

Day 1 Convective Outlook  
NWS Storm Prediction Center Norman OK  
1109 PM CST Mon Nov 28 2022

Valid 291200Z - 301200Z

...THERE IS A MODERATE RISK OF SEVERE THUNDERSTORMS ACROSS FAR EAST-CENTRAL LOUISIANA INTO CENTRAL MISSISSIPPI...

...SUMMARY...

Severe thunderstorms capable of producing tornadoes, very large hail, and a few severe wind gusts are expected this afternoon into the overnight period across parts of the lower to mid Mississippi Valley and parts of the Southeast. A few strong tornadoes will be possible.

...Synopsis...

A surface low will deepen while tracking from Kansas to the Great Lakes today, accompanied by an eastward advancing upper trough and strong mid-level jet stream will overspread an intense low-level jet across the OH/TN Valleys into the Southeast. As such, strong deep-layer flow and shear will overlap with a moistening, destabilizing airmass from late morning to early evening from the lower MS Valley east-northeastward. Several strong to intense thunderstorms are expected to organize and promote a relatively robust severe threat, particularly across the Southeast, where regionally higher instability should reside.

...Portions of the Lower MS Valley today into early tonight...

Strong warm-air advection should be underway across the Lower MS Valley at the start of the period (12Z), with rich boundary-layer moisture being transported northward by a 40-50 kt southwesterly low-level jet. Through the day, at least modest surface heating should support surface temperatures rising into the lower 70s F and upper 60s F dewpoints within the warm-air advection regime, where an increase in thunderstorms is also expected. 50-70 kts of west-southwesterly 500 mb flow and 6.5+ C/km lapse rates will overspread the lower MS Valley and the warm-air advection regime by early afternoon, contributing up to 1500 J/kg MLCAPE, which is adequate in supporting a severe threat.

Storms should eventually root into a gradually deepening boundary layer during the afternoon, taking advantage of the strong deep-layer and low-level speed/directional shear provided by the overlapping southwesterly low-level and westerly mid-level jets. Large, curved low-level hodographs with mid/upper-level elongation will support well over 50 kts of effective bulk shear, and 300-400 m2/s2 effective SRH. Supercell structures are expected initially, with large hail, tornadoes, and a few severe gusts all likely. A few instances of 2+ inch diameter hail and/or strong tornadoes are possible with the more robust supercells. Should a more dominant supercell develop, remain discrete, and traverse an axis of locally stronger surface heating/buoyancy, a long-tracked and intense tornado may occur. The latest high-resolution guidance consensus suggests this scenario would be most likely across central MS, where a Category 4/Moderate Risk is in place. Later at night, storms should grow upscale into more linear segments as the surface cold front and greater low-level convergence approaches. Damaging gusts should then become the main threat, though a few tornadoes remain possible.

...Parts of the OH/TN Valley into early evening...

A strong surface cold front should sweep across the OH/TN Valleys through the late afternoon and evening hours as the deepening surface low tracks across the Great Lakes. Strong convergence along the cold front should force a low-topped band of convection. Ambient tropospheric wind fields will be strong, with 55+ kts of flow likely just 1 km AGL. Downward momentum transport within this line may foster strong, occasionally damaging gusts, with a couple of severe gusts also possible, warranting the introduction of Category 1/Marginal probabilities this outlook.

..Squitieri/Darrow.. 11/29/2022

...East TX/OK to the Lower Mississippi Valley...

Have upgraded to a tornado-driven Moderate risk center Ark-La-Tex to central AR with the potential for severe occur within this region late today through tonight.

Middle 60s surface dew points are prevalent from cent Ark-La-Tex and should be diurnally maintained ahead o across eastern OK and most of AR. A swath of 50+ kt 8 southerlies will persist, yielding increasing boundar moisture through this evening beneath an elevated mix should result in a broad plume of MLCAPE from 1500-25 Mid-level height falls in conjunction with confluent should result in scattered storms developing in the afternoon from the Ark-La-Tex through central AR. More isolated discrete storms should also develop along the TX/OK. Elevated low-level moisture, which should increase in the afternoon, along with all-zar convective mode will likely transitioning predominate during the evening, the potential for a several hour numerous supercells traversing the Ark-La-Tex to cent yields a moderate confidence in the possibility of sev some of which could be strong.

During the overnight period, severe weather the range from the towards the lower Mississippi Valley will likely yield up growth into one or more larger QLCs that accelerate eastw an evolution will favor a potentially widespread damaging wind/embedded tornado threat continuing east into early Sa Overall intensity should be tempered to some degree by con outpacing surface-based instability, especially with north extent.

