Advanced Spotter Training

National Weather Service
North Platte, NE

Today's Topics

- Brief Review of last year's season
- Forecasting Severe Weather
- Tornadogenesis & Advanced Radar Interpretation
- A look at the Almeria Storm
- Spotting, Reporting, and Safety

2017 Nebraska Tornadoes

Total: 33 (average: 42)

EF-0:	13	Apr:	2
EF-1:	14	May:	4
EF-2:	4	Jun:	19
EF-3:	0	Jul:	0
EF-4:	0	Aug:	7
EF-5:	0	Sep:	0
Unk.	2	Oct:	1

Bellevue (EF-2), June 16
Photo: NWS Omaha damage survey

Western Nebraska Tornadoes

Total: 10

By county:

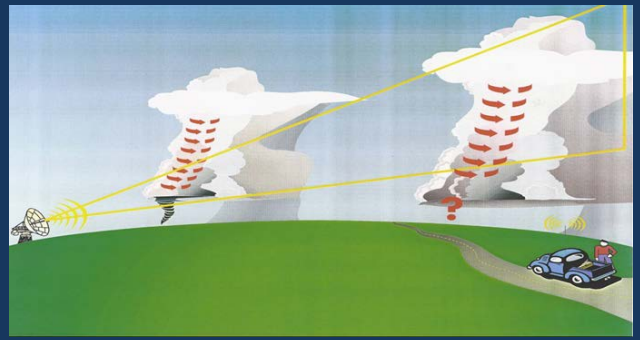
Loup	5
Sheridan	3
Chase	1
Perkins	1

Near Almeria/Taylor (EF-2), Aug. 19

Photo credit: Janet Sanders

The Role of the Spotter

- Provide “ground truth”
  - Radar has its limitations
- Reports strengthen warning credibility
  - “Radar-indicated” vs. “Observed”



Advanced Spotter Tidbit:

Recent research has shown that often tornadic circulations start at the ground and can be seen long before a condensation funnel!

There is no Radar out there that can sample the ground for this circulation – only our spotters can see it!

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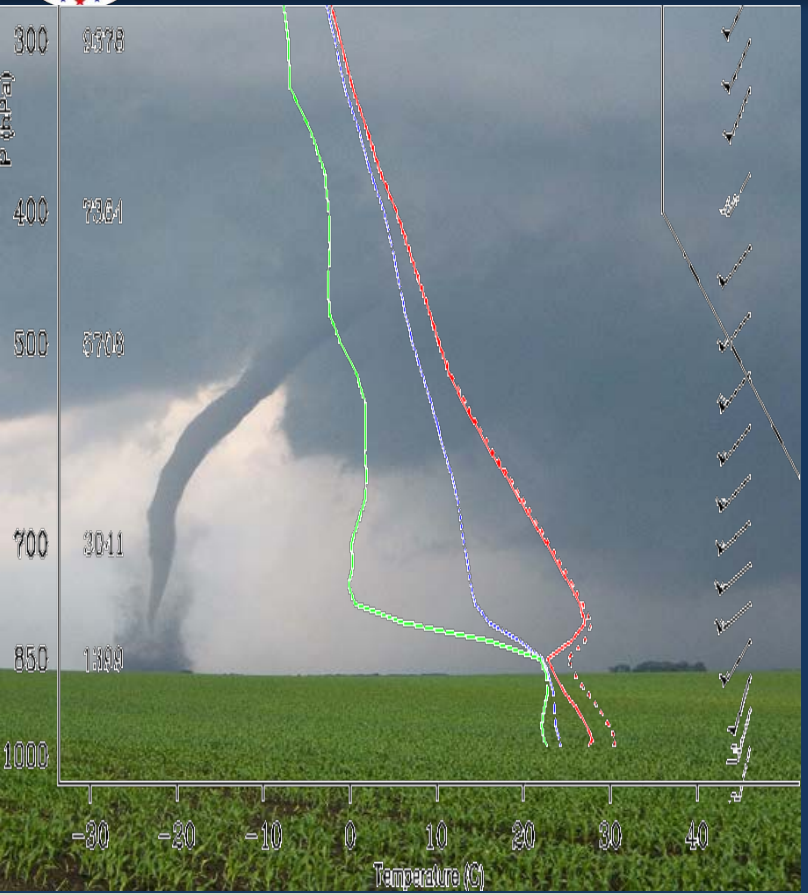
Forecasting Severe Weather

www.nssl.noaa.gov/education/svrwx101

Tornado Basics

- What distinguishes a “tornado day” from a regular thunderstorm day?
  - Thunderstorms need:
    - Moisture
    - Instability
    - A Source of Lift
    - Spin in the Atmosphere (Wind Shear)

Tornado Basics

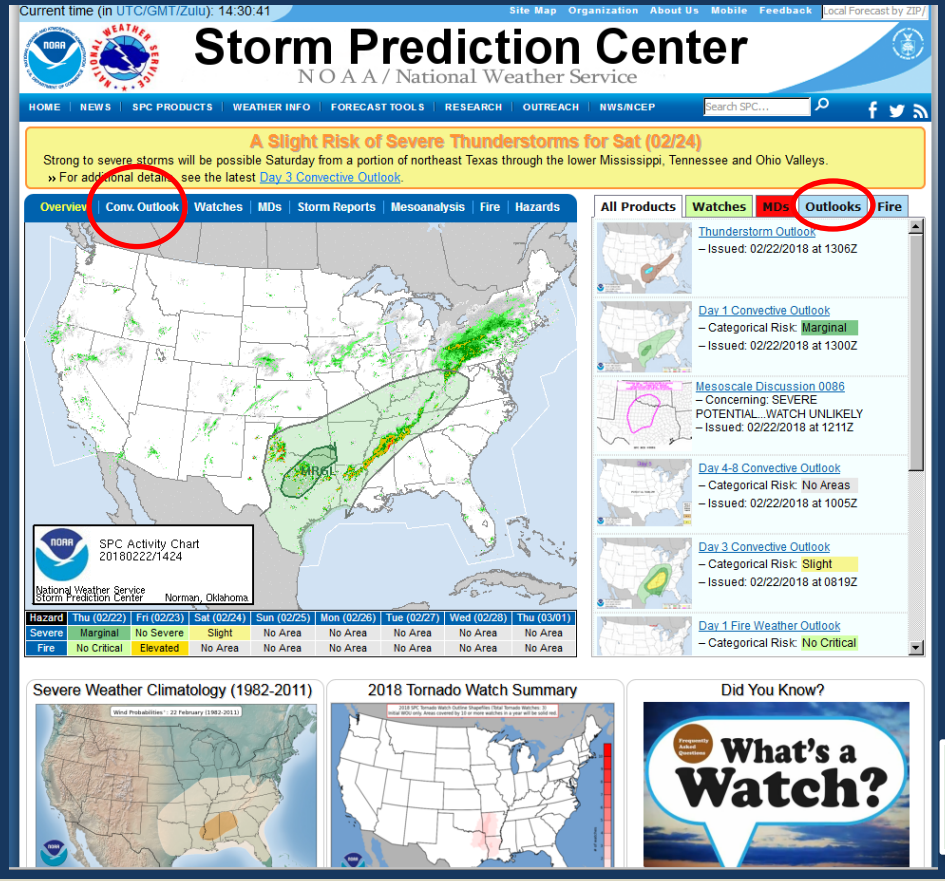


- Warm, humid air at the surface, usually a South wind
- Cooler air and strong west/southwest winds aloft
- The Temp diff and changes in wind speed and direction create instability and wind shear
- Usually a layer of warmer, dry air called a “cap” separates the two layers (the “loaded gun”). When it breaks, storms develop suddenly
- A boundary to kick things off

Forecasting Tornadoes

- Meteorologists at the Storm Prediction Center (SPC) issue daily forecasts, or convective outlooks, for organized severe thunderstorms.

SPC – A Good Place To Start



www.spc.noaa.gov

Outlooks Tab

- Convective Outlook
- Probabilistic Graphics
  - Categorical
  - Tornado
  - Hail
  - Wind
- Discussion

Nerd Scale

Motor cycle — Pocket Protector

SPC – A Good Place To Start

VALID 1618Z - 1712Z

...THERE IS A MDT RISK OF SVR TSTMS FROM SERN SD AND PARTS OF ERN NEB THROUGH SRN MN...NRN/CNTRL IA INTO SWRN WI...

...THERE IS A SLGT RISK OF SVR TSTMS FROM PARTS OF THE NRN AND CNTRL PLAINS INTO UPPER MIDWEST...

...SUMMARY...
SEVERE THUNDERSTORMS CAPABLE OF POTENTIALLY WIDESPREAD DAMAGING WIND...VERY LARGE HAIL AND TORNADOES...A COUPLE OF WHICH COULD BE SIGNIFICANT...WILL OCCUR TODAY INTO TONIGHT FROM PARTS OF SOUTHEAST SOUTH DAKOTA AND CENTRAL AND EASTERN NEBRASKA EASTWARD ACROSS MUCH OF IOWA...SOUTHERN MINNESOTA...INTO WISCONSIN.

...SYNOPSIS...

A TROUGH OVER THE WRN U.S. WILL INTENSIFY DURING THE DAY ONE PERIOD IN RESPONSE TO THE EQUATORWARD PROGRESSION OF MID AND UPPER-LEVEL JET STREAKS FROM THE FAR NERN PACIFIC INTO THE TROUGH BASE OVER THE GREAT BASIN. DOWNSTREAM FROM THESE DEVELOPMENTS...MORNING WATER VAPOR IMAGERY INDICATES A LOW-AMPLITUDE SHORT-WAVE TROUGH PROGRESSING INTO THE NRN AND CNTRL PLAINS WITH THIS FEATURE CONTINUING ENEWD INTO THE UPPER GREAT LAKES BY LATE TONIGHT/EARLY TUESDAY.

AT THE SURFACE...A LEE CYCLONE OVER WRN SD WILL DEVELOP EWD ALONG A NWD-MOVING WARM FRONT INTO CNTRL MN BY 17/00Z BEFORE REACHING NRN WI BY 17/12Z. MEANWHILE...SECONDARY LOW PRESSURE OVER NERN CO WILL DEVELOP INTO SWRN NEB WHILE A DRYLINE SLOWLY MIXES EWD OVER THE CNTRL AND SRN HIGH PLAINS.

...NRN/CNTRL PLAINS INTO UPPER MIDWEST TODAY THROUGH TONIGHT...

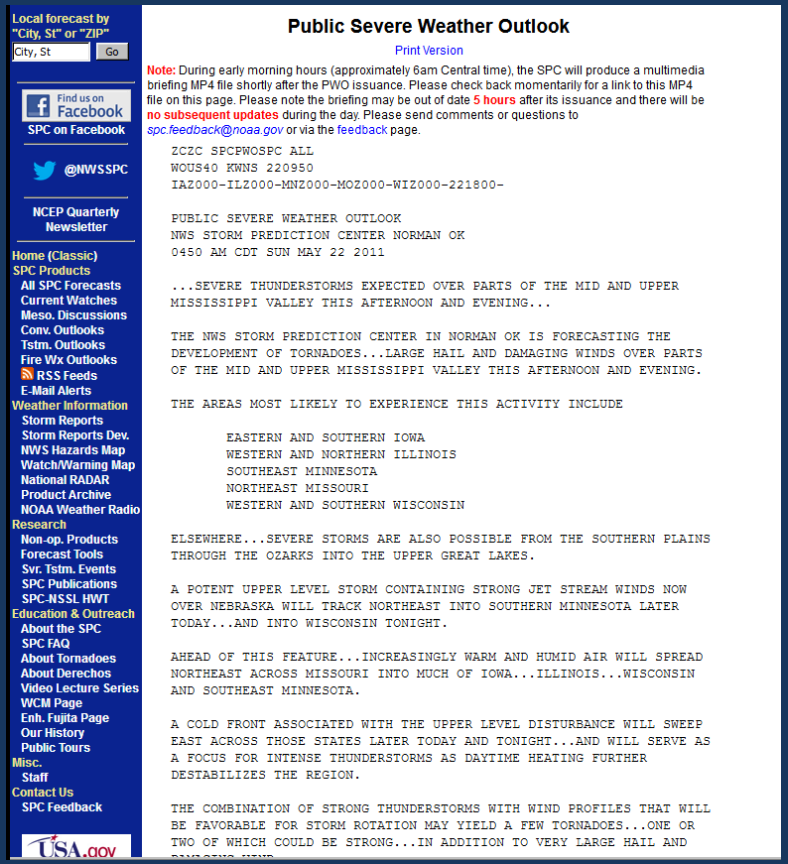
12Z OBSERVED SOUNDINGS FROM LBF...DDC...AND TOP SHOWED A VERY MOIST BOUNDARY LAYER WITH LOWEST-100-MB MEAN-MIXING RATIOS OF 14-15 G PER KG SURMOUNTED BY 700-500-MB LAPSE RATES OF 8-9 C/KM. DIFFERENTIAL ADVECTIONS ASSOCIATED WITH A NEWD-MIGRATING 40-50 KT LLJ AND STRENGTHENING SWLY FLOW IN THE 700-500-MB LAYER WILL RESULT IN THE DEVELOPMENT OF A SIMILAR THERMODYNAMIC STRATIFICATION INTO THE MID

Discussion

- Can be very technical
- Look at the summary, synopsis, and anything under the header “NRN/CNTRL Plains”

Nerd Scale

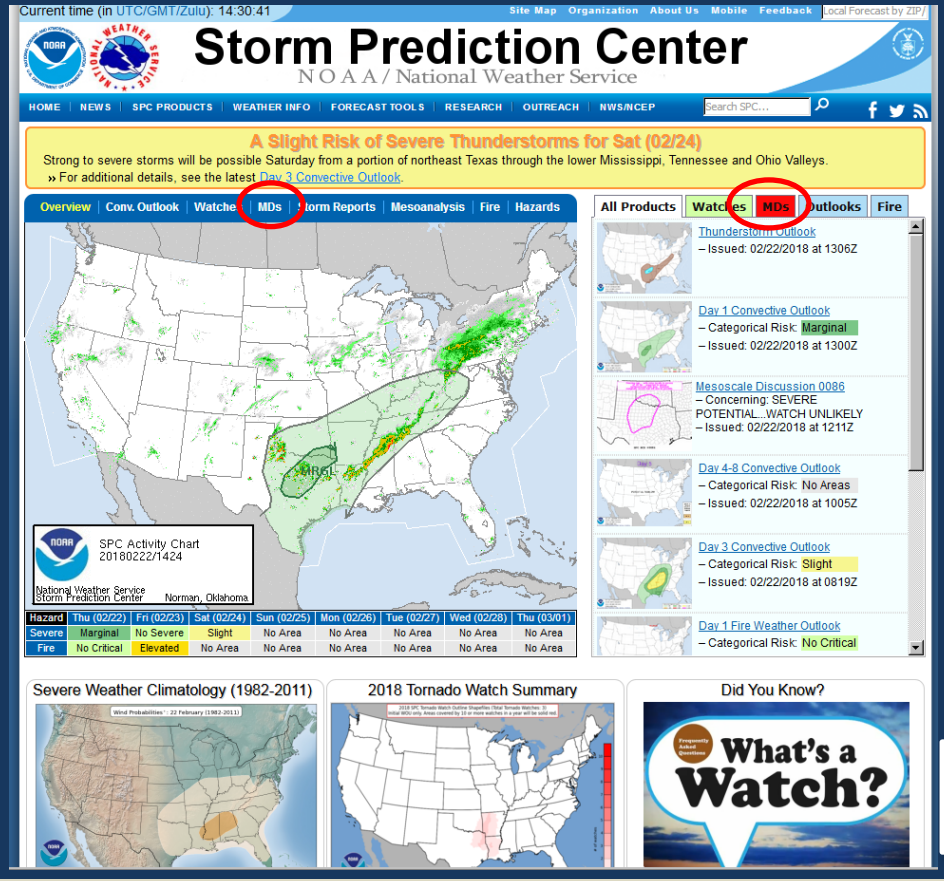
SPC – A Good Place To Start



Public Weather Outlook (PWO)

