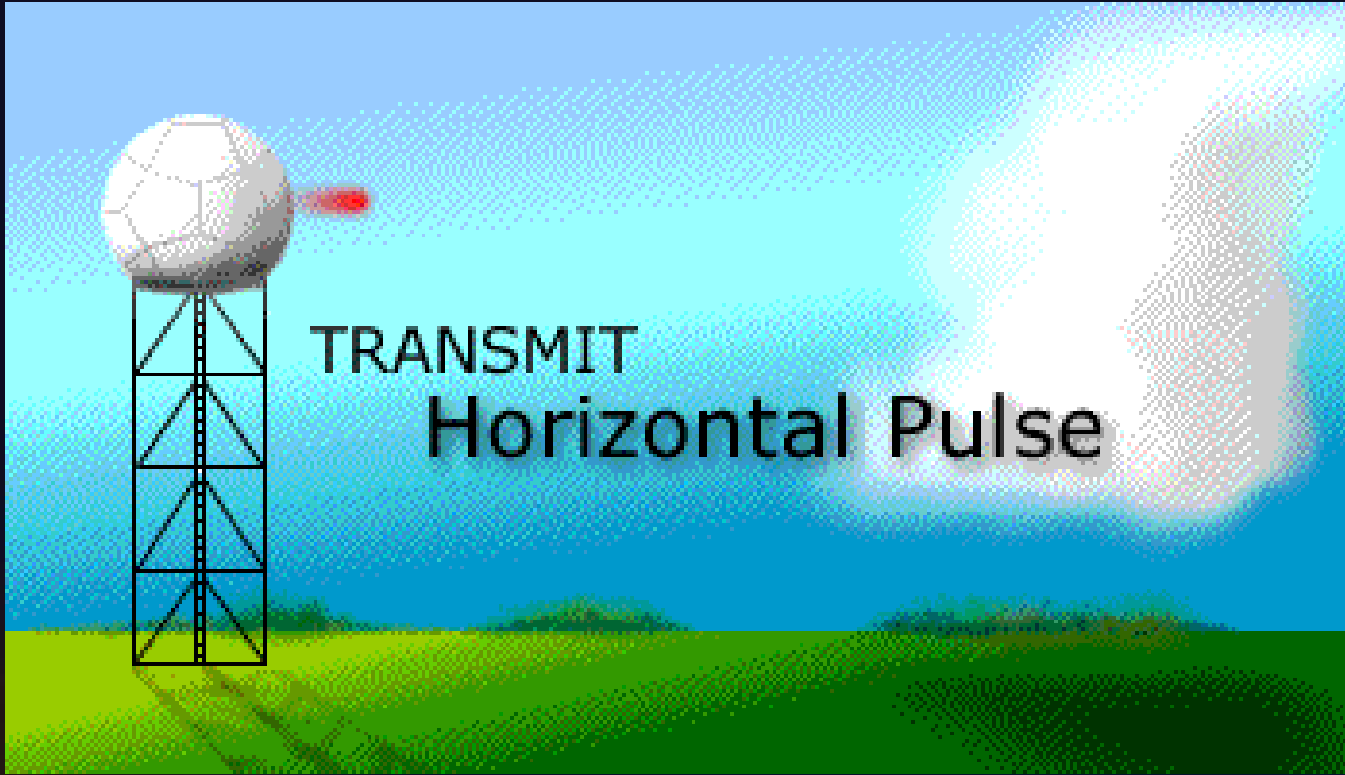


SEVERE THUNDERSTORM WARNING
 For Fountain, Montgomery, Parke,
 Putnam and Vermillion Counties until
**8:00 PM. Quarter size hail and
 damaging winds up to 70 mph are
 possible. Stay tuned for updates.**

HAZARD...60 MPH WIND GUSTS AND
QUARTER SIZE HAIL.



Radar Imaging





- *Doppler radar sends the energy in pulses and listens for any returned signal.*
- *Signal is measured in decibals DBz*
 - Value of 20 dBZ ~ the point at which light rain begins.
 - 60 to 65 dBZ ~ the level where 1" diameter hail can occur.

Base Reflectivity

Near the radar, the beam is lower to the ground and “sees” low in the storms.

As distance increases, the beam’s altitude also increases and can overshoot the core of heavier precipitation.

Radar beam

At increasing distance, the radar is viewing higher and higher in storms and the beam may overshoot the most intense parts