...Mid-MO Valley to the Ozarks...

Ahead of the aforementioned dry line, the warm sector will strongly capped early today, owing to a robust elevated mi However, as large-scale ascent notably increases this after cooling/moistening around 700mb, diabatic heating, and rel modest boundary-layer moisture return will foster around 1 J/kg of MLCAPE. Isolated to widely scattered thunderstorms expected to develop during the late afternoon, from the su south along the dryline. Elongated straight-line hodograph likely yield splitting supercells with very large hail the hazard. Rather warm surface temperatures in the 80s and dr aloft should tend to support outflow-dominated supercells. the tornado threat may become maximized in a narrow corrid the warm front across southwest IA. Storm intensity will n wane in the mid/late evening.

..Grams/Goss.. 04/13/2018

Day 4-8 Convective Outlook  
NWS Storm Prediction Center Norman OK  
0345 AM CST Mon Dec 12 2022

Valid 151200Z - 201200Z

...DISCUSSION...

Medium-range models are in reasonably good agreement through Day 5/Friday -- during which time a cold front is progged to shift across Georgia/the Carolinas/Florida. Beyond Day 5, models begin to diverge with respect to devolution of the upper low as it drifts across the Upper Great Lakes/Upper Mississippi Valley vicinity.

On Day 4/Thursday, as the cold front crosses Georgia and the coastal Carolinas, and shifts southward across Florida, some severe-weather potential is expected continue, with strong storms likely ongoing at the start of the period. With sufficient instability anticipated, along with favorable shear for organized/rotating storms, expect potential for damaging winds and a tornado or two to cross Georgia and perhaps southern parts of South Carolina through the day, before storm effects dissipate. The cold front will affect the area and the far from south storms ongoing ahead the south coast moving from Florida across the Carolinas. The cold front will likely bring winds a possibly a tornado or two may occur through afternoon. Risk should diminish overnight, and then will likely be minimal Day 5/Friday, with the front expected to reach/clear far southern Florida and the keys through the first half of the Day 5 period.

Beyond Day 5, the model solutions diverge, the general severe weather risk should remain mostly low, though most if not all states that have not been previously mentioned.

Day 1 Convective Outlook  
NWS Storm Prediction Center Norman OK  
1150 PM CST Mon Nov 07 2022

Valid 081200Z - 091200Z

...NO SEVERE THUNDERSTORM AREAS FORECAST...

...SUMMARY...

Organized severe thunderstorms are unlikely across the continental U.S. today and tonight.

...DISCUSSION...

At upper-levels, a low will move inland across northern California today as flow remains southwesterly across much of the western half of the nation. An upper-level ridge will remain in place across the eastern U.S. At the surface, high pressure will dominate from the Mississippi Valley eastward to the Atlantic Coast. Out west, a dual-centered low will move into northern California and central Nevada by afternoon. Widespread large-scale ascent, associated with the upper-level system, will make thunderstorm development possible today across much of California and the Intermountain West. Isolated to scattered thunderstorms will also be possible today from Oklahoma north-northeastward into the upper Mississippi Valley, along and near a corridor of strong low-level flow. Isolated to scattered thunderstorms may also develop in parts of south Texas and across the Florida Peninsula. No severe threat is expected today or tonight across the continental United States.

..Broyles/Thornton.. 11/08/2022

ISK OF SEVERE THUNDERSTORMS FROM PARTS OF THE EASTERN TEXAS PANHANDLE TO WESTERN AND

RISK OF SEVERE THUNDERSTORMS OVER PARTS OF NEW ENGLAND...

does, some potentially long-track and violent, to this evening over portions of northwest Texas :ral Oklahoma. More isolated but still ; severe weather, including tornadoes and hail, is possible in surrounding parts of s, and Arkansas.

forecast to unfold this afternoon and evening at TX and western/central OK. Moisture northward across the region, with dewpoints in / high afternoon MLCAPE values of 3000-5000 ear profiles are also rapidly increasing as a low-level jet strengthens across the area. This combination of extreme instability and large ed on forecast soundings throughout the region.

ing inversion, strong low-level theta-e orcing, all signs point to rcells this afternoon across that persists in this rnadoes, very large hail, test concern, including a lent tornadoes, will extend tern and central Oklahoma.

ected to affect these areas, e air mass is present. . These storms will winds, and isolated s.