- More user friendly (i.e. It's in English)
- More similar to an Area Forecast Discussion from a Forecast Office
- Usually linked at the top of the Day 1 Outlook page and on the SPC home page

SPC – A Good Place To Start



www.spc.noaa.gov

MDs = Mesoscale Discussions

- Technical
- Usually precedes a watch
- Circles the area of interest

Nerd Scale

Motorcycle

Discussion Key Words

- Moisture
  - "Dewpoint > X"
    - Generally, 50˚ = Okay 60˚ = Good 70˚ = High
  - "Dewpoint Depression < 15˚F/9˚C"
    - closer it is to zero, the more moisture/fuel there is
  - "Precipitable Water"
    - 0.50 to 1.25 inches = low moisture content
    - 1.25 to 1.75 inches = moderate moisture content
    - 1.75 to 2.00 inches = high moisture content
    - 2.00 inches or above = very high moisture content

Discussion Key Words

- Instability
  - "Lapse Rates"
    - Greater than 6.5˚C/km (minimum) at mid levels 2-6km
    - Greater than 8 ˚C/km better
  - "Convective Available Potential Energy (CAPE)"
    - CAPE of 1,500 J/kg = very unstable, > 2,500 J/kg extremely unstable
  - "Lifted Index (LI)"
    - Less than -4 (large) less than -7 (extreme)

Discussion Key Words

- Lift
  - "Front / Boundary"
    - Storms should be along a boundary or on the "warm side" of a front
    - Dryline
  - "Forcing for Ascent"
  - "Negatively Tilted Trough"
  - "Short Wave Trough"
  - "Jet Streak"

Discussion Key Words

- Spin
  - "Shear / BRNSHR"
    - Sfc-6km Shear > 35kt favorable, > 45kt very favorable
    - Sfc-1km Shear > 20kt very favorable for tornadoes
    - BRN Shear > 35m2/s2 favorable for supercells
  - "Helicity"
    - 0-1km (m2/s2) >100 favorable, >150 very favorable
    - 0-3km >250 is favorable
  - "Storm Relative Wind"
    - 0-2km represents low level storm inflow (>15kt favorable)

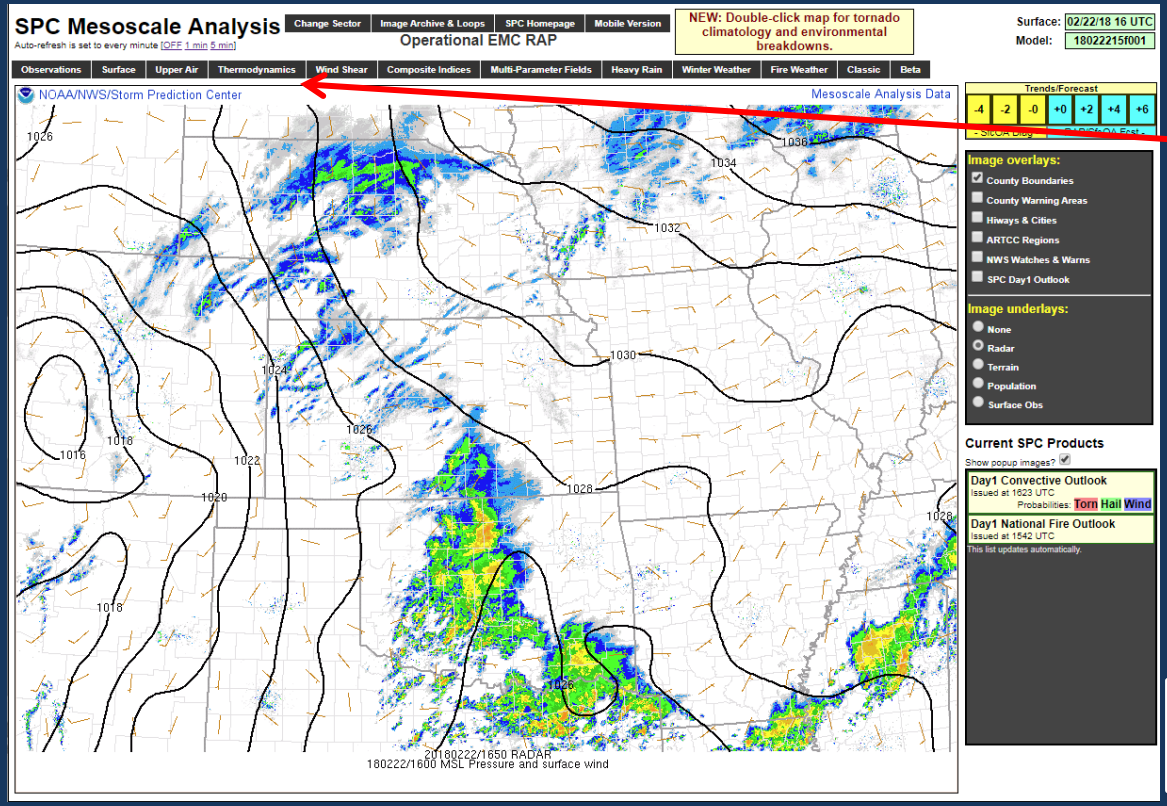
Discussion Key Words

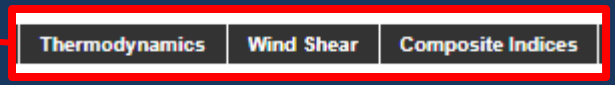
- Combination Indicies
  - "Sig Tor Parameter" A multiple ingredient, composite index that takes a look at vertical shear, instability, and other ingredients/indicies that are traditionally used to forecast significant (EF2 or greater) tornadoes. A majority of significant tornadoes have been associated with tornadoes greater than 1.
    - >1.0 Favorable
    - > 3.0 Very Favorable
  - "Supercell Composite Parameter" It was developed with the intent that any value greater than 1 or 2 would indicate a risk for updraft rotation. This is comprised primarily of shear and instability inputs.
    - > 1.0 Favorable
    - > 2.0 Very Favorable

Discussion Key Words

- Other Indicies and Terms
  - "Lifting Condensation Level (LCL)" the height at which an air parcel will become saturated when it is lifted and cooled. This is a reasonable estimate of where the cloud bases will be.
    - 3,200ft – 5,000ft (1000-1500m) favorable
    - < 3,200ft (1000m) very favorable
  - "Low Level Jet (LLJ)" a ribbon of stronger winds that forms, usually later in the day. Can increase moisture supply and shear.

Where to Find This Information





Nerd Scale

http://www.spc.noaa.gov/exper/mesoanalysis/

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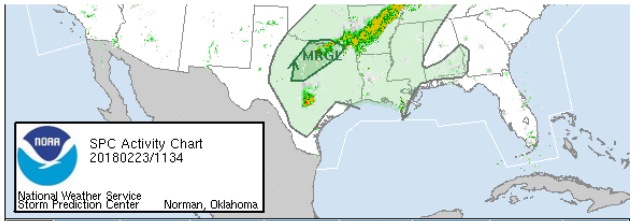
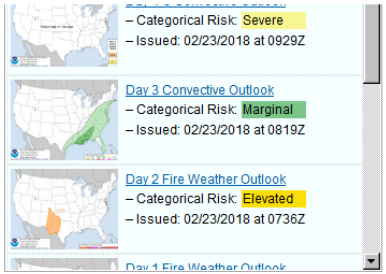
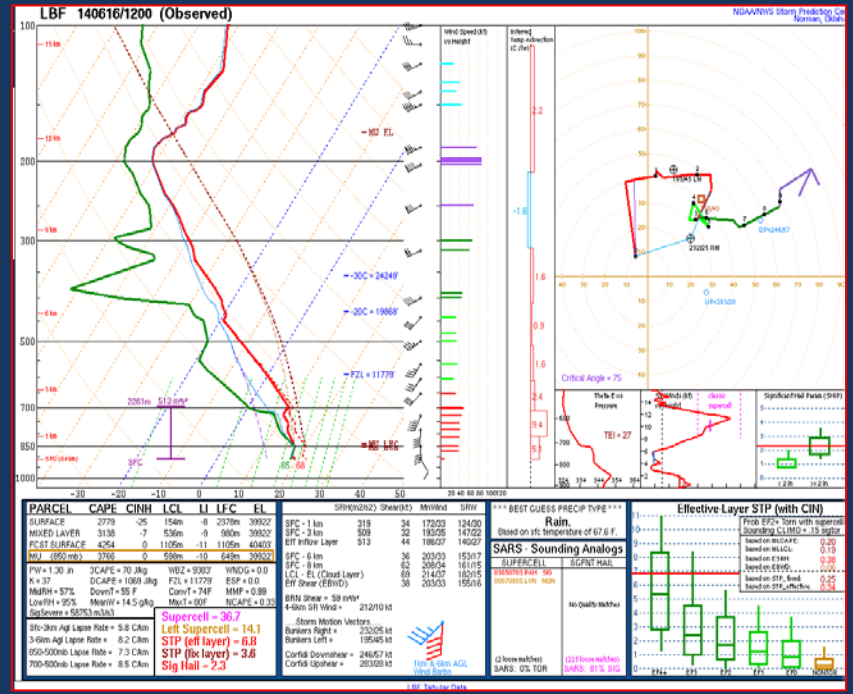
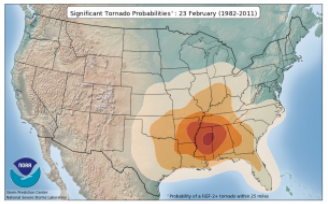


Hazard	Fri (02/23)	Sat (02/24)	Sun (02/25)	Mon (02/26)	Tue (02/27)	Wed (02/28)	Thu (03/01)	Fri (03/02)
Severe	Marginal	Enhanced	Marginal	No Area	No Area	Severe	No Area	No Area
Fire	Elevated	Elevated	No Area	No Area	No Area	No Area	No Area	No Area





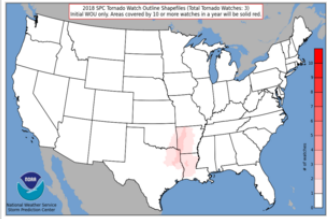
Severe Weather Climatology (1982-2011)



Significant Tornado Probabilities: 23 Feb

More severe weather climatology data here.

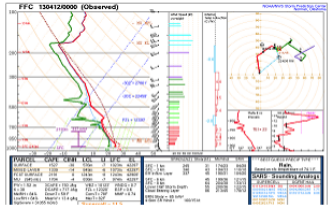
2018 Tornado Watch Summary



Did You Know?

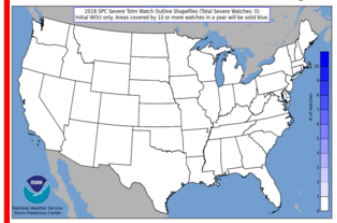
What's My Risk?

Forecast Tools



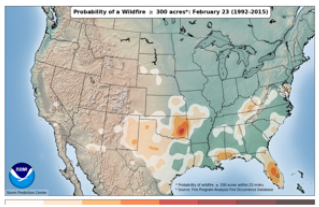
Observed Soundings

2018 Severe Tstm Watch Summary



Page last modified: February 23 2018 12:15 UTC

Wildfire Climatology (1992-2015)

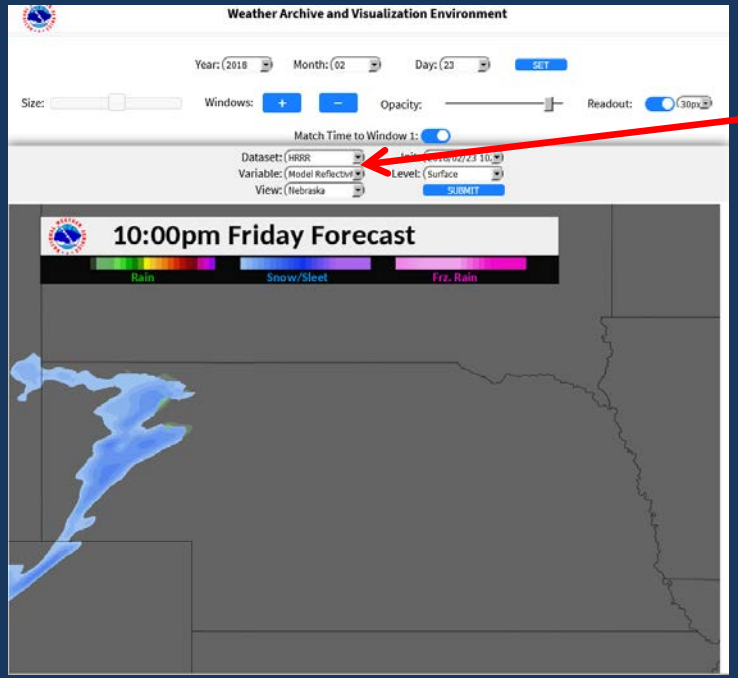


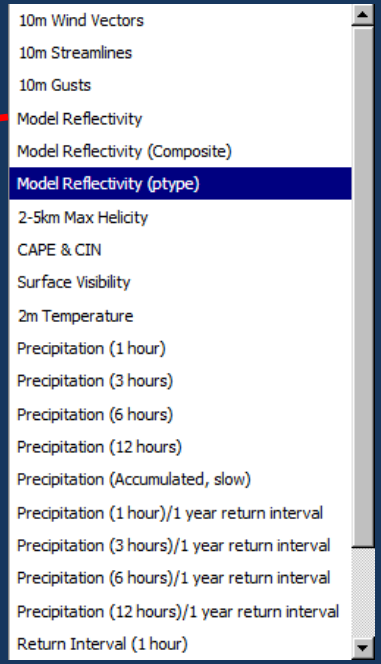
300 Acres Wildfire Probabilities: 23 Feb

Nerd Scale

Forecasting Tools on the Web

- Weather Archive and Visualization Environment (WAVE)
  http://ssd2.wrh.noaa.gov/WAVE/index_bill.php





"Dataset" = Which model?