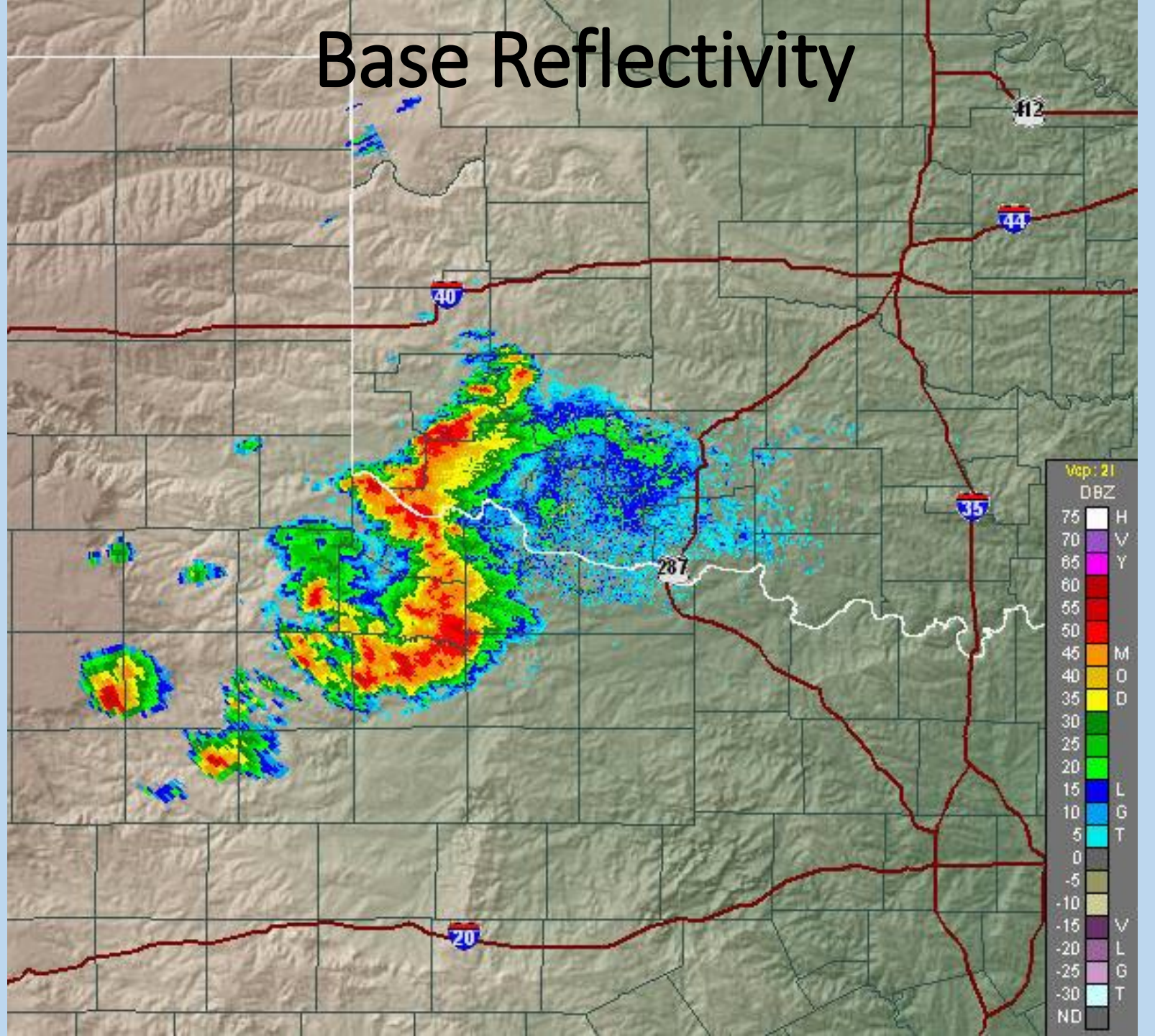




REFLECTIVITY PRODUCTS

- SuperRes Reflectivity
- Base Reflectivity
- Precipitation Depiction
- Classic Reflectivity
- Classic Reflectivity 248 nmi
- Composite Reflectivity