ver New England and eastern e air mass is present. pected to form in this area, nd coast during the late ates and westerly flow aloft nds and some hail in the



# Forecast Journals

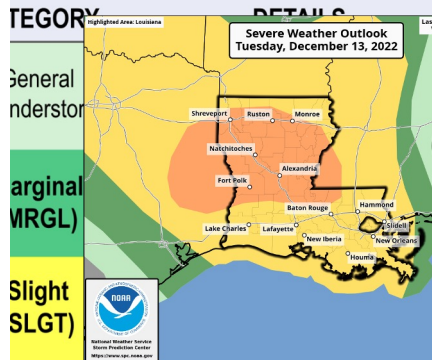
Your task:

- Use observations and short/long range models to create a series of SPC-style Day 1 convective outlooks.
- Each journal will have three parts:
  1. An SPC-style outlook graphic (categorical only, no individual hazards required)
  2. A Day 1 forecast discussion.
  3. Post event verification and discussion
- Your forecast journal will NOT be graded on forecast accuracy, but WILL be graded on:
  - Meteorological concepts and consistency
  - Incorporation of various observation networks (no model-only forecasts)
  - Spelling and grammar

**Please see the online rubric for further instructions and expectations.**

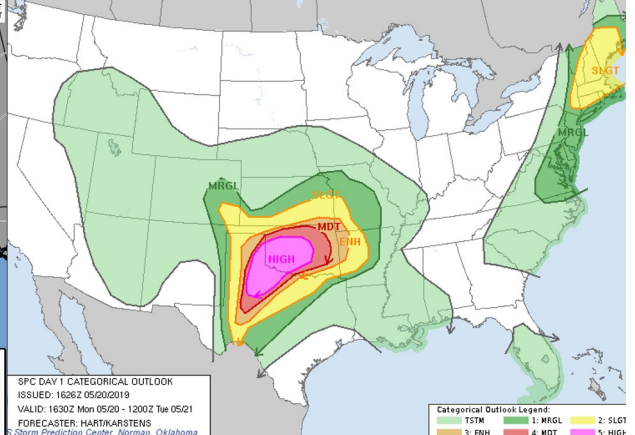
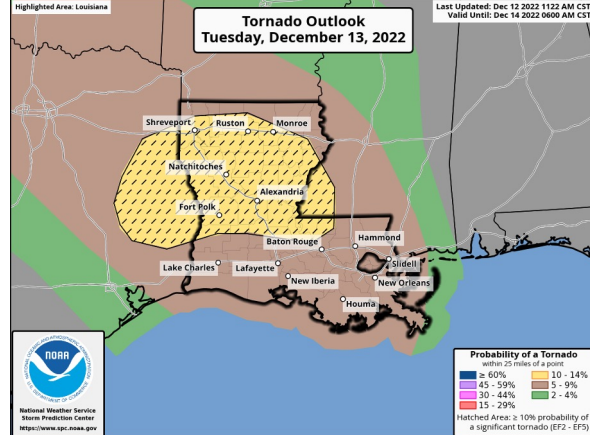
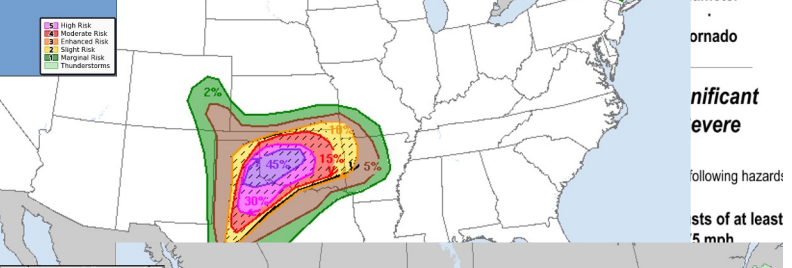
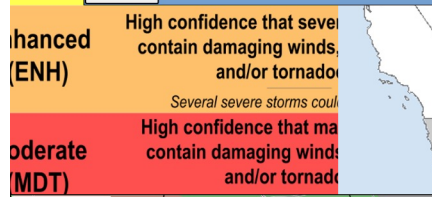


# Understanding Severe Thunderstorm Outlook Categories



There are so many graphics these days...

Why do we still bother with forecast discussions?





# Why does the NWS still write forecast discussions?



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# Graphics are great, but they can't convey all of the forecast information

All of this text is needed to just explain the SPC Convective Outlook Graphic.

We can't expect the public to know these details or the nuance of each forecast.

This nuance is best conveyed via the forecast discussion.