For thunderstorms, choose:
HRRR
RAP
ARW
NAM (3km)

Nerd Scale

Forecasting Tools on the Web

- Pivotal Weather
  http://www.pivotalweather.com/model.php

- College of DuPage
  http://weather.cod.edu/forecast/

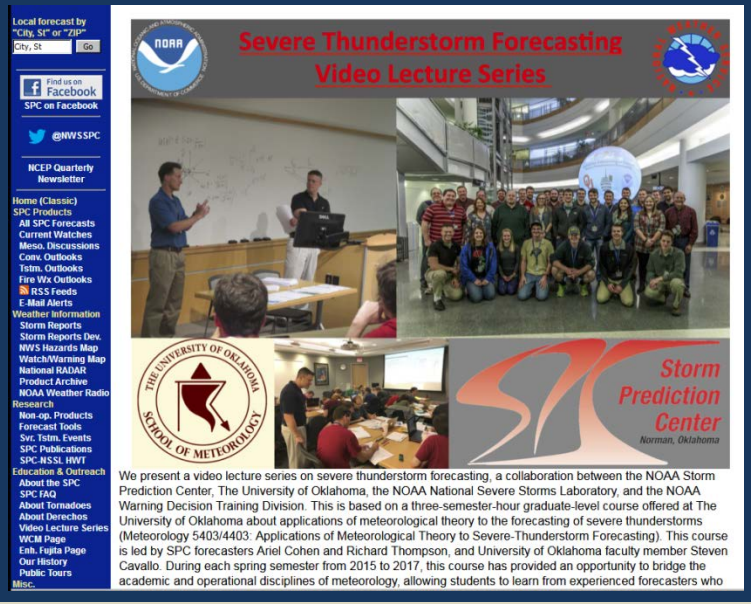
- CIRA GOES-16 Satellite Data Viewer
  http://col.st/KTbBr

References on the Web

- Severe Weather Indicies
  https://www.weather.gov/media/lmk/soo/SvrWx_Fcstg_TipSheet.pdf
- Skew-T Tutorial
  http://www.weather.gov/source/zhu/ZHU_Training_Page/convective_parameters/skewt/skewtinfo.html
- Comprehensive Severe Weather Forecast Checklist
  https://www.weather.gov/media/sgf/research/severe_weather_checklist.pdf

References on the Web

- SPC's Severe Thunderstorm Forecasting Video Series (Advanced)
  http://www.spc.noaa.gov/exper/spcousom/



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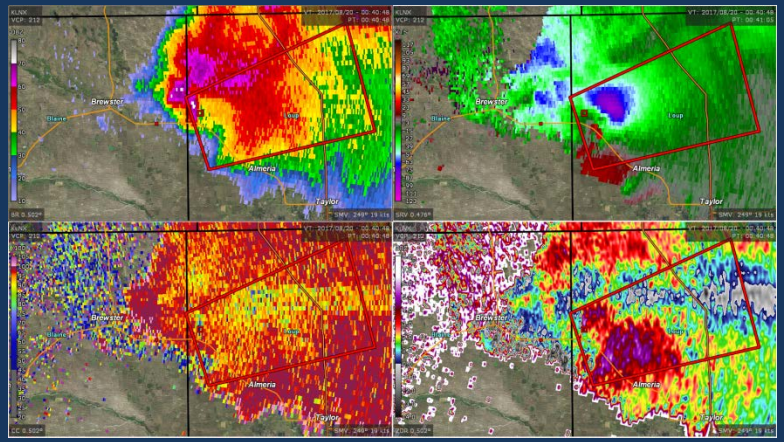
Tornadogenesis: Things we know

- Not all thunderstorms produce tornadoes
- Supercell storms have a better chance of producing tornadoes
  - But…not all supercells produce tornadoes



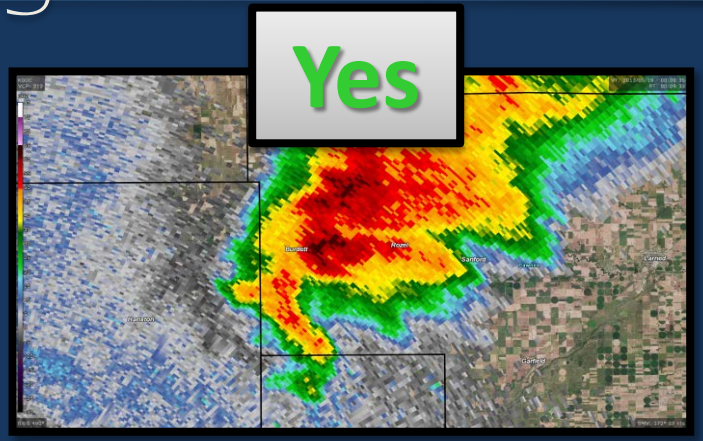
- A hook echo does not guarantee a tornado
  But it does indicate a rotating updraft

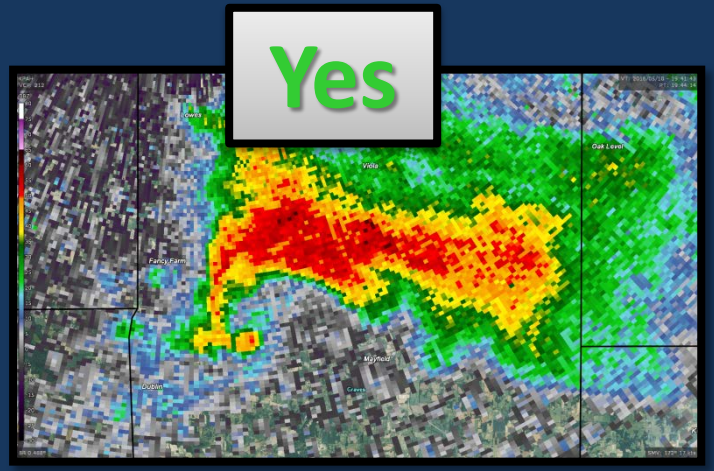
Tornadogenesis: Things we know

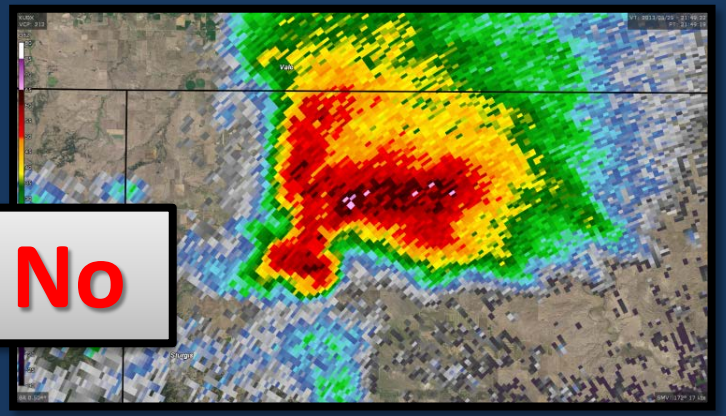
- Unless you are very close to the radar (within 5-15 miles) the circulation that may show up on radar is Not the tornado
  - Represents the “tornado cyclone” which is the parent low-level circulation
  - In most cases (> 30 miles from the radar) you are seeing the low-level mesocyclone

Tornadogenesis: Things we know

- Very similar looking supercells may not all produce tornadoes

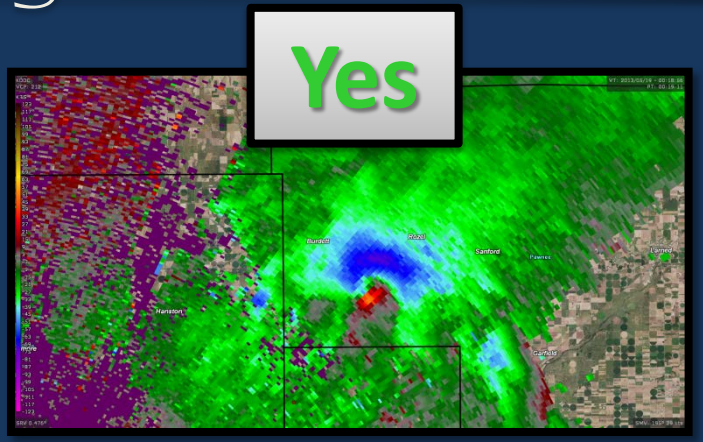


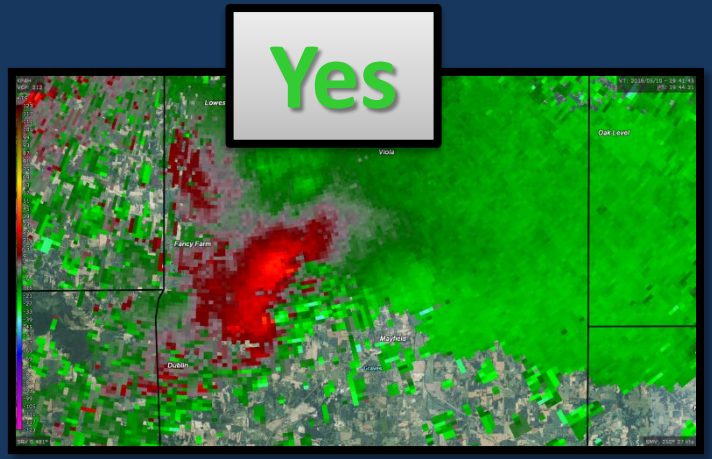


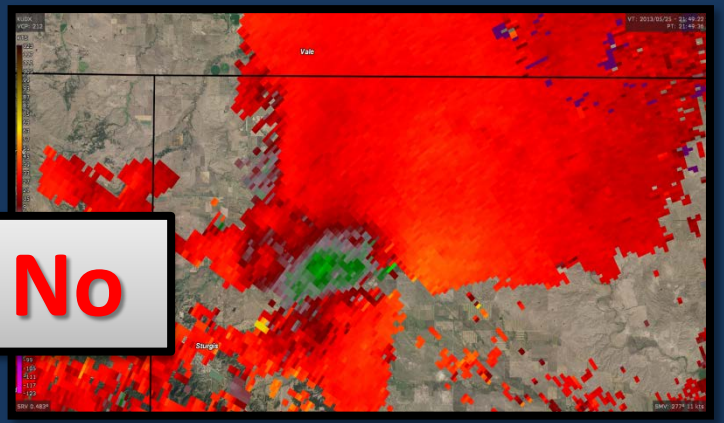


Tornadogenesis: Things we know

- Very similar looking supercells may not all produce tornadoes





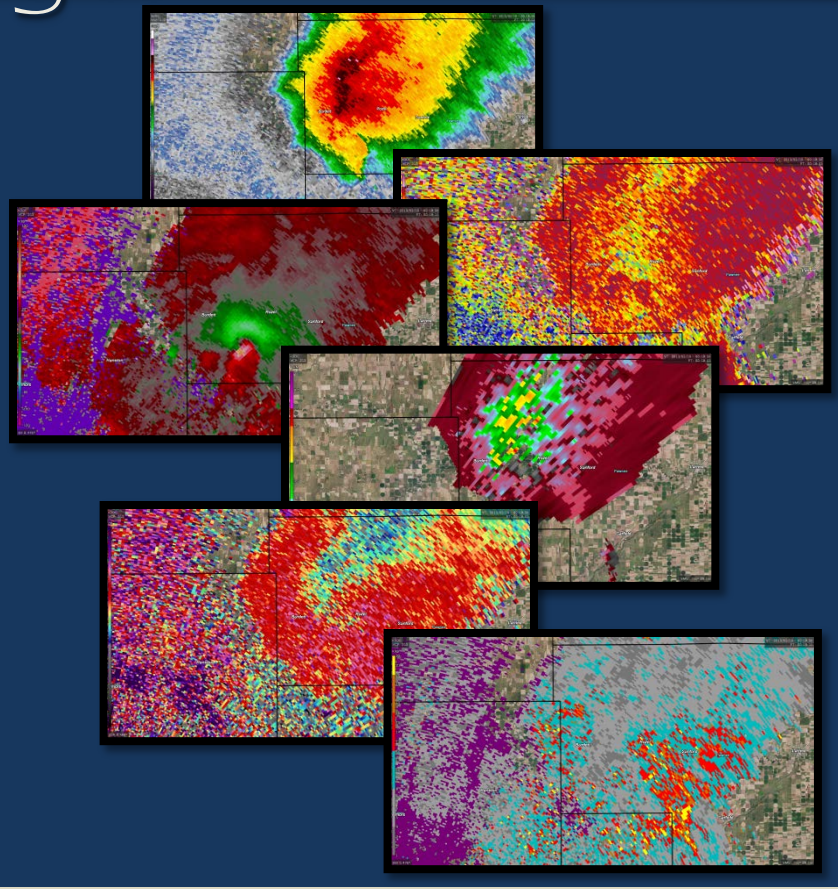


Why didn't they all produce a tornado?

- All supercells have rotation
- However a very specific cascade of events HAS to occur to generate tornadic scale rotation at the ground
- There is more to understanding radar than a "velocity couplet"

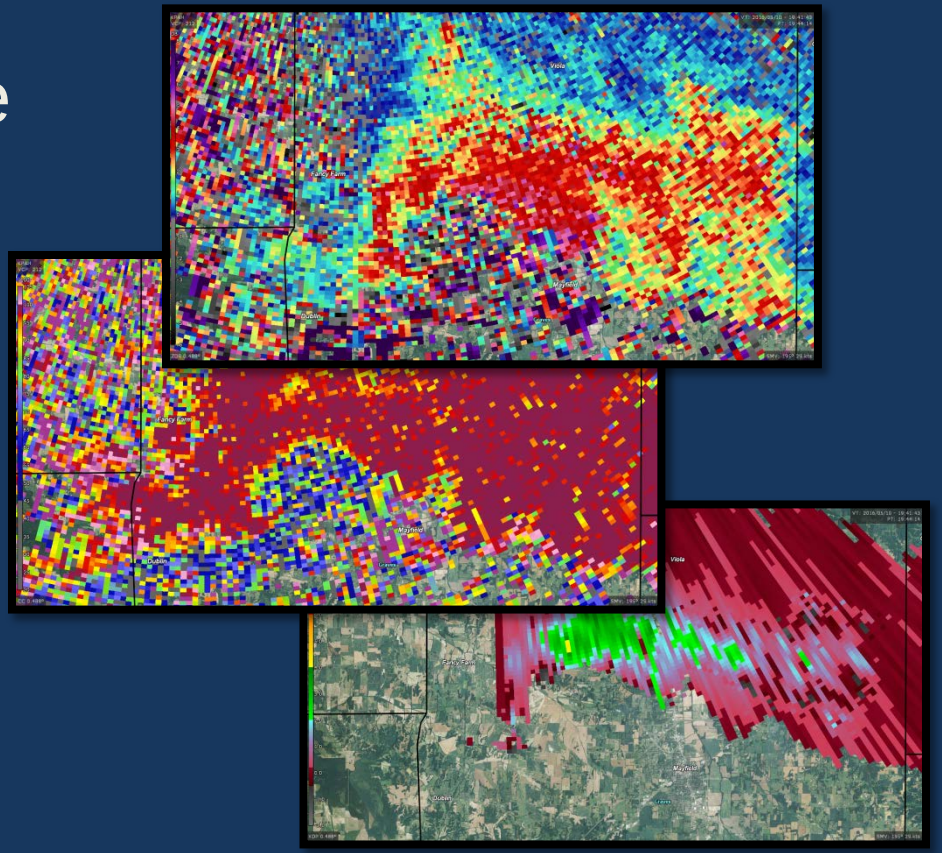
Challenges

- In supercells, a downdraft is needed to generate tornadic scale rotation at the ground
  - Downdrafts are not detected by the radar, but are rather inferred from looking at many levels and many different radar products
    - Radar images by themselves are only snapshots in 2D at a specific time