- Tilt 1
- Tilt 2
- Tilt 3
- Tilt 4

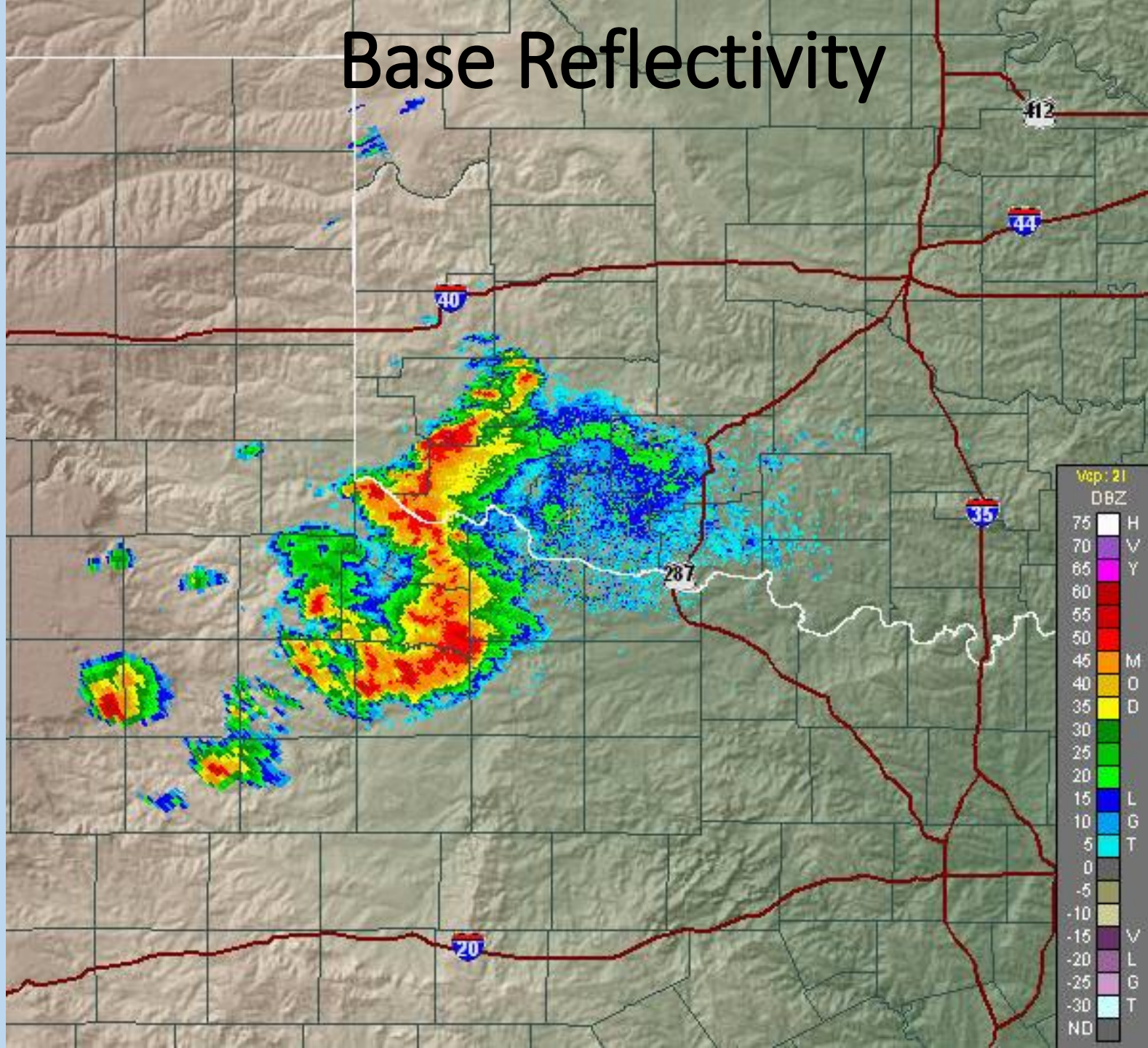


Composite Reflectivity

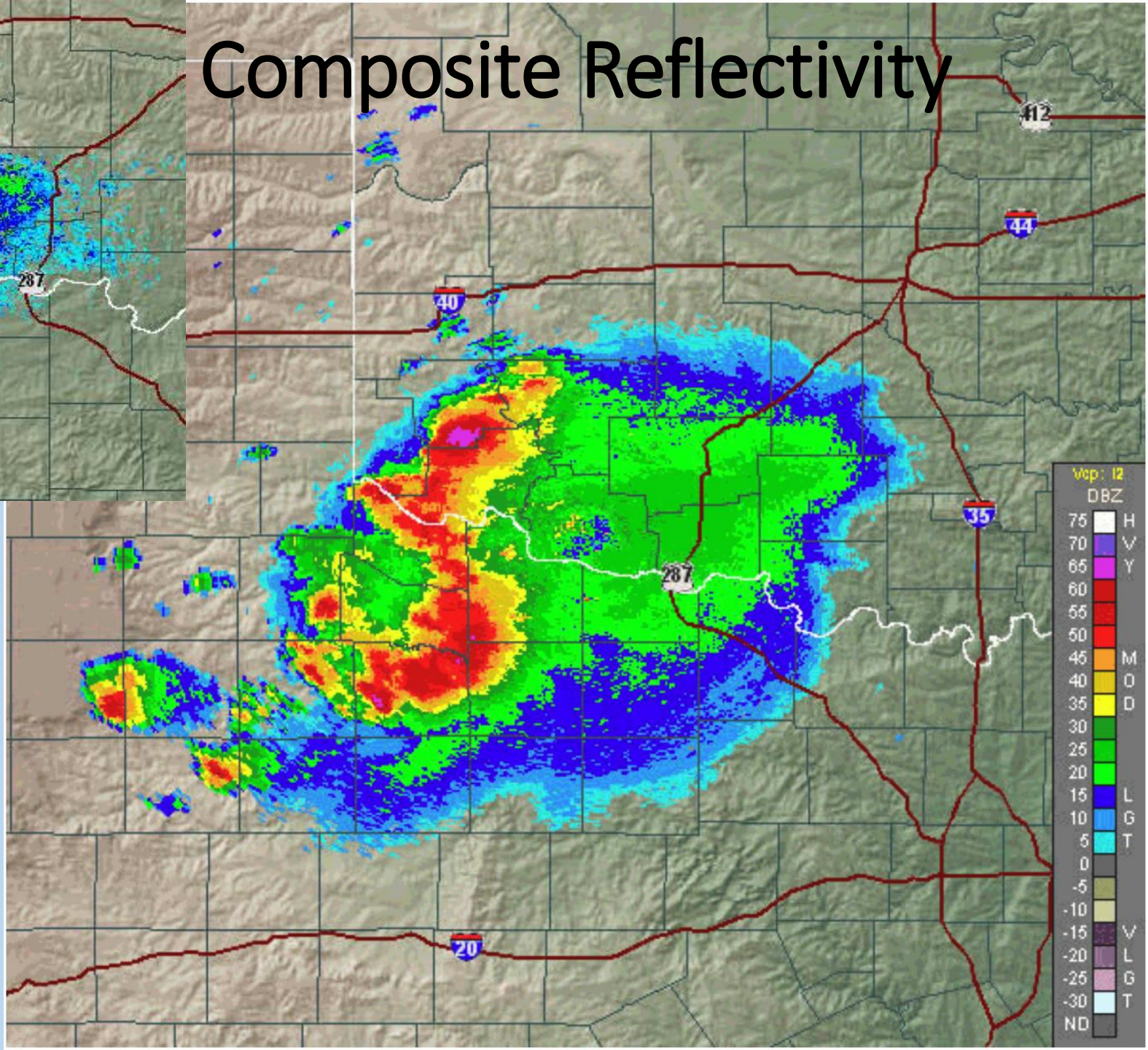
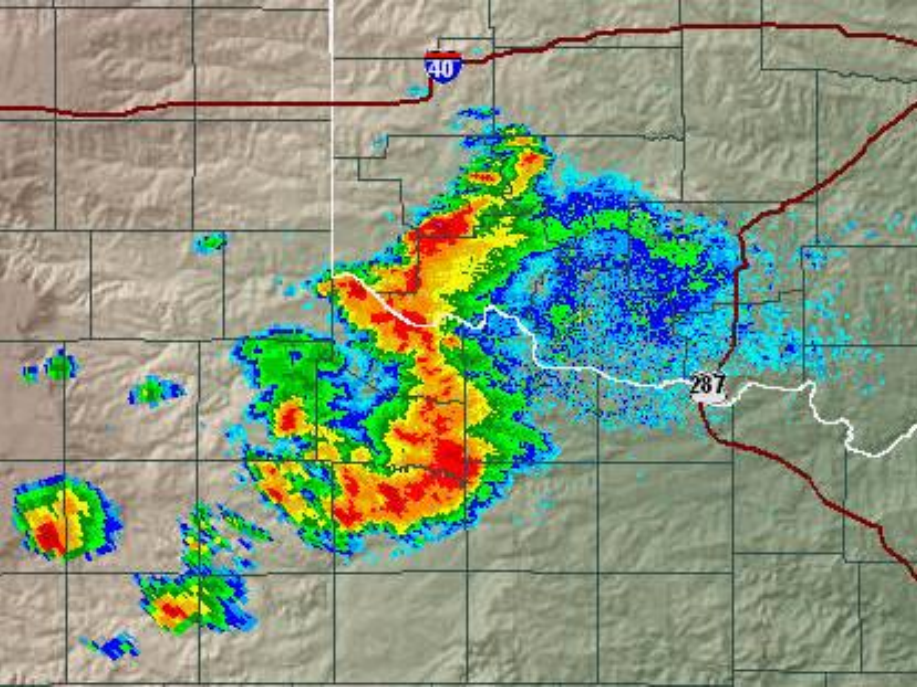


Looks at ALL elevation scans in order to create an image.