LEVEL	CATEGORY	DETAILS	SUMMARY	How many severe storms are possible?	How bad could the worst storms be?	DEFINITIONS
	General Thunderstorm	Although severe weather is not expected, <i>all</i> thunderstorms can produce deadly lightning, gusty winds, and small hail.	No severe thunderstorms expected		Similar to storms your area experiences many times per year	<b>Severe Storm</b> Any storm that contains at least one of the following: <b>Wind gusts of at least 58 mph</b> . <b>Hail at least one inch in diameter</b> . <b>Tornado</b>
<b>1</b>	<b>Marginal (MRGL)</b>	Some storms could be capable of damaging winds and severe hail. Localized tornado threat could develop.	Isolated severe storms possible		Similar to storms your area may experience several times per year	
<b>2</b>	<b>Slight (SLGT)</b>	Increased confidence that some storms will contain damaging winds, severe hail, and/or tornado potential. <i>A few severe storms could be significant</i>	Isolated to scattered severe storms expected		Similar to storms your area may experience a few times per year	
<b>3</b>	<b>Enhanced (ENH)</b>	High confidence that several storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms could be significant</i>	Scattered to numerous severe storms expected		Similar to intense storms your area may only experience once or twice per year	<b>Significant Severe</b> Any of the following hazards:
<b>4</b>	<b>Moderate (MDT)</b>	High confidence that many storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms likely to be significant</i>	Scattered to numerous severe storms expected		Similar to intense storms your area may only experience once per year or less	<b>Wind gusts of at least 75 mph</b> . <b>Hail at least two inches in diameter</b> . <b>Tornado of at least EF-2 rating</b>
<b>5</b>	<b>High (HIGH)</b>	High confidence that an outbreak of storms will contain tornadoes, damaging winds, and/or severe hail. <i>Tornado outbreak and/or widespread damaging winds</i>	Numerous severe storms expected		Very intense storms your area may only experience once or twice in a lifetime	

spc.noaa.gov | weather.gov



The most important concept:

## Know your audience

Writing for other meteorologists:

- **WHAT**
- **WHERE**
- **WHEN**
- **WHY**
- **CONFIDENCE**
- **POTENTIAL IMPACTS**



Gives mets the scientific information they need to craft their local message to public/partners.

Writing for decision makers and/or public:

- **WHAT**
- **WHERE**
- **WHEN**
- **WHY**
- **CONFIDENCE**
- **POTENTIAL IMPACTS**



Allows decision makers and the public to make informed decisions and take action. They don't necessarily care about "why" an event is occurring.



The most important concept:

**Note:** In this class we're going to focus on the "WHY" to help build our intuition of severe weather forecasting.

Writing for other meteorologists:

- **WHAT**
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# Anatomy of a Forecast Discussion

## **Summary/Bottom Line Up Front**

Summarizes the main/most important point of the discussion. Ask yourself “If people take one thing away from my discussion, what is it?”

Example: “Strong to severe thunderstorms are possible after 3 PM today for central Oklahoma.”

## **Synopsis/Feature Identification**

Discusses main synoptic features and how they should evolve over the forecast period. Example: “The surface low is forecast to deepen as it moves east into AR.”

## **Detailed Forecast Information**

Goes into more regional-focused detail regarding the severe weather potential. Discusses how the convective environment should evolve, convective modes, trends, main hazards, etc...

## **Confidence Communication**

Conveys confidence in the forecast outlined above. Should include the most likely scenario as well as best/worst case potential outcomes and conditional risks.

Example: “A severe storm or two is possible *if* convection can initiate along the dryline before sunset.”



# Anatomy of a Forecast Discussion

## Summary/Bottom Line Up Front

...THERE IS AN ENHANCED RISK OF SEVERE THUNDERSTORMS ACROSS PARTS OF THE MID MISSISSIPPI VALLEY...

### ...SUMMARY...

Scattered severe thunderstorms should develop across the Mid Mississippi Valley late Sunday afternoon. Hail, wind, and some threat for a few tornadoes will spread toward central Illinois during the evening hours.

...Mid Mississippi Valley...

Late-evening model guidance suggests upper ridge will build across the southern Plains and strengthen during the day1 period. This feature will force a notable short-wave trough currently located over WY to top the ridge over eastern SD/NE around 18z before it turns southeast and digs toward the OH Valley by 19/12z. As a result, broad height rises will be noted across much of the western/central US during the first half of the period.