Challenges

- Downdrafts must not be too “cold” otherwise tornado processes won’t be successful
  - Radar does not include temperature data
  - How can we know?
    - **Dual Pol technology**

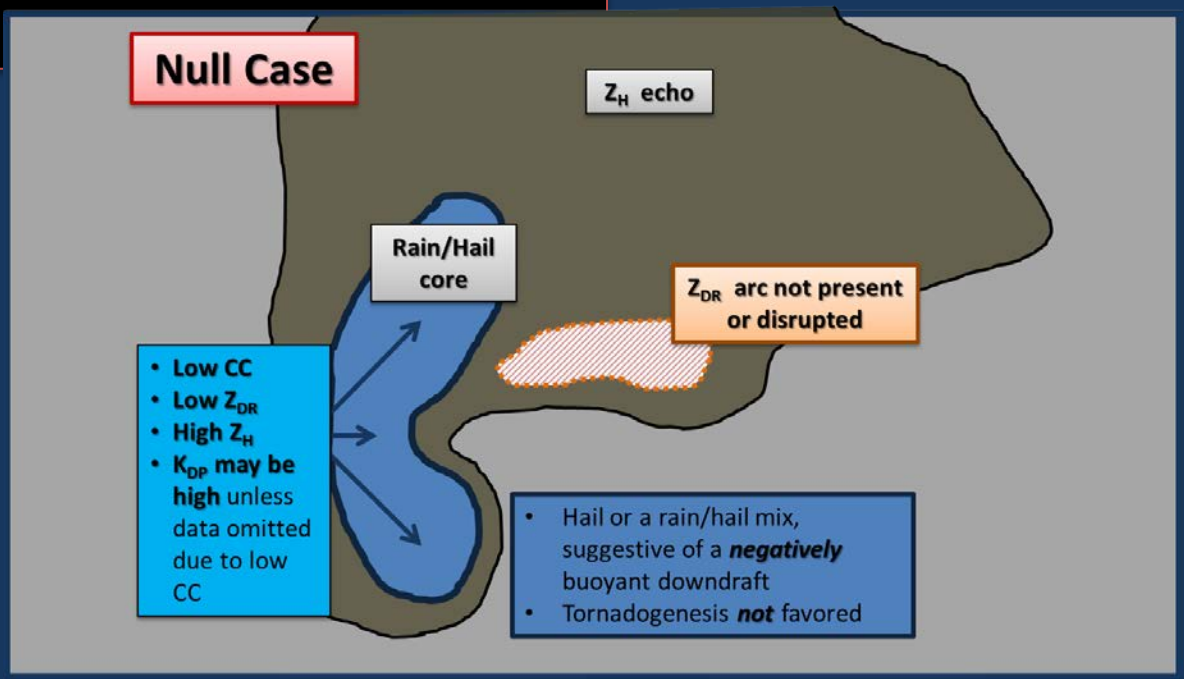


More things we know:

- Cold downdrafts in a supercell are not favorable for tornadogenesis
- Portions of the storm that contain a lot of hail or rain/hail mixed will likely generate a cold downdraft
- **Dual Pol technology can help us determine whether hail is present**

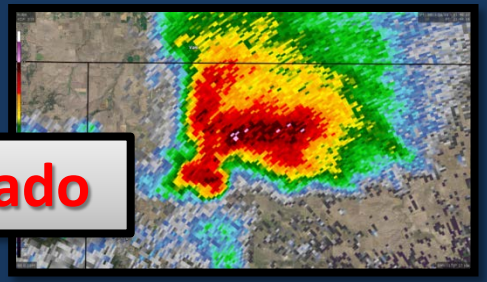
More things we know:

Local study of several cases provides input to the development of a conceptual model for storms not likely to produce tornadoes:



Local research

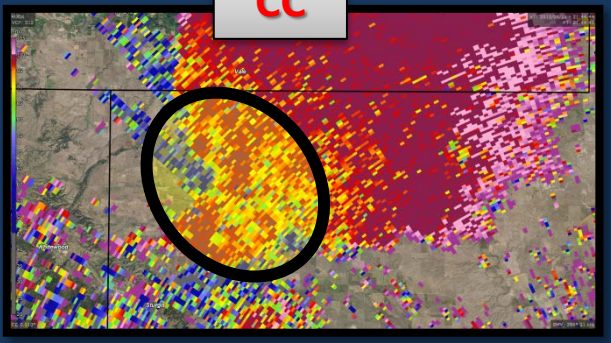
Going back to this storm:



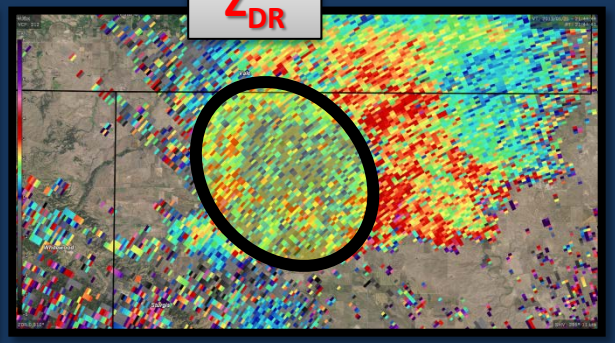
No Tornado

What clues did Dual Pol data have?

CC



Z_{DR}



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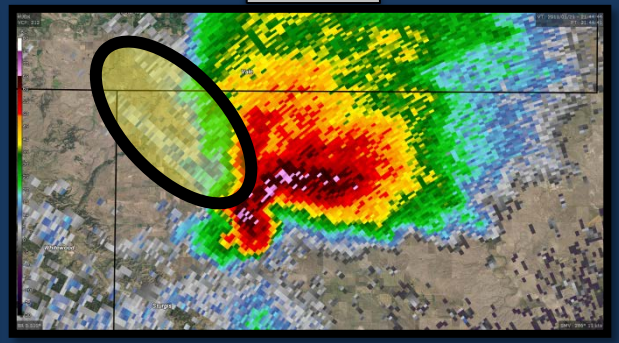
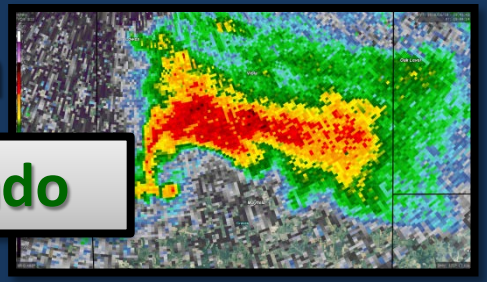


All indicators of hail in the critical downdraft portion of the storm

Local research

Going back to this storm



Tornado

What clues did Dual Pol data have?

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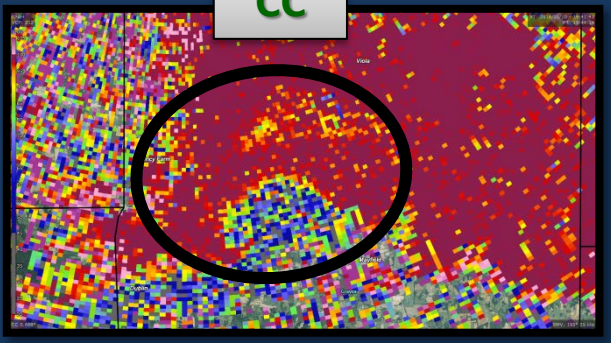
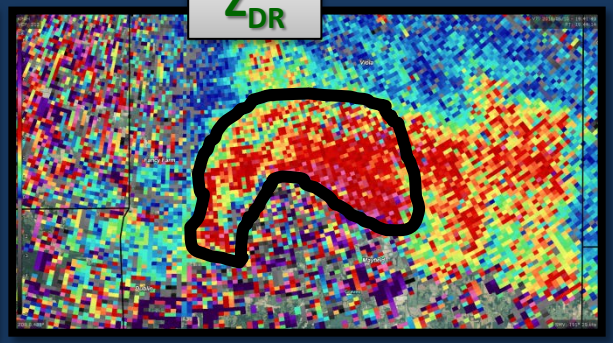
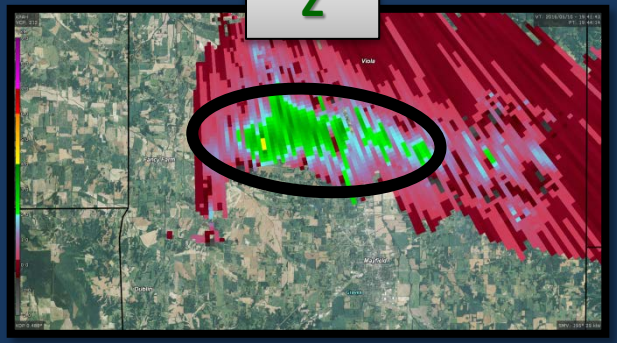


Z_{DR}



Z



All indicators that low level circulation could increase markedly

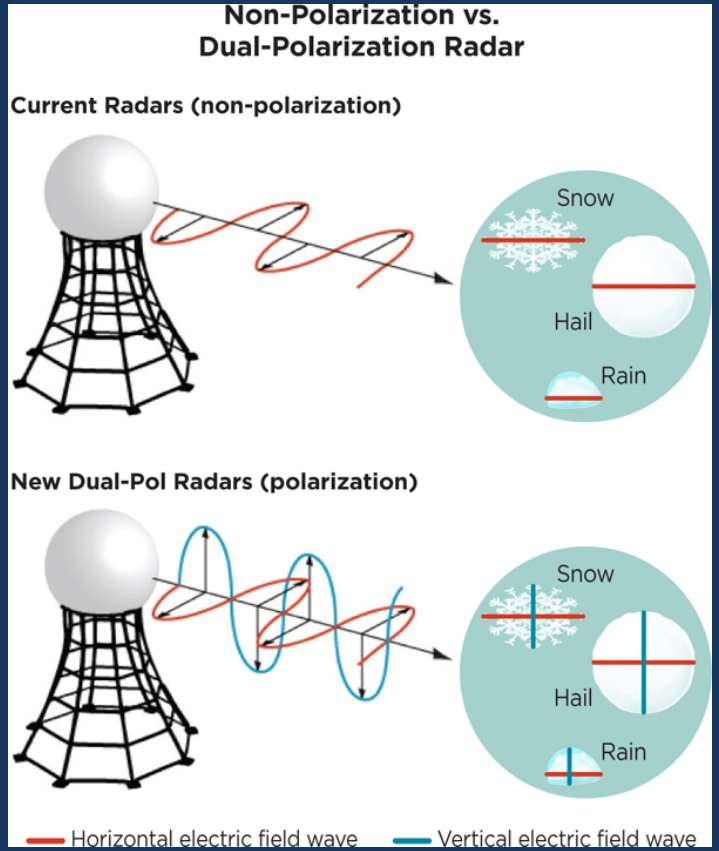
What info from spotters is critical?

- Rotating updraft
  - Confirms the presence of a supercell
- Wall cloud
  - Flat base or ragged?
  - Rotating?
- Funnel or tornado?
  - Only you can see if the storm is interacting with the ground! (Dust swirl)

When reporting a funnel…

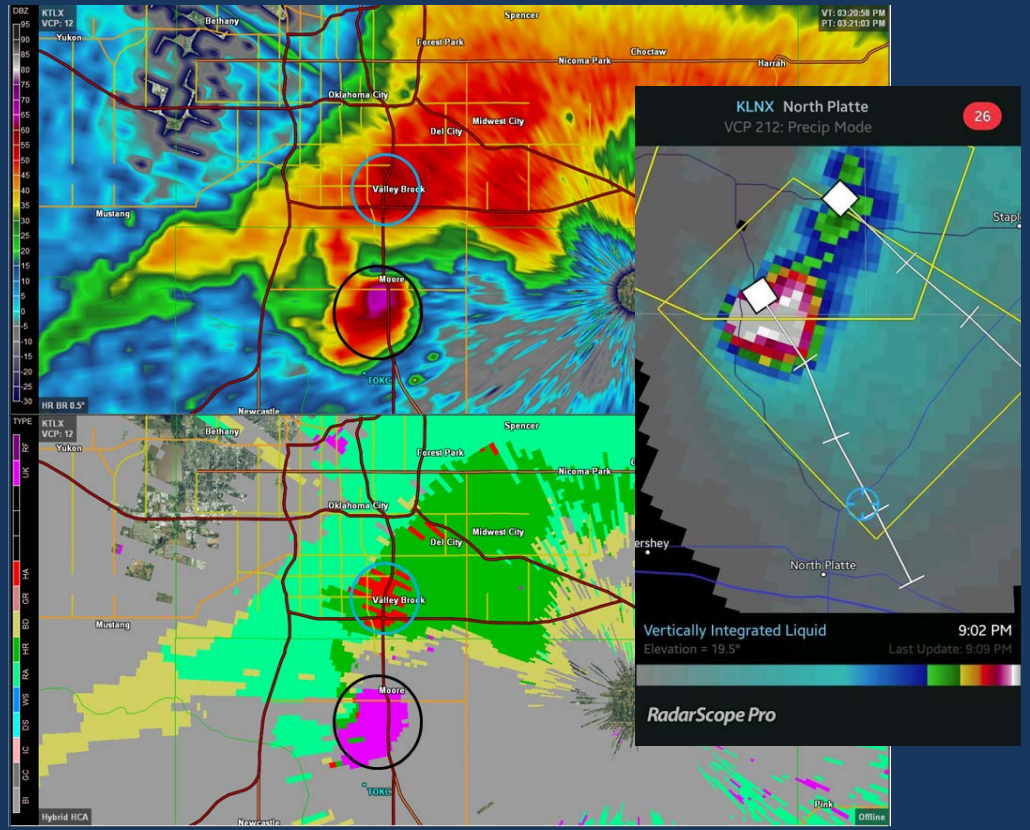
- Note which side of the wall cloud it is on
  - For true supercell tornadoes, if you are standing with your back to the inflow, the funnel/tornado should be on the *right side* (cyclonic) of the wall cloud
  - If on the left side the tornado may be anticyclonic
  - If only a funnel is observed ***it is critical to look at the ground*** for rotation
    - Increasing research suggesting tornadoes form from the very low levels -> upward
    - Condensation funnel may not seem visibly connected with the ground
      - ***But the circulation might be!***

Dual-Pol Radar



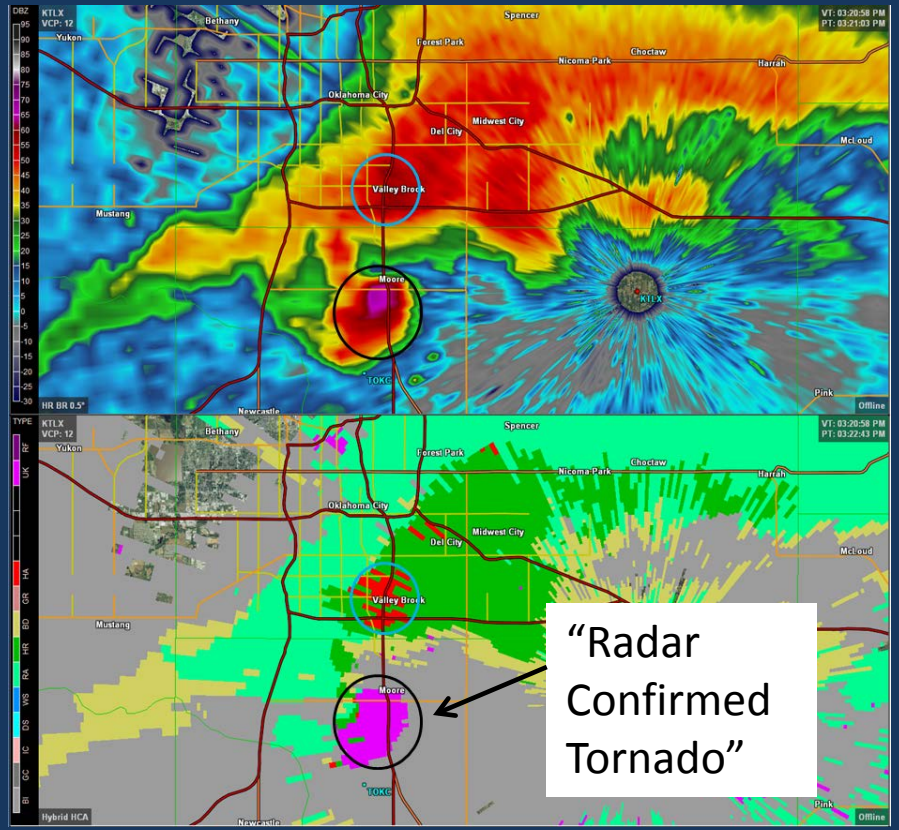
- Improves accuracy of precipitation (amount) estimates
- Can tell the difference between rain, hail, snow, or debris / organic matter like birds, insects
- Can estimate droplet distribution (rainfall rates)

Useful Stuff – large hail



- High Reflectivity
- "Hydrometeor Classification" = Red / Large hail
- High "Digital VIL"
- ZDR near zero

Useful Stuff – Tornado Confirmed



- High Reflectivity
- Hook Echo
- Velocity "Couplet"
- "Hydrometeor Classification" = Purple / Biological

Break!