Base Reflectivity

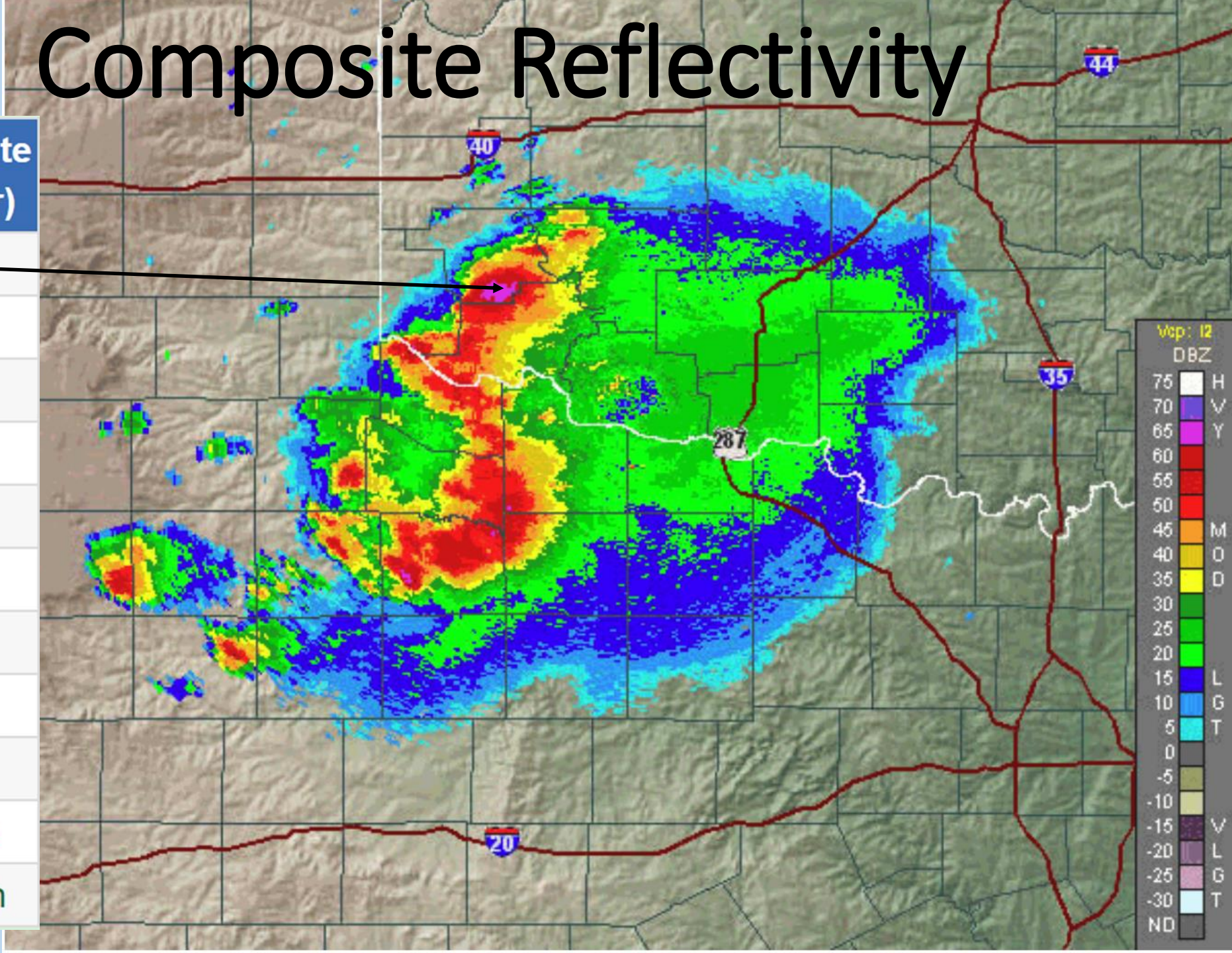


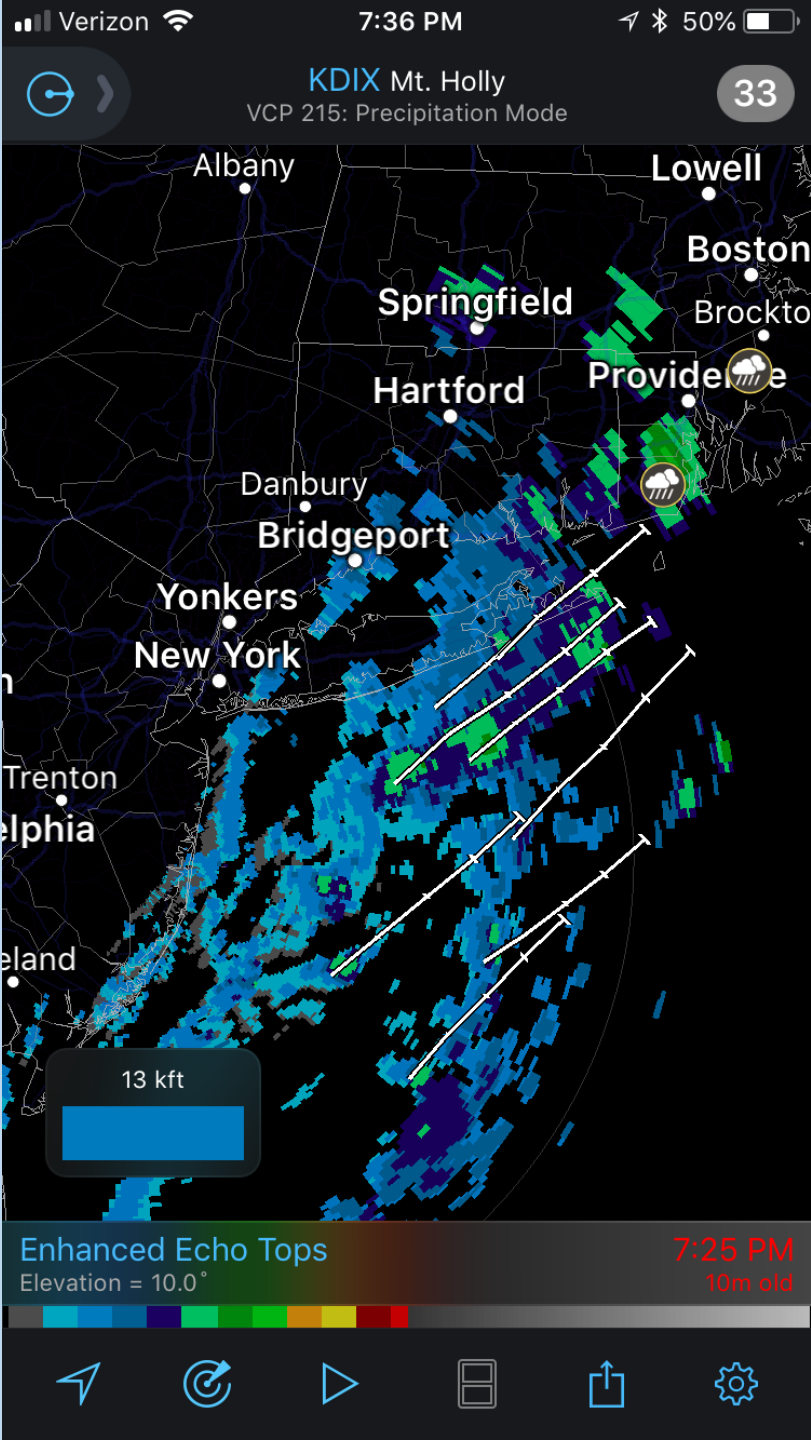
Composite Reflectivity



Composite Reflectivity

dBZ	Rain Rate (in/hr)	Rain Rate (mm/hr)
65	16+	420+
60	8.00	205
55	4.00	100
50	1.90	47
45	0.92	24
40	0.45	12
35	0.22	6
30	0.10	3
25	0.05	1
20	0.01	Trace
< 15	No rain	No rain





Echo Tops

- Echo tops can be used to assess the intensity of a storm
- A stronger updraft makes convective wind gusts and large hail more likely
- When several storms are on radar, echo tops can help indicate the more intense storms