Early this morning, thunderstorm clusters continue across southern IA with more isolated activity into eastern KS. This activity is likely being sustained by a focused LLJ that should move little over the next 36hr, aside from veering toward central IL Sunday evening. Remnants of this convection are expected to be ongoing at the beginning of the period from southeast IA into central IL. Latest guidance suggests weakening is likely after sunrise, though it may not completely dissipate as it propagates southeast. While marginally severe hail/wind could occur with this early-period convection, the primary concern for more significant severe will occur later in the afternoon/evening as influence of the aforementioned short wave approaches.

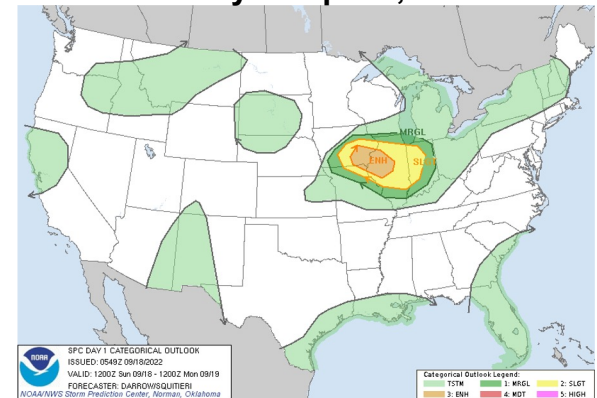
Strong boundary-layer heating is forecast once again across KS where surface temperatures may approach 100F in the central part of the state. Readings into the low-mid 90s are possible across northwest MO. If this occurs convective temperatures may be breached around 22z. There is some concern that isolated convection could develop along the boundary shortly after peak heating but large-scale forcing will not be particularly focused before sunset. However, as the short wave digs southeast, scattered convection will likely develop near the boundary over central IA. Forecast soundings favor supercells, which should mature and dig east-southeast toward a very unstable air mass with MUCAPE in excess of 4000 J/kg. Very steep lapse rates and favorably forced/sheared environment suggest very large hail with the stronger storms. Additionally, while these updrafts may be slightly elevated, low-level shear appears favorable for some risk of tornadoes. Latest HREF guidance supports this scenario with a cluster of supercells evolving over IA and growing upscale as they spread toward central IL during the late evening. Damaging winds may also occur, especially if storm mergers and bow-type features evolve.

## Synopsis/Feature Identification

## Detailed Forecast Information

## Confidence Communication

### Example discussion from 06Z Day 1 Sept 18, 2022





# Content of a Forecast Discussion

Use words to paint a picture of the severe weather forecast!

Each point you make should serve the purpose of adding to the overall picture.

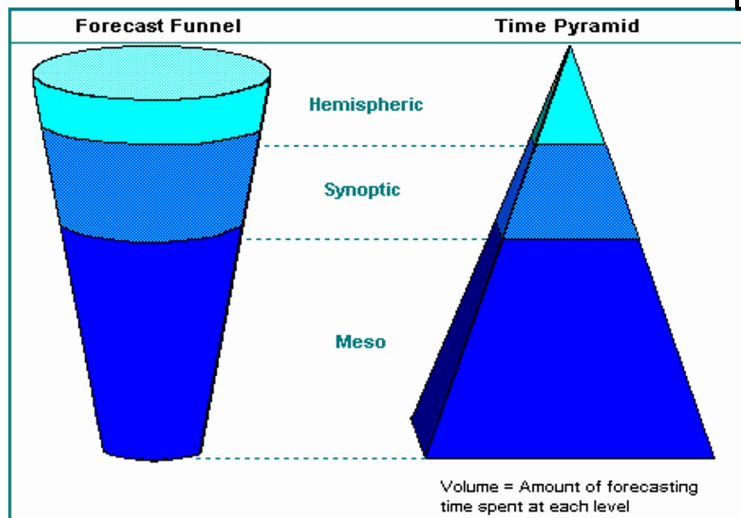




# Content of a Forecast Discussion

Use the forecast funnel to structure your discussion.