Today's Topics

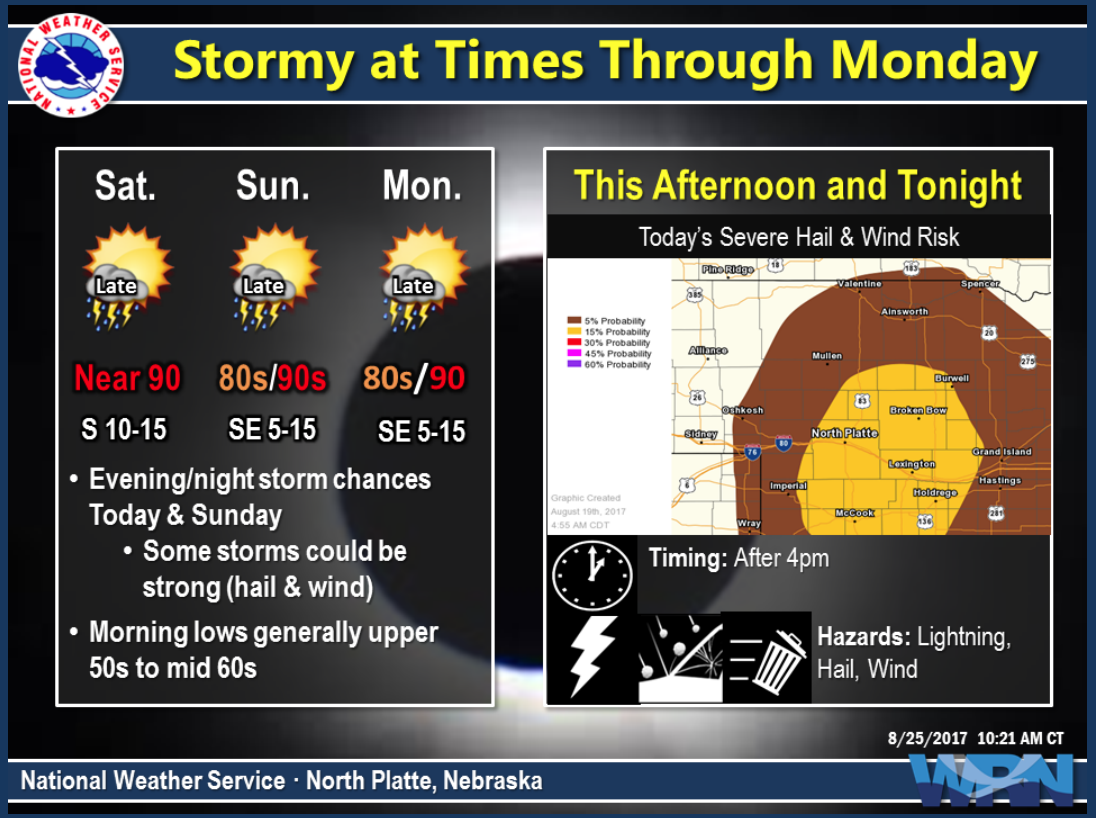
- Brief Review of last year's season
- Forecasting Severe Weather
- Tornadogenesis & Advanced Radar Interpretation
- A look at the Almeria Storm
- Spotting, Reporting, and Safety

Almeria

Why this storm?

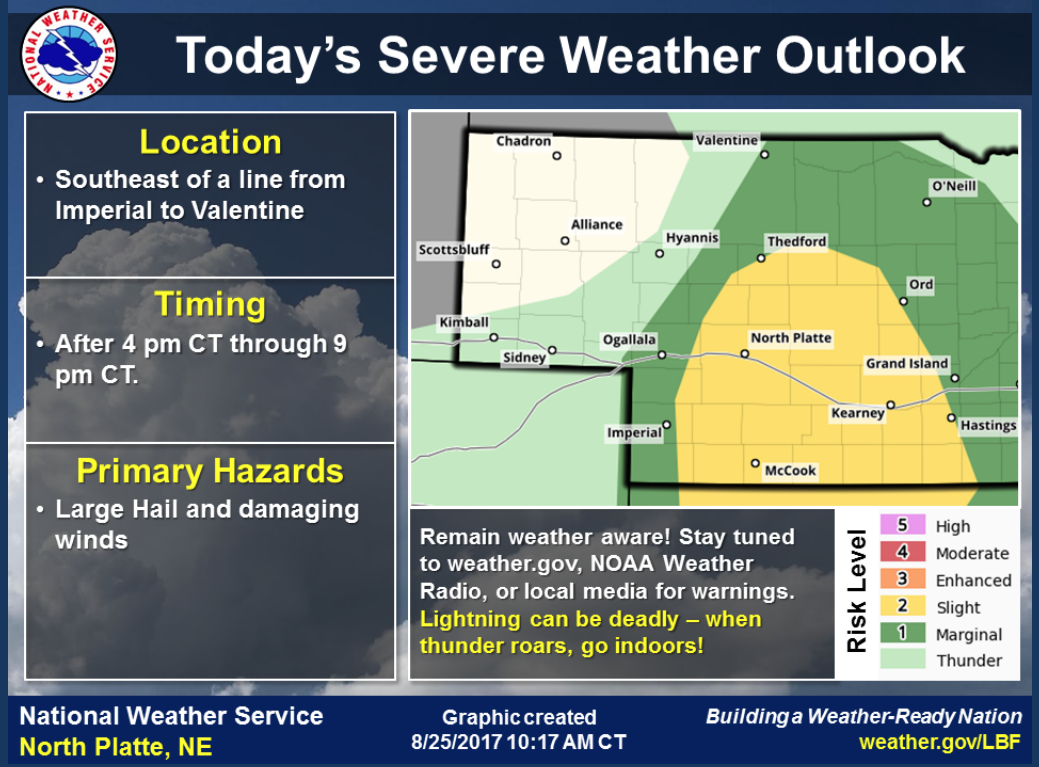
- It was the “best” one of the year!
- It was fascinating
- Every time we look at it, we notice something new

Set-Up – August 19th



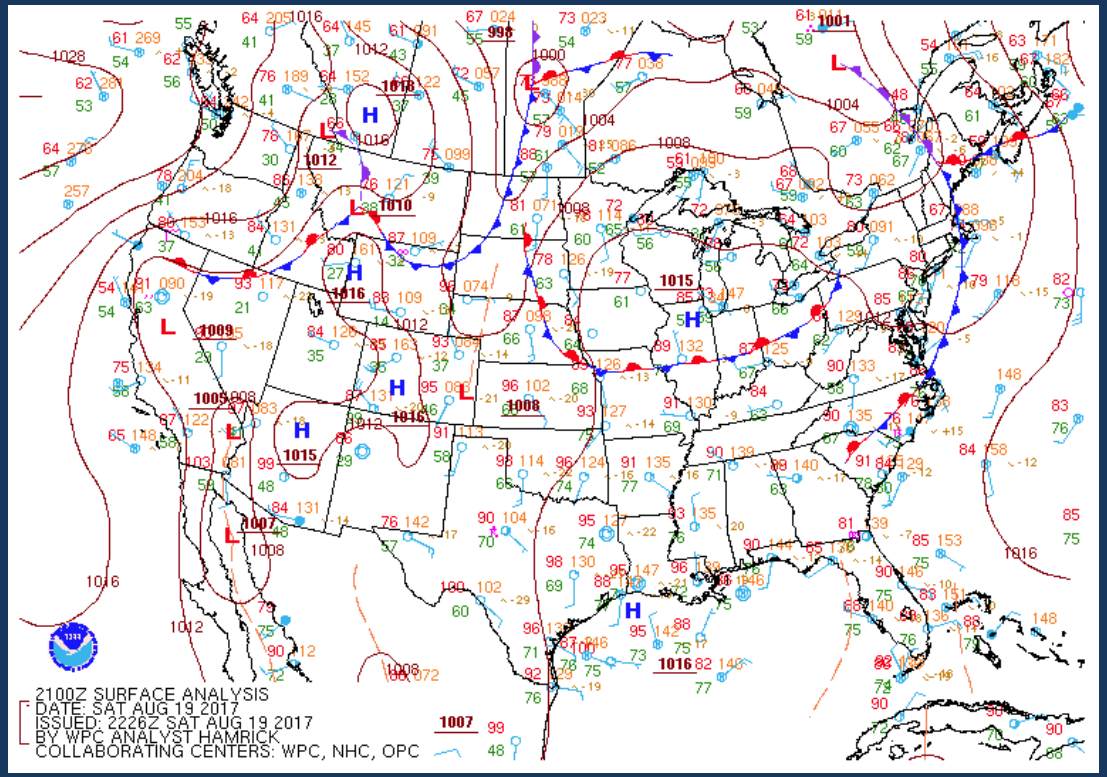
The morning forecast highlighted the chance for thunderstorms on the 19th and through the weekend leading up to the Solar Eclipse. Primary hazards were expected to be strong wind and hail. The tornado probability was less than 2%

Set-Up – August 19th



Day 1 Thunderstorm Outlook from the Storm Prediction Center had much of central Nebraska in a Slight Risk for severe thunderstorms. Loup County and the town of Almeria were on the northern edge of this area.

Set-Up – August 19th

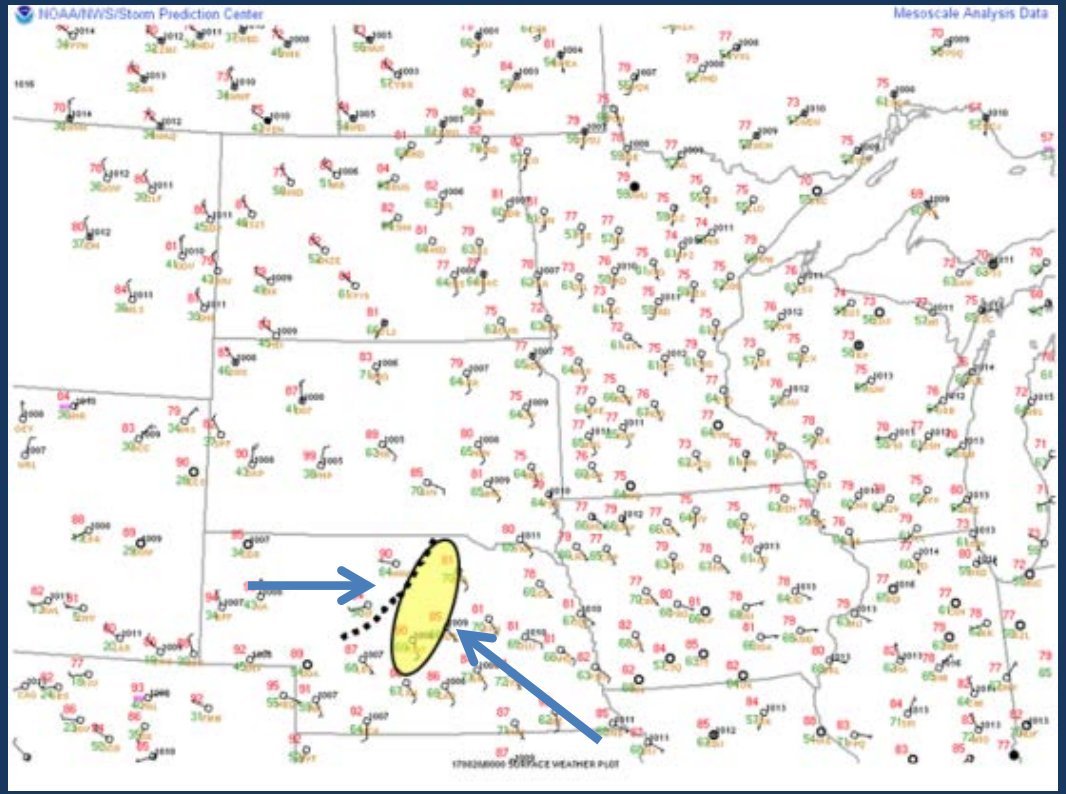


The afternoon surface analysis showed a stationary front in eastern Nebraska and a trough moving into western Nebraska. Aloft, a short wave disturbance moved out of Wyoming and into the Panhandle. This disturbance was expected to provide some broad lift needed to generate thunderstorms in the afternoon and evening.