Use Echo Tops to see if the storms are growing or decreasing in intensity

Radar Summary

Radar Maps



Current Radar



Metro Radar

Radar Summary

Region:

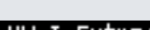
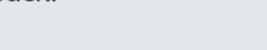
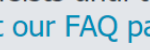
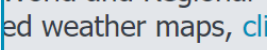
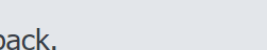
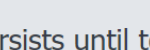
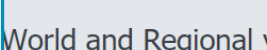
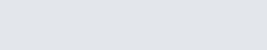
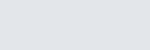
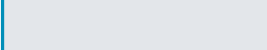
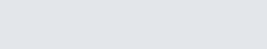
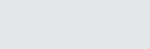
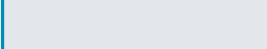
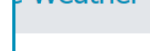
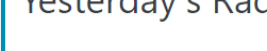
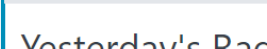
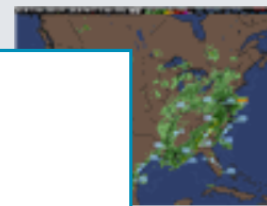
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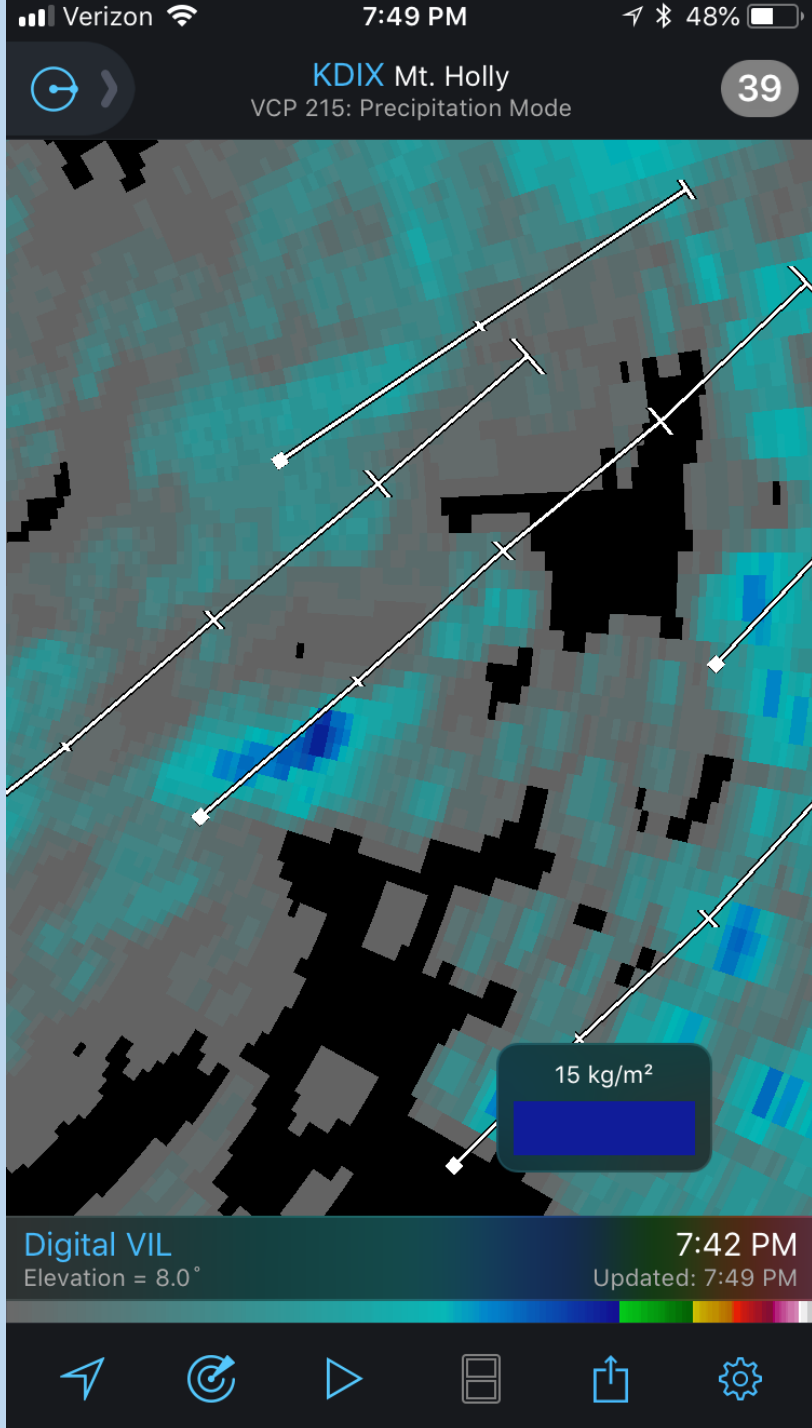
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- Current Radar
- Forecast Radar
- Radar Summary**
- Yesterday's Radar Loop
- 1Km Radar
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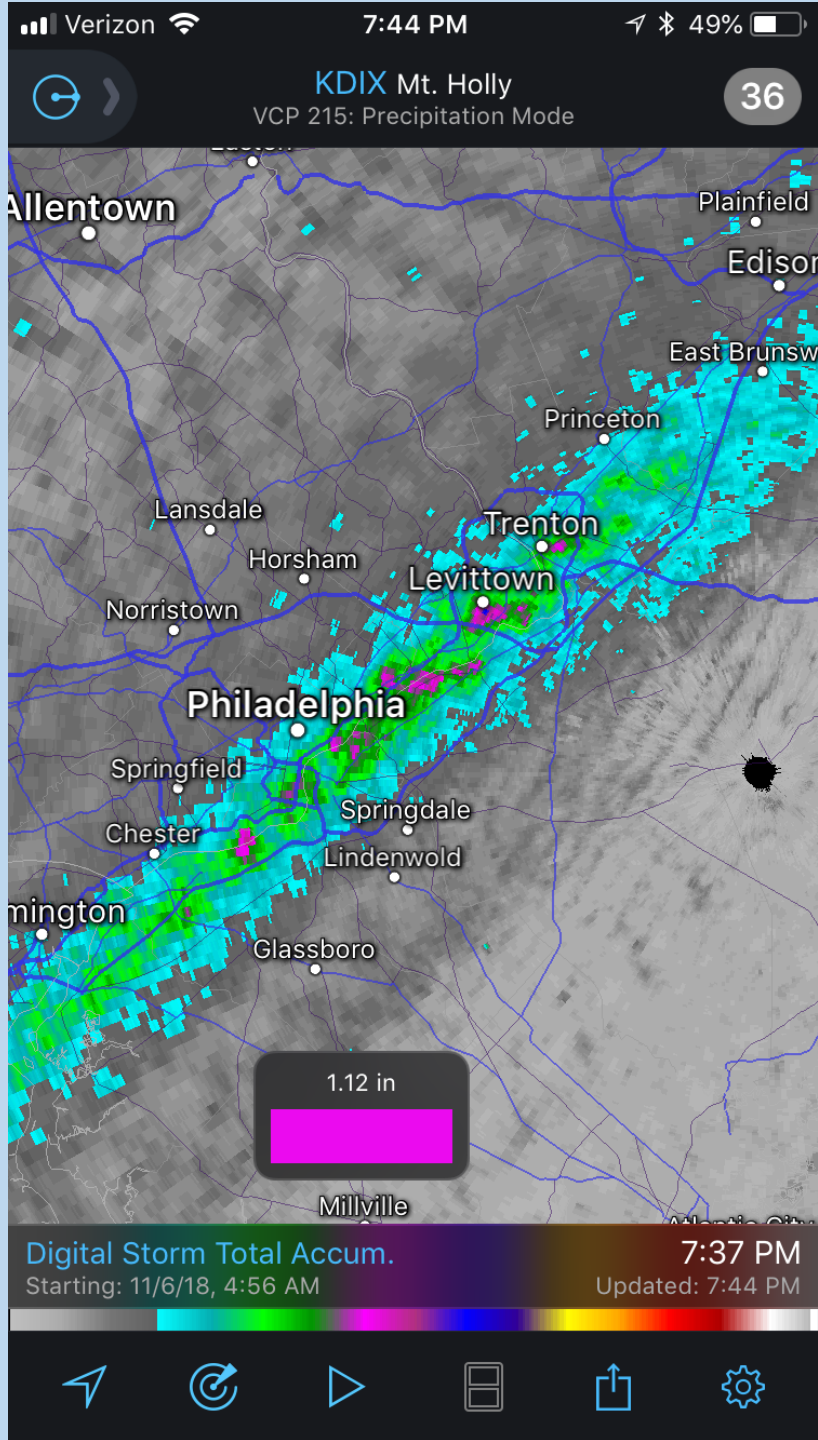