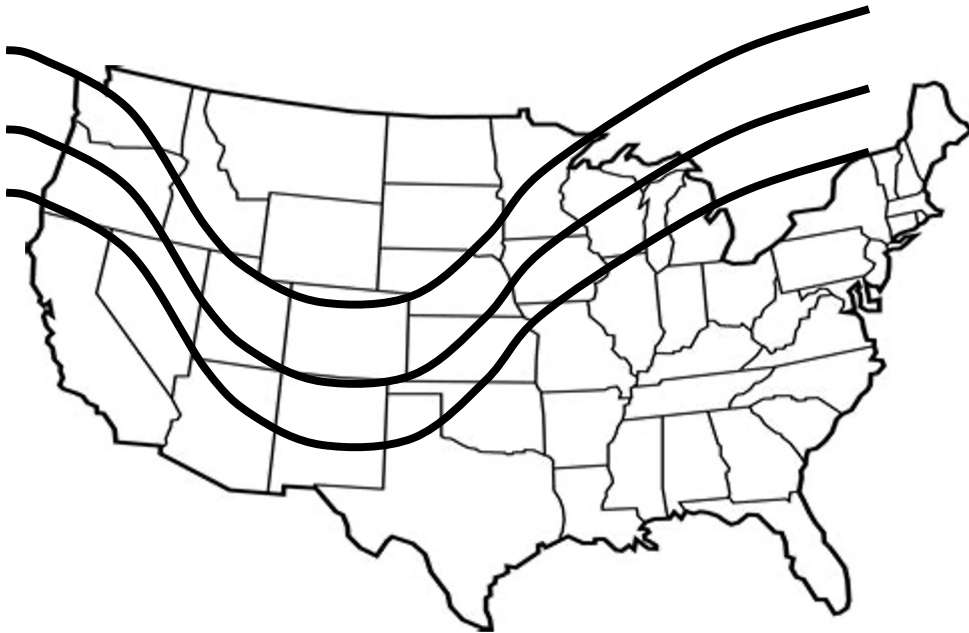
Start at the synoptic scale and work down!





# Content of a Forecast Discussion

A 500 mb trough will move east...



Use words to paint a picture of the severe weather forecast!

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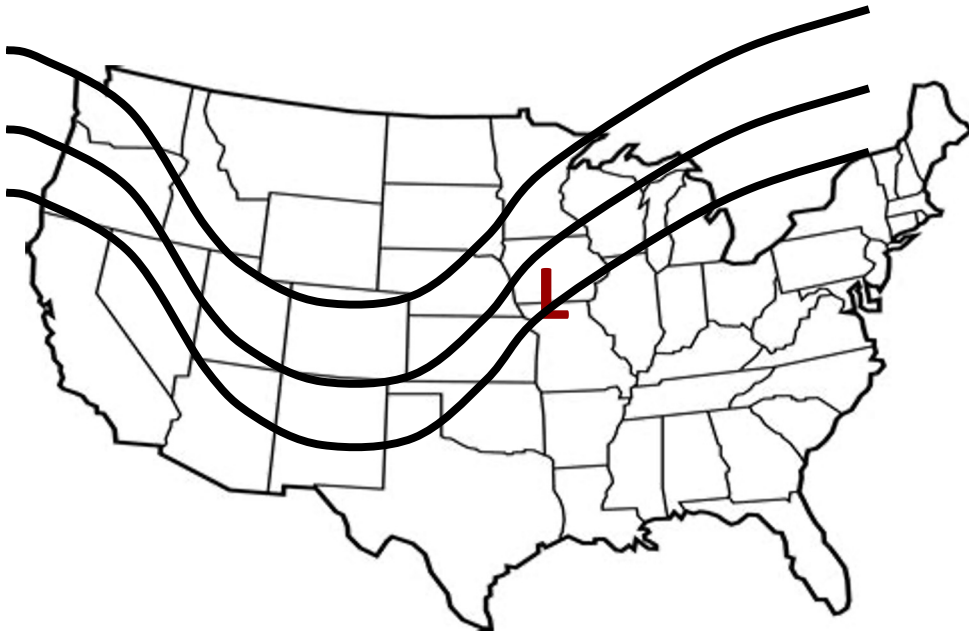




# Content of a Forecast Discussion

A 500 mb trough will move east...

Which will help deepen a low over NE...



Use words to paint a picture of the severe weather forecast!