Remember…Severe Thunderstorms

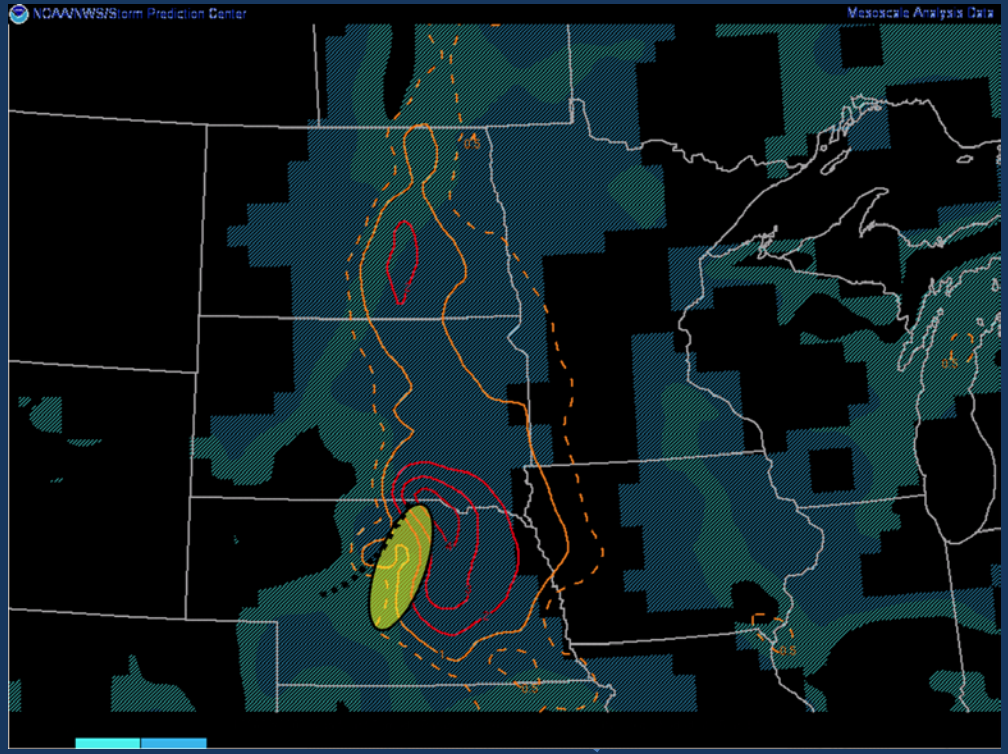
- Moisture – surge of moisture arriving from the plains this day
- **INSTABILITY** – Plenty. Over 2500 J/kg of CAPE (we'll go over that later) on the morning sounding
- Lift – Lee Trough, upper level disturbance, and a Dryline
- *Spin* – Modest on this day but additional spin provided by a low level jet and nearby storm interaction

Set-Up – August 19th



This figure shows the surface map at the time the thunderstorm underwent rapid intensification. Notice how the winds to the west of the line and the winds toward the east of the line are going in opposite directions. This shows an area of strong convergence, which would provide a source for lift.

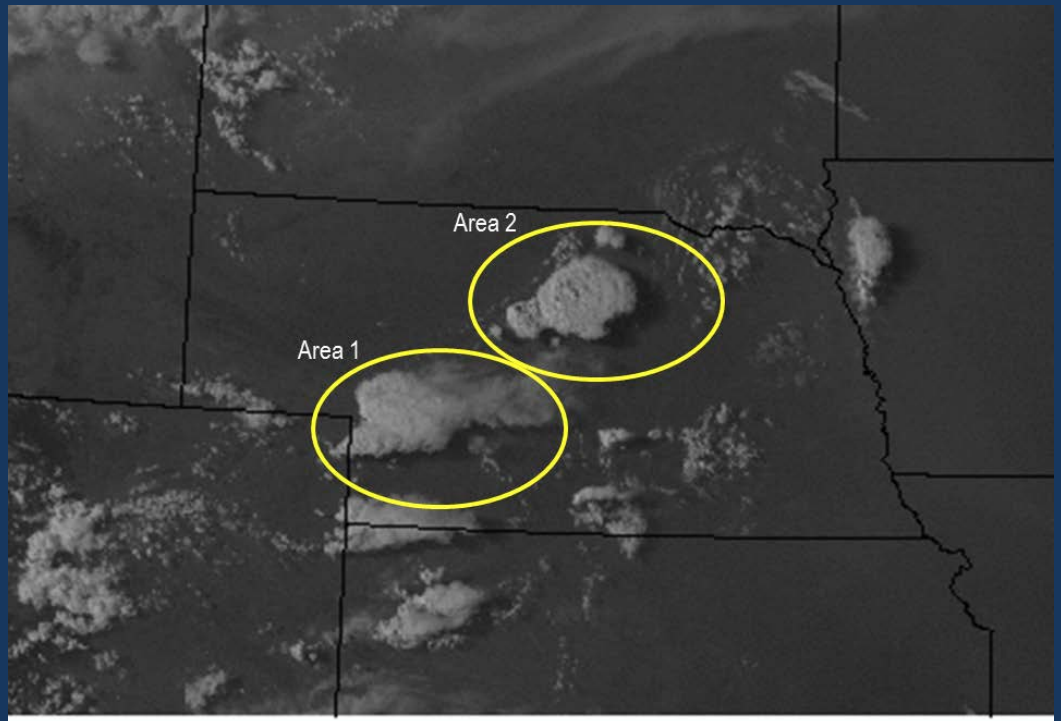
Set-Up – August 19th



The red and orange lines in this image show the “Significant Tornado Parameter”.

Note the sharp increase from west to east. This indicates that the storm was moving into an environment that was favorable for tornadoes at this time (around 7:00pm CDT)

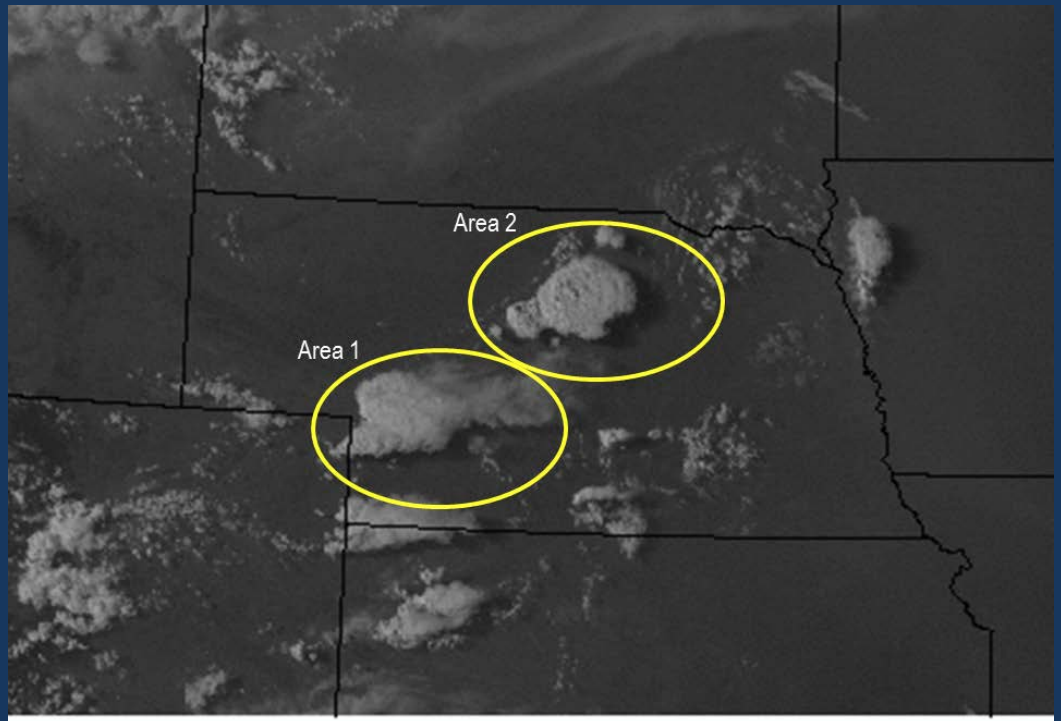
Set-Up – August 19th



As the storms started developing, the southern cluster was in what was supposed to be the more favorable airmass. The models had this area as the primary area to watch for much of the day.

The second area of development looked like, in the model data, they would present more of a straight-line wind threat.

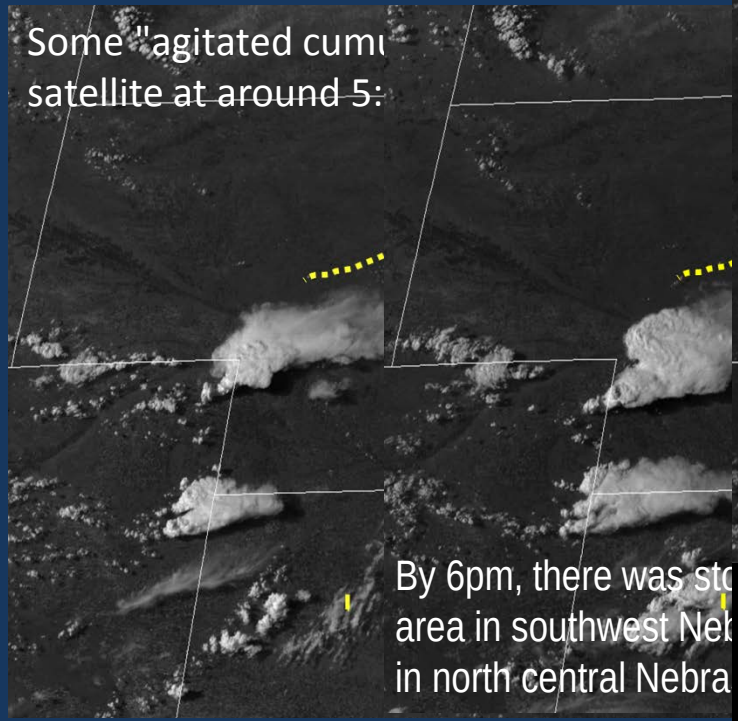
Set-Up – August 19th

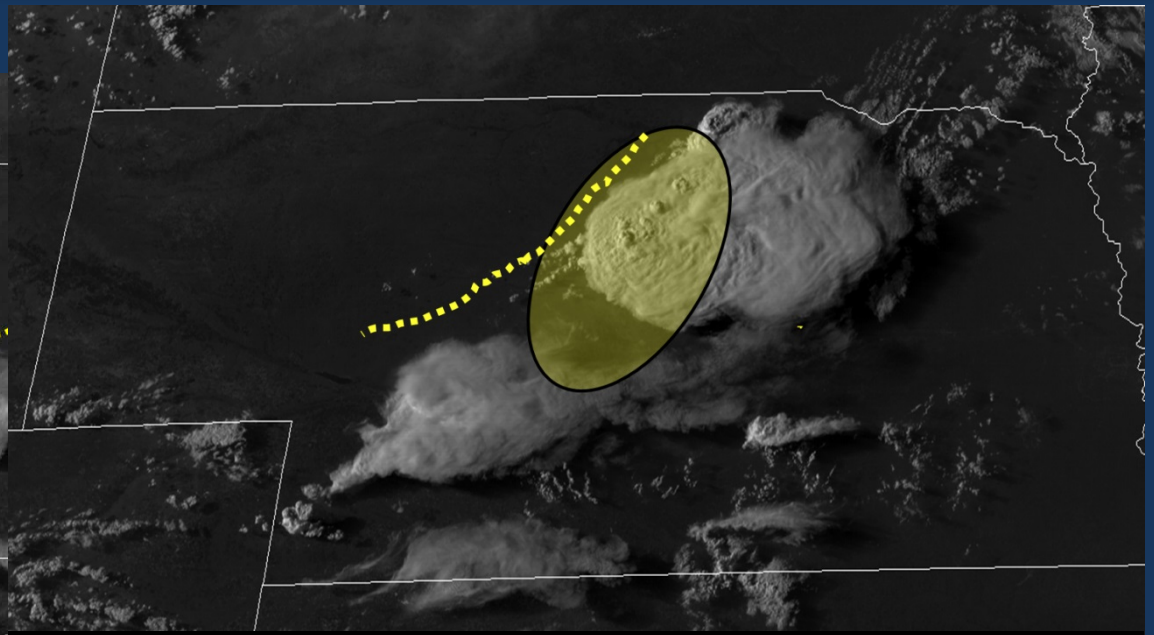


Area 1 ended up never sustaining any storms that moved into it.

This left all of the energy available for Area 2…

Satellite Data

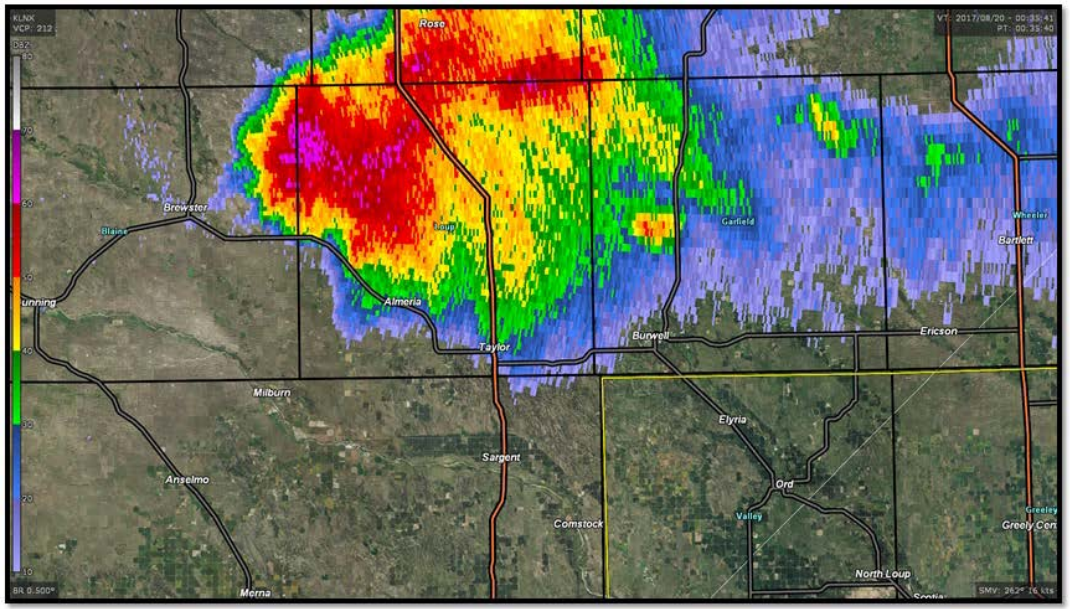




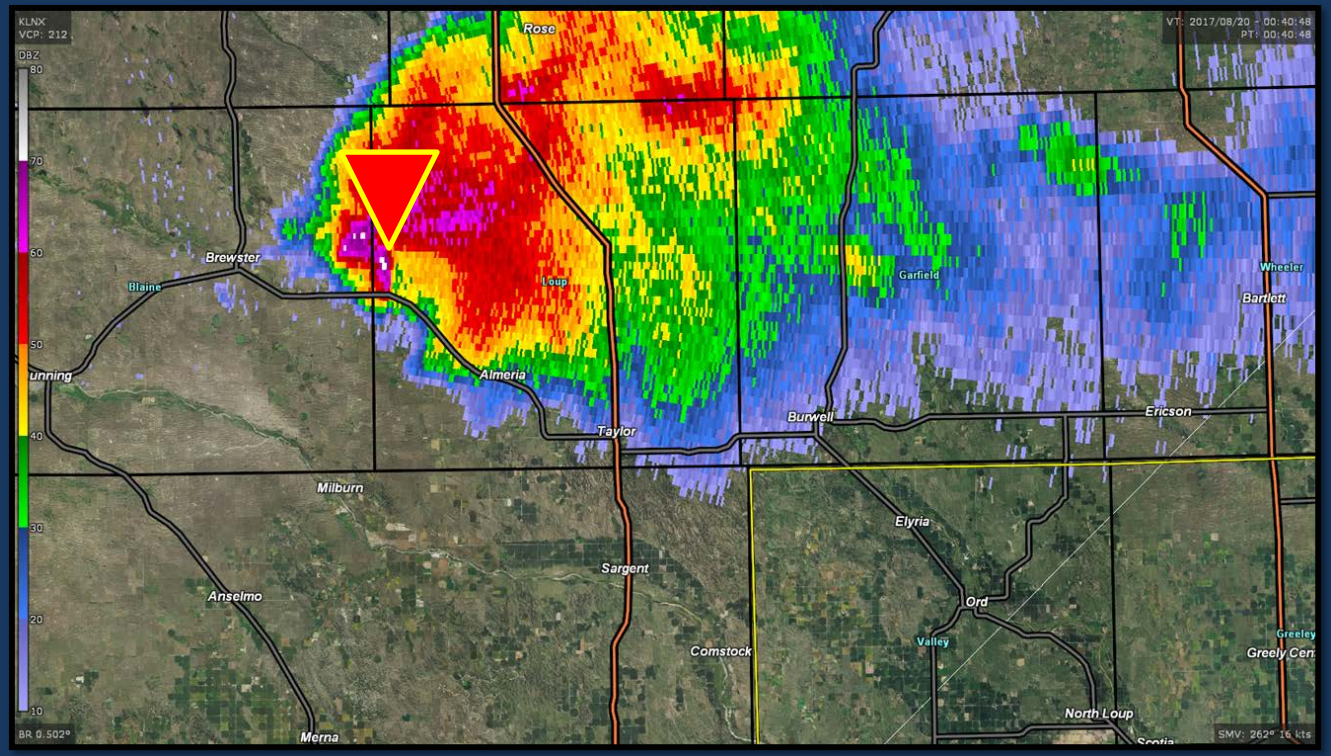
20 min later…you can see how quickly the storm grew once it approached the better instability, moisture, and spin in the atmosphere. It only grew larger from here. (but these are visible satellite images and we began to lose daylight)