World and Regional views. View persists until toggle back.
ed weather maps, [click here to visit our FAQ page.](#)



Vertically Integrated Liquid (VIL)

- High values of VIL can be an indicator of an updraft's strength
- Taller updrafts tend to have higher values of VIL and are more likely to produce hail



Digital Storm Total Accumulation

- Determine accumulations for the duration of a storm event
- Also discrete accumulations over short time periods

Aids in nighttime tarping decisions

← Back

Full Observation



Current Location

2 Miles SW Brooklyn IL

Observation Station

ID: KSTL

Name: St. Louis Lambert International Airport

Current Conditions

Temperature: 95°F (35°C)

Weather: Hazy and Slight Breeze

Humidity: 45%

Wind Speed: W 8 MPH

Wind Gust: 12 MPH

Barometer: 28.78 in. (1001.2 mb)

Dew Point: 70°F (21°C)

Wind Chill: N/A

Heat Index: 101°F (38°C)

Visibility: 1.0 mi.



So, How Do We Make the Call?



Game day weather decisions.

Hoping for the best, preparing for the worst.

The 3 C's

- Communication
- Composure
- Confidence

Severe weather preparedness begins with a well-maintained playing surface

- Choose the right infield mix for your situation
- Know your infield conditioners and use them properly
- Maintain a consistent grade to the infield skin
- Surface drainage is key, especially during torrential downpours

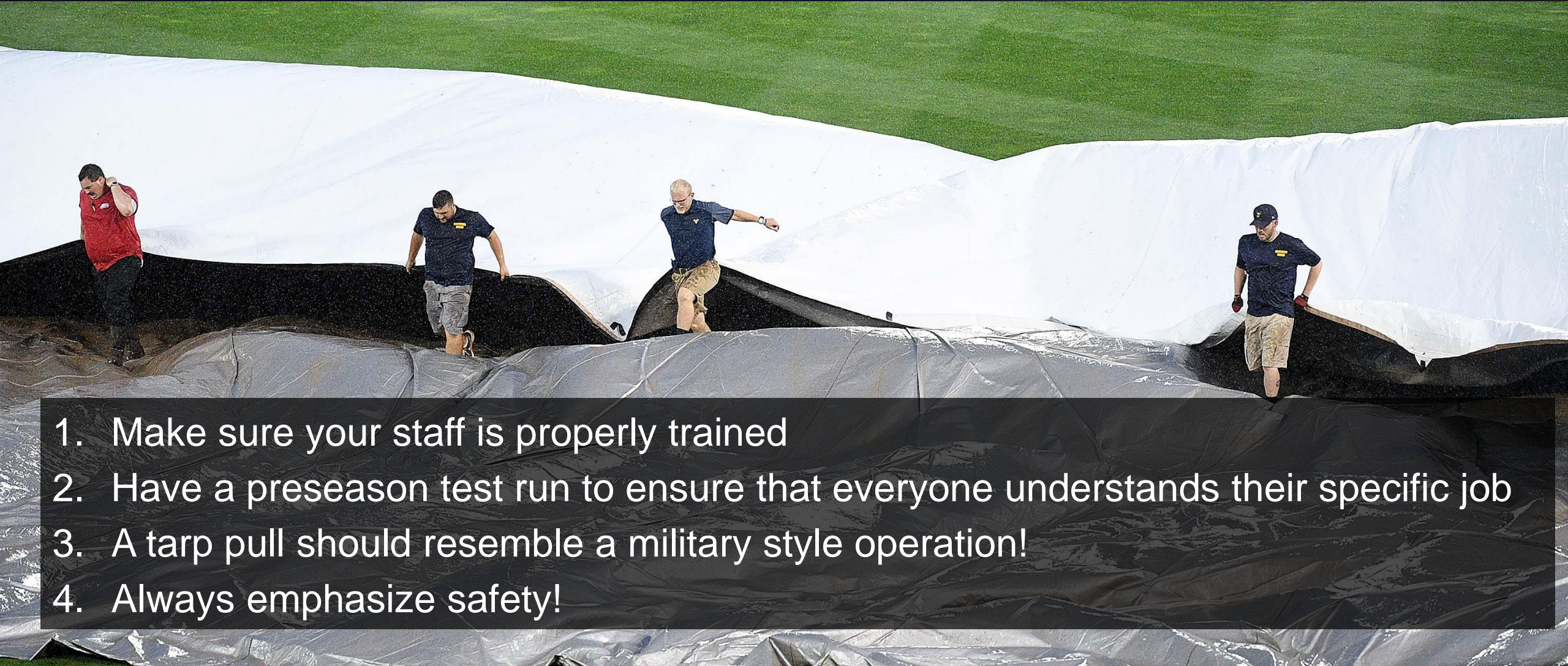


Severe weather preparedness begins with a well-maintained playing surface

- Choose the right infield mix for your situation
- Maintain a consistent grade to the infield skin
- Maintain a consistent grade to the infield skin
- Surface drainage is key, especially during torrential downpours



Staffing for the tarp



1. Make sure your staff is properly trained
2. Have a preseason test run to ensure that everyone understands their specific job
3. A tarp pull should resemble a military style operation!
4. Always emphasize safety!

What tools do I use to make the best decisions possible?

- Hourly Forecasts – **When I wake up in the morning...**
- Forecast Discussion – **Helps with timing of arrival of fronts and significant weather**
- Call a local forecaster – **more than happy to help and contribute**
- Find a radar app that you feel comfortable with – **good stuff**

While at the stadium...



Before I leave the stadium...



When I wake up in the morning...



Check the Hourly Weather Forecast



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Hazardous Weather Conditions

- [Hazardous Weather Outlook](#)

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Current conditions at West Palm Beach - Palm Beach International Airport (KPBI)

Lat: 26.69°N Lon: 80.1°W Elev: 10ft.