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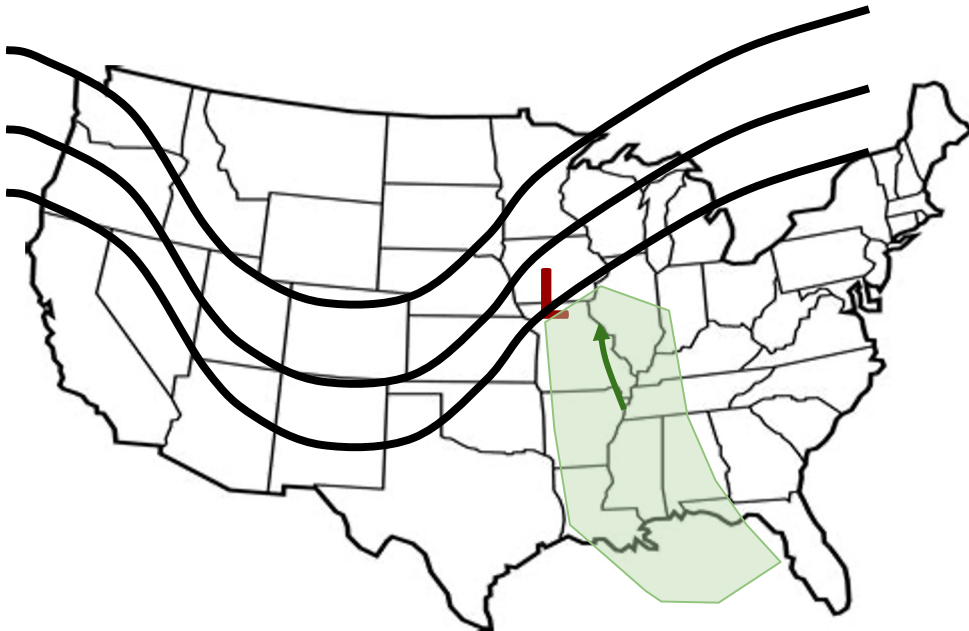


# Content of a Forecast Discussion

A 500 mb trough will move east...

Which will help deepen a low over NE...

In response, southerly winds will increase and draw moisture northward into MO...



Use words to paint a picture of the severe weather forecast!

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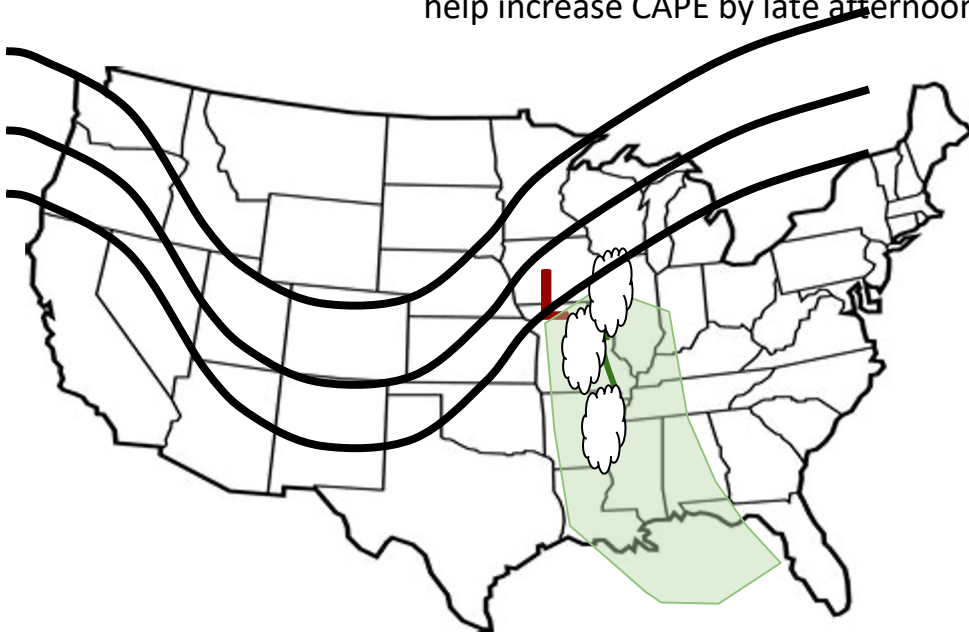
# Content of a Forecast Discussion

A 500 mb trough will move east...

Which will help deepen a low over NE...

In response, southerly winds will increase and draw moisture northward into MO...

The additional moisture and sunny conditions will help increase CAPE by late afternoon...



Use words to paint a picture of the severe weather forecast!

Each point you make should serve the purpose of adding to the overall picture.





# Content of a Forecast Discussion

A 500 mb trough will move east...

Which will help deepen a low over NE...

In response, southerly winds will increase and draw moisture northward into MO...

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**This will increase our thunderstorm chances by 4 PM.**



Use words to paint a picture of the  
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A 500 mb trough will move east...

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help increase CAPE by late afternoon...

**This will increase our thunderstorm chances by 4 PM.**



Excellent Work!