Radar

0.5° Reflectivity

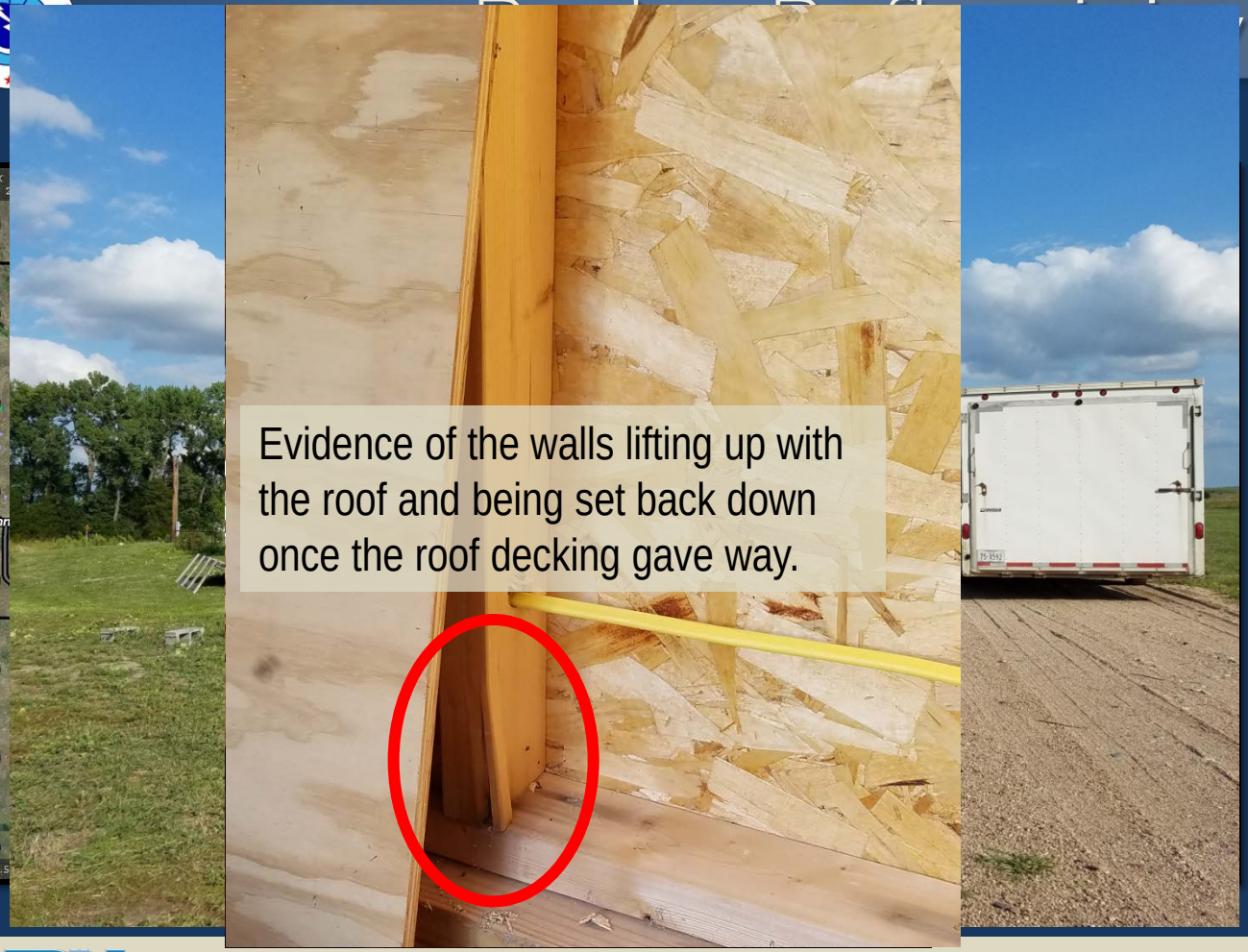


Radar Reflectivity



Tornado #1

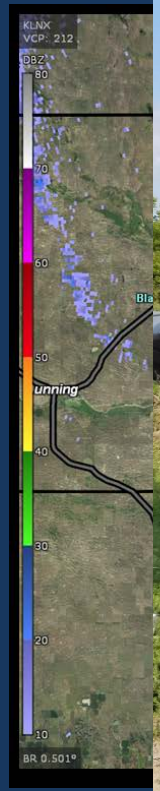
Got a few trees
EF-0
Est. 65mph Winds



Tornado #2

Partial roof loss on home. Trusses were anchored with hurricane clips. Snapped power poles.

EF-1
Est. 105mph Winds

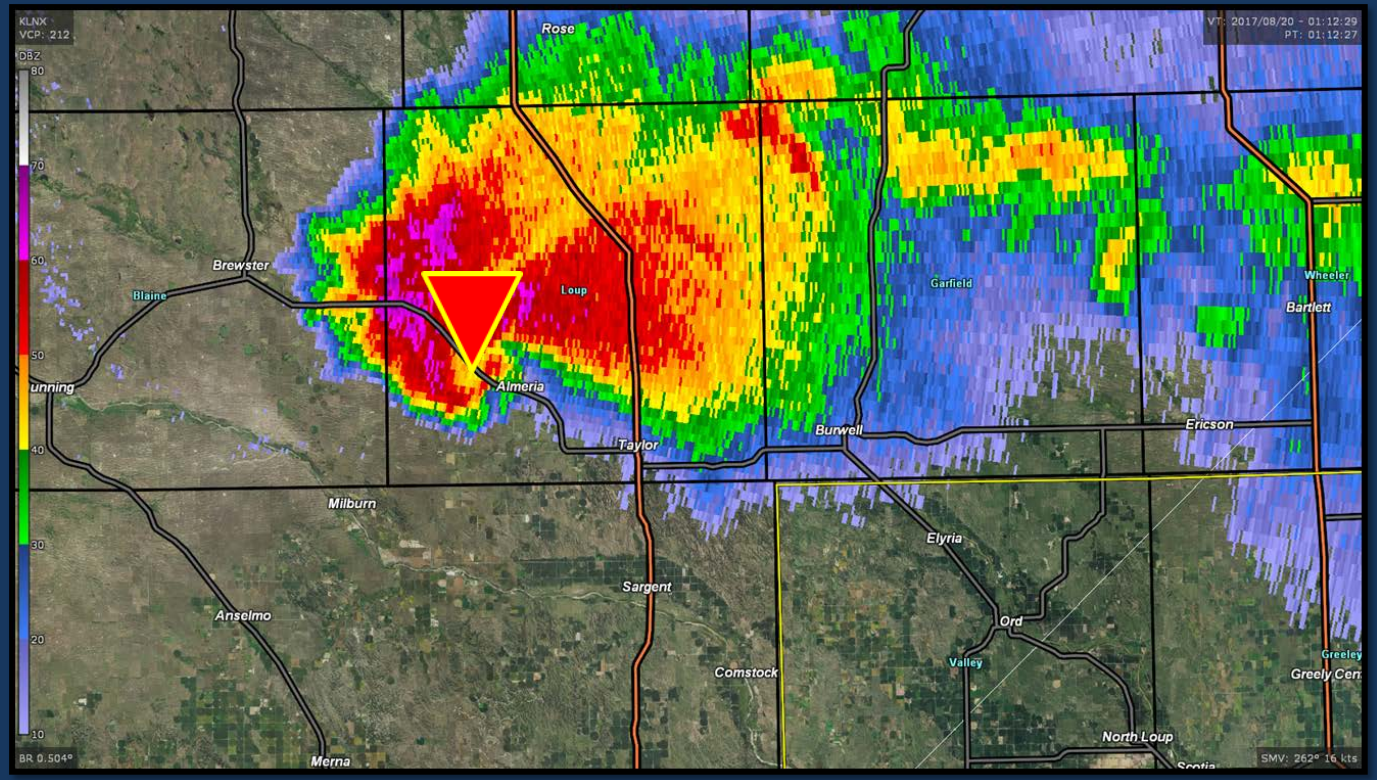


Tornado #3

Snapped Poles, trees,
arge quonset hut lifted,
twisted about 90
degrees, and collapsed.

EF-1
Est. 100 mph Winds

Radar Reflectivity



Tornado #4

The crop circle.
EF-0
Est. 75mph Winds

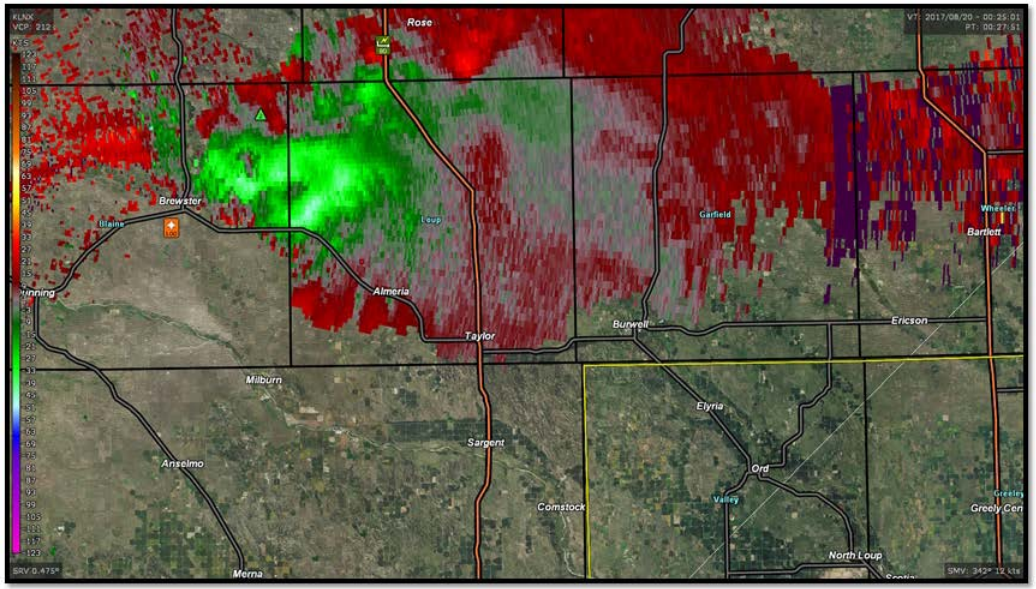
rnado #5

e Dunbar Ranch,
merous trees debarked,
isted, uprooted, poles
apped.

-2
t. 120mph Winds

Velocity Loop

0.5° Storm-Relative Velocity



Video – Ann Wurst

Today's Topics

- Brief Review of last year's season
- Forecasting Severe Weather
- Tornadogenesis & Advanced Radar Interpretation
- A look at the Almeria Storm
- Spotting, Reporting, and Safety

Spotting & Reporting

What We Want to Know

- Who you are (trained spotter)
- What you saw (weather event or damage)
  - Let us know your uncertainty
- When & where the event occurred
  - Distance & direction to nearest town
  - Well-known road (highway) or landmark
  - Latitude/longitude

How to Reach Us

Severe Weather Spotter Line

1-800-603-3562

Alternate number in operations

308-532-0921

Facebook and Twitter: NWSNorthPlatte

Immediate reports best *if safe*,
delayed reports also appreciated

Severe Thunderstorm Criteria

One or more of the following:

- ✓ Tornado
- ✓ Wind: 58+ mph
- ✓ Hail: 1”+ diameter
- ✓ Flash flood

Estimating Wind Speed

30 - 40 mph	Whole trees in motion
40 - 50 mph	Twigs or small branches breaking
50 - 60 mph Severe = 58+	Slight structural damage; Large branches breaking
60+ mph	Down or snapped trees; Structural damage
70 / 100 mph	Pivot systems flipped: empty / full

It's Easy to Over-estimate Wind

Hail Size Reports

- Size of largest hailstone
  - Estimated or measured
  - Pictures are appreciated
- Any damage
- Wait until it's done hailing to collect!

Hail Reference Chart


Pea: 1/4"


Dime: 2/3"


Penny: 3/4"


Nickel: 7/8"


Quarter: 1"


Half Dollar: 1¼"


Ping Pong Ball: 1½"


Golf Ball: 1¾"


Hen Egg: 2"

Billiard Ball: 2¼"


Tennis Ball: 2½"


Baseball: 2¾"

Softball: 4½"

CoCoRaHS

"Spot" year-round:

We appreciate rainfall and snowfall reports!

www.cocorahs.org

NWS North Platte

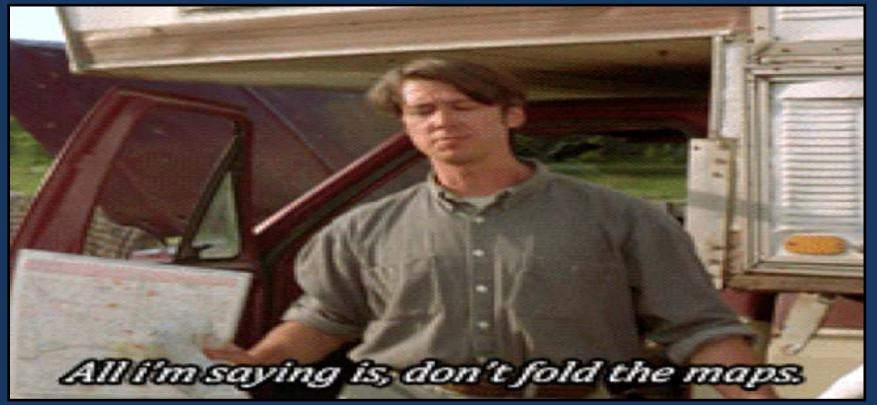
Safety

Man who mowed lawn with tornado behind him says he 'was keeping an eye on it.'