Partly Cloudy

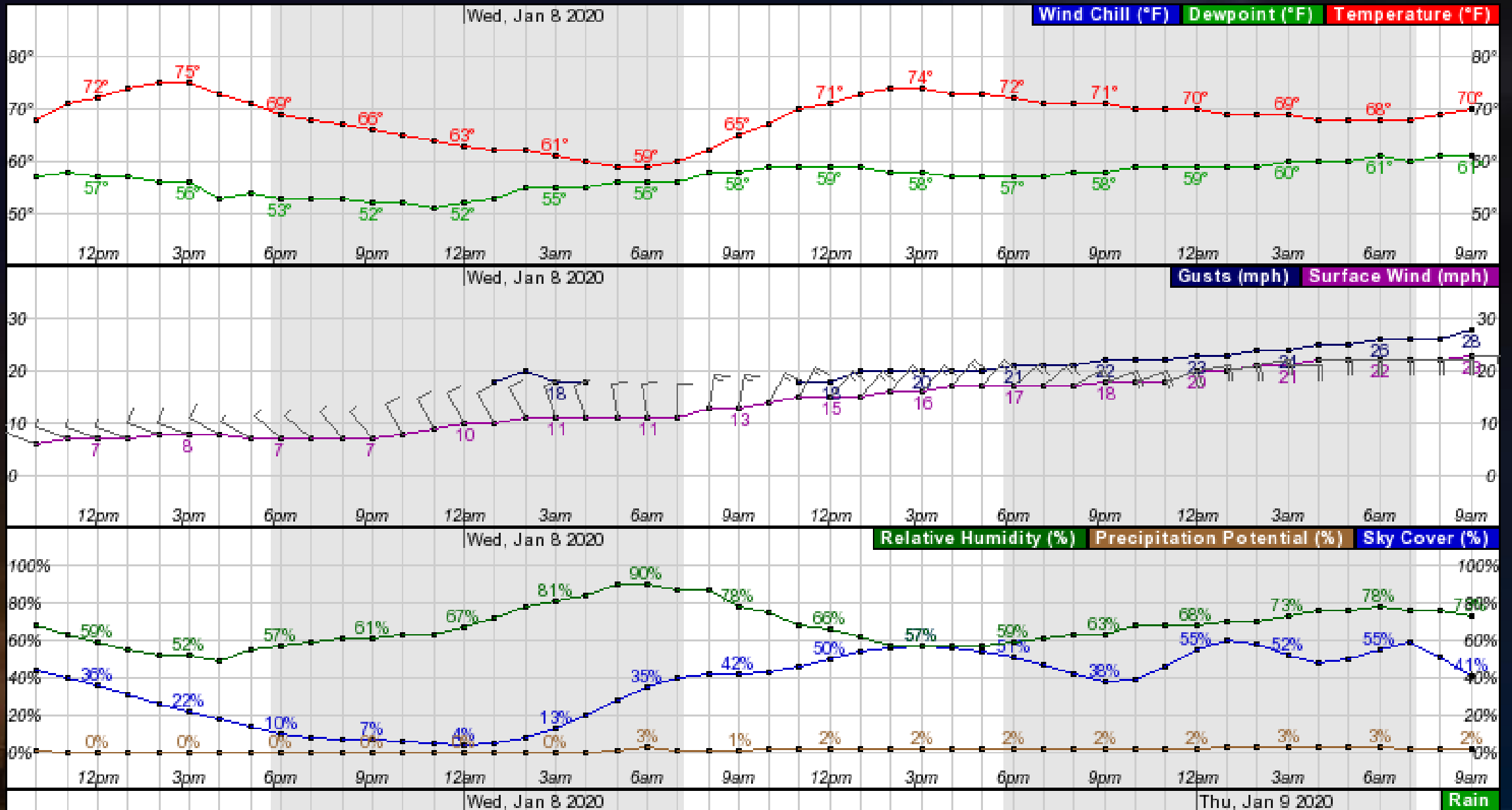
72°F
22°C

Humidity 53%
Wind Speed NW 7 mph
Barometer 30.23 in (1023.6 mb)
Dewpoint 54°F (12°C)
Visibility 10.00 mi
Last update 7 Jan 9:53 am EST

More Information:
[Local Forecast Office](#)
[More Local Wx](#)
[3 Day History](#)
[Mobile Weather](#)
[Hourly Weather Forecast](#)

Extended Forecast for 2 Miles NNW Palm Beach FL

Check the Hourly Weather Forecast



Check the Forecast Discussion



National Weather Service Weather Forecast Office

Miami - South Florida

weather.gov



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National Weather Service Miami FL

938 AM EST Tue Jan 7 2020

.Update...

Surface high pressure centered over Central Florida early this morning will shift south today as a cold [front](#) moves into North Florida. The high pressure shifting south into our region will lead to a slight reinforcement of dry air this afternoon, therefore skies should remain [mostly sunny](#) today with last night's cloudiness moving east over the Atlantic and western Bahamas.

Temperatures, wind, and dewpoints all look on track today, and all areas will have high temps in the mid to upper 70s with lowest relative [humidity](#) values at or below 50 percent.

Call Your Local Forecaster



National Weather Service
State College, PA Weather Forecast Office
328 Innovation Blvd, Suite 330
State College, PA 16803
(814)231-2408

Page Author: CTP Webmaster

Web Master's E-mail: ctp.webmaster@noaa.gov

Page last modified: Dec 5th, 2019 03:55 UTC

Develop a plan of action

When I am at the Stadium

1. Pull up the radar to make sure that nothing sneaks in the morning
2. Hourly forecasts
3. Forecast discussion

Then...



Develop a plan of action
When I am at the Stadium

4. Call the GM to let him know we will need the labor to potentially pull the tarp
 - a. Give the GM your best interpretation of when the labor is needed
 - b. The Front office is our tarp crew and they can schedule accordingly

Develop a plan of action
When I am at the Stadium

5. Talk with the Crew – if we have a rain at 2pm we need to expedite everything prior to the potential weather event

May need to prioritize certain tasks

- a. Mowing infield grass
- b. Prepping pitcher's mound and home plate
- c. Line the infield

Develop a plan of action

For when it's 30 minutes prior to game time

1. Call the GM for a discussion
2. Call the NWS
 - Timing of the storm
 - Duration of the rain
 - Wind
 - Severe threats
 - Lightning
3. Talk with both team Managers
 - Relay information
4. Talk with the Umpires
 - Before the lineups are exchanged



Develop a plan of action **OR Decide to Start the Game**

Chance to get 3 innings in we usually go for it
(normally about 45-minute window)

If the sun is blasting,
we will start the game

Many factors to consider:

- Obligation to the Parent Club
- Obligation to the Fans
- Safety vs. Obligations



Facility Severe Weather/Lightning Policy

Does your facility have one?

NCAA policy

“Requires that play be suspended if there is lightning within 8 miles of the stadium.”

MLB/MiLB policy

“Once the lineup cards are exchanged, the umpire-in-chief shall have sole authority when a game shall be called, suspended or resumed on account of weather.”

“Nothing in this rule is intended to affect a club’s ability to suspend or resume any game pursuant to a policy governing severe weather, significant weather threats, and lightning safety that has been filed with the league office prior to the season”

Time for Discussion!



THANK YOU!!

Matt Neri

mneri@statecollegespikes.com

Brad Jakubowski

brj8@psu.edu



Weather Safety for Outdoor Activities

Suspension and resumption of outdoor activities should be planned in advance

SAFE evacuation plans include locating:

1. Fully enclosed metal vehicles with windows up
2. Substantial buildings with pipe-in plumbing
3. The low ground. Seek cover in clumps of bushes
4. Ingress and Egress Routes

Weather Safety for Outdoor Activities

A responsible person should be designated to monitor weather conditions

- Weather Apps
- NOAA Weather Radio
- Local weather forecasts should be observed 24 hours prior
- An inexpensive portable weather radio is recommended for obtaining timely storm data

MLB/MILB Weather and Lightning Policy

(e) As soon as the home team's batting order is handed to the umpire-in-chief the umpires are in charge of the playing field and from that moment the umpire-in-chief shall have sole authority to determine when a game shall be called, suspended or resumed on account of weather or the condition of the playing field. The umpire-in-chief shall not call the game until at least 30 minutes after he has suspended play. The umpire-in-chief may continue the suspension so long as he believes there is any chance to resume play. Nothing in this Rule is intended to affect a Club's ability to suspend or resume any game pursuant to a policy governing severe weather, significant weather threats, and lightning safety that has been filed with the league office prior to the championship season.