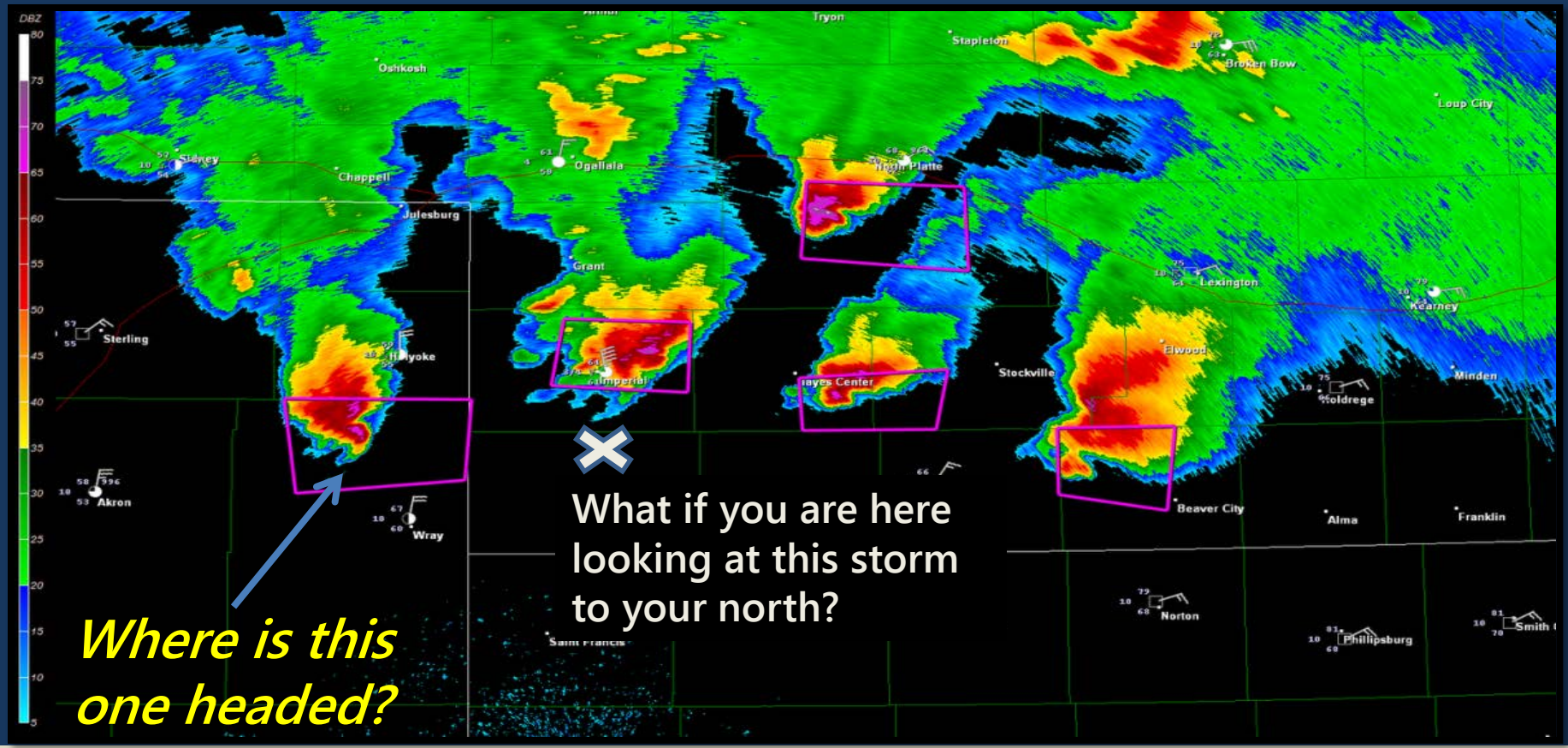
THE CANADIAN PRESS
JUNE 3, 2017 04:59 PM

A Few Rules to Spot By

- Maintain situational awareness
- Multiple lines of communication
- Know your escape routes
  - Map/atlas a good idea
- Know where safe shelters are located
- No report is worth your life!



Situational Awareness



Tornado Safety - Outside

- Seek sturdy shelter immediately!
  - Overpasses do NOT count

If not possible:

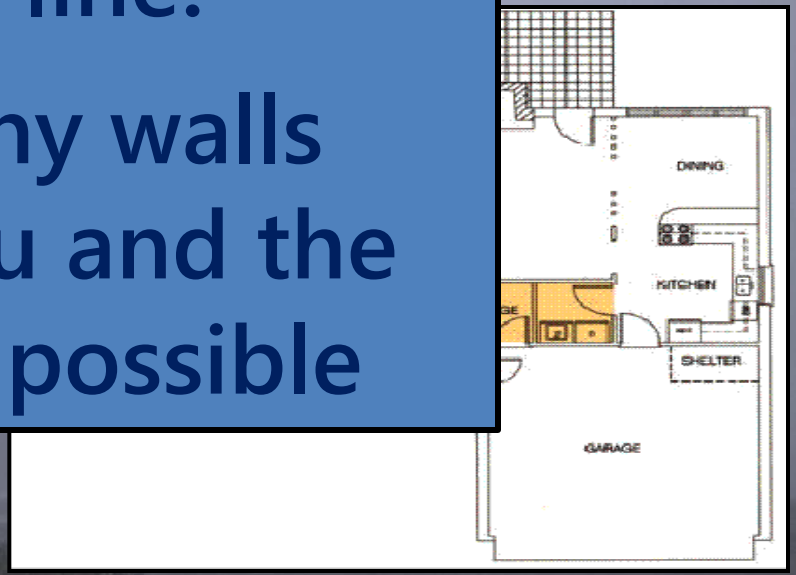
- Drive out of its path *if* tornado is visible *and* traffic is light
- Last resort: get lower than the roadway and cover your head

Tornado Safety - Inside

- Lowest possible floor
  - Basement or storm shelter if available
- Stay away
  - Closet, u
- Get down
  head
  - Pillows, b
- **If in a mobile home, find sturdier shelter**

Bottom line:

Put as many walls between you and the tornado as possible



Flooding Safety

Lightning Safety

- Don't forget about this while spotting!
- Flash-to-
  distance
  - Count
    thunde
    numbe
- Can strik
  away fro
  - Bolts from the blue

Bottom line:

Hear thunder?

You're close enough to be struck by lightning!

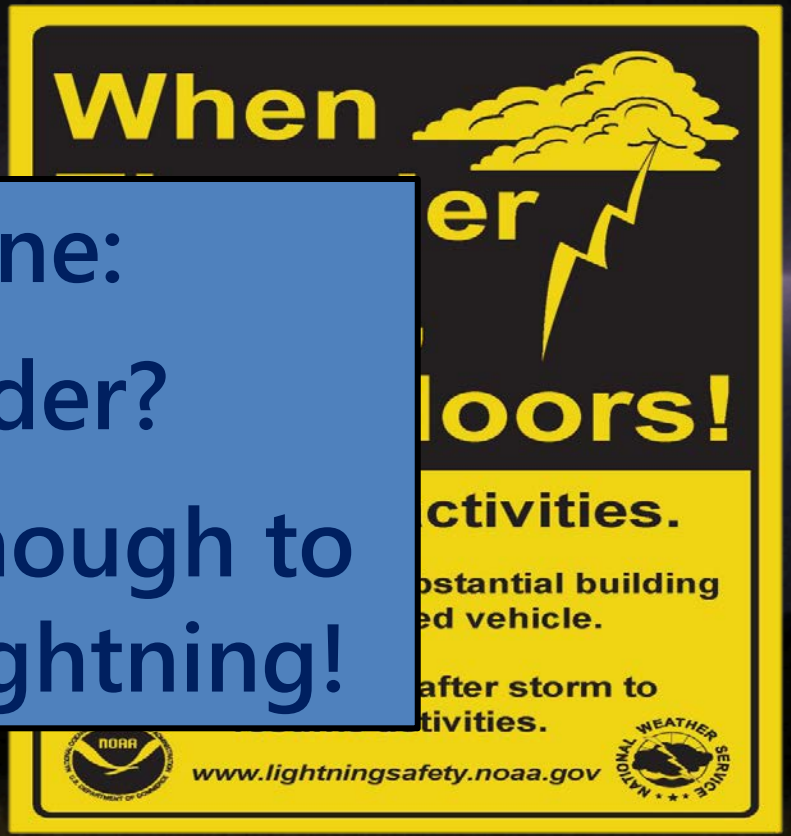


Photo credit: Les Green

Lightning Safety

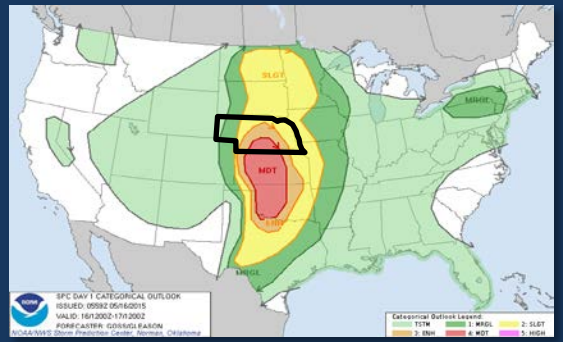
- 80% of lightning fatalities from not seeking shelter during recreational activities
- Trees do not count as shelter
- Fishing boat on a lake = bad idea
- If stuck outside, crouch – don't lie down

NWS Products and Services

Severe Weather Products

OUTLOOK

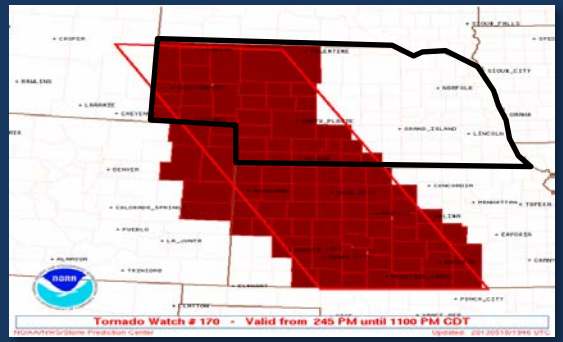
Days Ahead



Highlights general area at risk for severe weather

WATCH

Hours Ahead

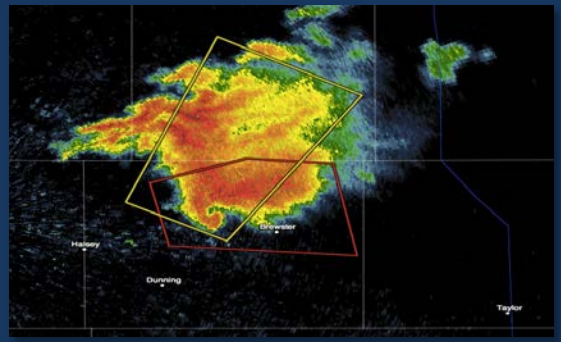


Conditions are favorable for severe weather over the next several hours.

Plan, prepare, and be aware!

WARNING

NOW



Severe weather is imminent or occurring in the area.

Take immediate action to protect life and property!

Hazardous Weather Outlook

- Updated each morning & afternoon, more if needed
- Highlights potential weather hazards through 7 days
- Spotter Information Statement

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF WESTERN AND NORTH CENTRAL NEBRASKA.

.DAY ONE...TONIGHT.

SCATTERED SEVERE THUNDERSTORMS ARE EXPECTED TO DEVELOP THIS EVENING ACROSS MUCH OF WESTERN AND NORTH CENTRAL NEBRASKA. THE RISK IS GREATEST ALONG AND NORTH OF A LINE FROM FROM VALENTINE TO AINSWORTH AND ONEILL WHERE WIND GUSTS TO 80 MPH MAY DEVELOP. HAIL TWO INCHES OR LARGER IN DIAMETER IS POSSIBLE ACROSS NORTHERN SHERIDAN COUNTY. AN ISOLATED TORNADO MAY FORM BETWEEN VALENTINE AND GORDON.

EXTREME INSTABILITY WILL PROMOTE THE DEVELOPMENT OF SEVERE THUNDERSTORMS ELSEWHERE ACROSS WESTERN AND NORTH CENTRAL NEBRASKA. WIND DAMAGE AND LARGE HAIL ARE THE THREAT IN THIS AREA.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY.

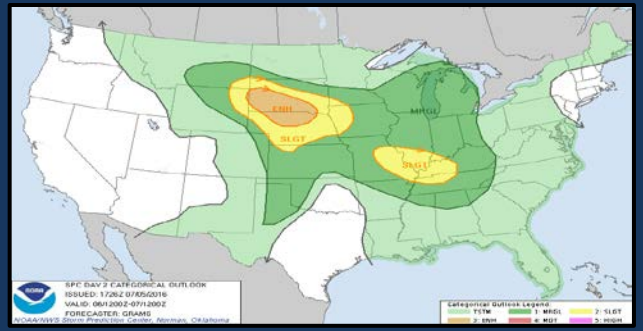
THUNDERSTORMS ARE POSSIBLE THURSDAY AND SATURDAY THROUGH TUESDAY. STORM COVERAGE IS EXPECTED TO BE MOSTLY ISOLATED. THE RISK OF SEVERE WEATHER IS LOW AT THIS TIME.

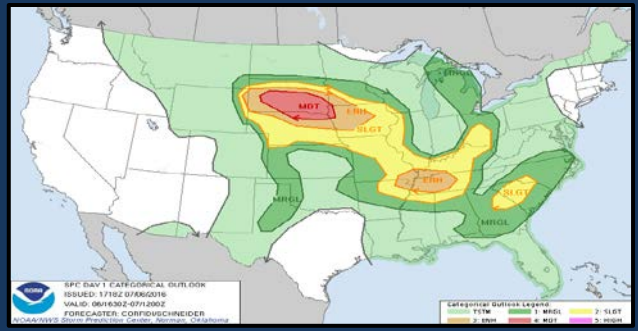
.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION MAY BE NEEDED THIS EVENING ACROSS PARTS OF WESTERN AND NORTH CENTRAL NEBRASKA.

Forecasts Change – Stay Tuned!

Outlooks for July 6, 2016

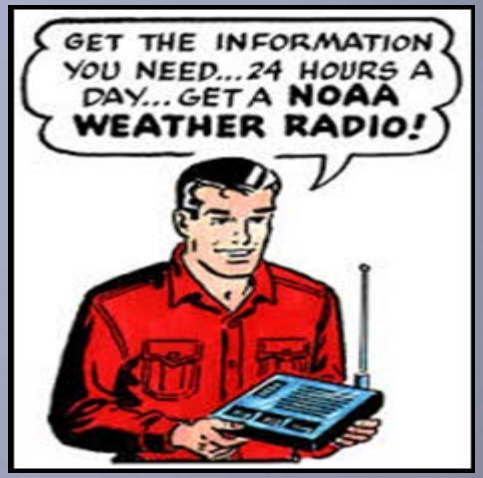




2 Days Out	1 Day Out	Day Of
Slight Risk (Cat. 2)	Enhanced Risk (Cat. 3)	Moderate Risk (Cat. 4)

Where to Find Our Stuff

- Weather.gov/LBF
- Mobile.weather.gov
  - "Widget" (not an app)
- Facebook.com/NWSNorthPlatte
- Twitter: @NWSNorthPlatte
- NOAA Weather Radio



- Other providers:
  - Local media
  - Phone carriers

Thank You For Your Service!

Questions?

Please fill out the survey on the back of the white card and bring it up when you're done