Notice how nicely the discussion flows. Each line builds on the previous sentence and supports the next sentence, leading to main point!





# Content of a Forecast Discussion

Keep in mind:

Use only as many words as necessary!

Calm weather = fewer words.

Impactful weather = more words.





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Valid 291200Z - 301200Z

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Severe thunderstorms capable of producing tornadoes, very large hail, and a few severe wind gusts are expected this afternoon into the overnight period across parts of the lower to mid Mississippi Valley and parts of the Southeast. A few strong tornadoes will be possible.

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A surface low will deepen while tracking from Kansas to the Great Lakes today, accompanied by an eastward advancing upper trough. A strong mid-level jet stream will overspread an intense low-level jet across the OH/TN Valleys into the Southeast. As such, strong deep-layer flow and shear will overlap with a moistening, destabilizing airmass from late morning to early evening from the lower MS Valley east-northeastward. Several strong to intense thunderstorms are expected to organize and promote a relatively robust severe threat, particularly across the Southeast, where regionally higher instability should reside.

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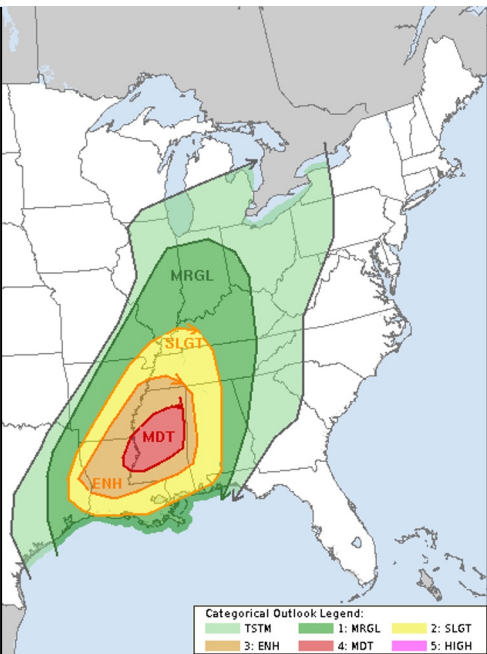
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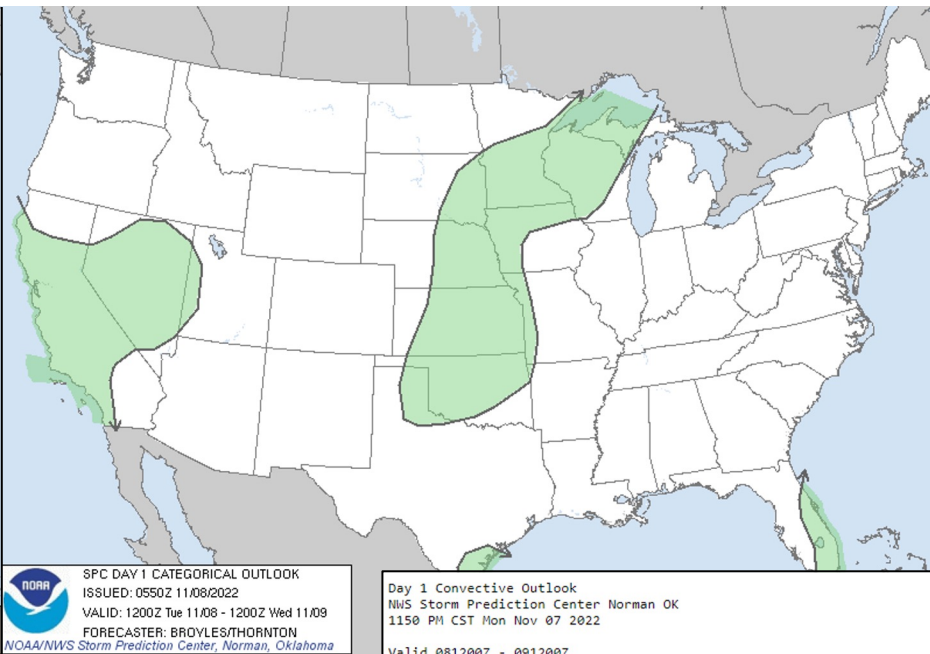
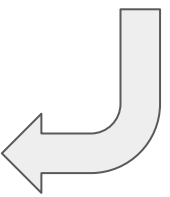
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..Squittieri/Darrow.. 11/29/2022



High Impact



Low Impact



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..Broyles/Thornton.. 11/08/2022



# Group Discussion

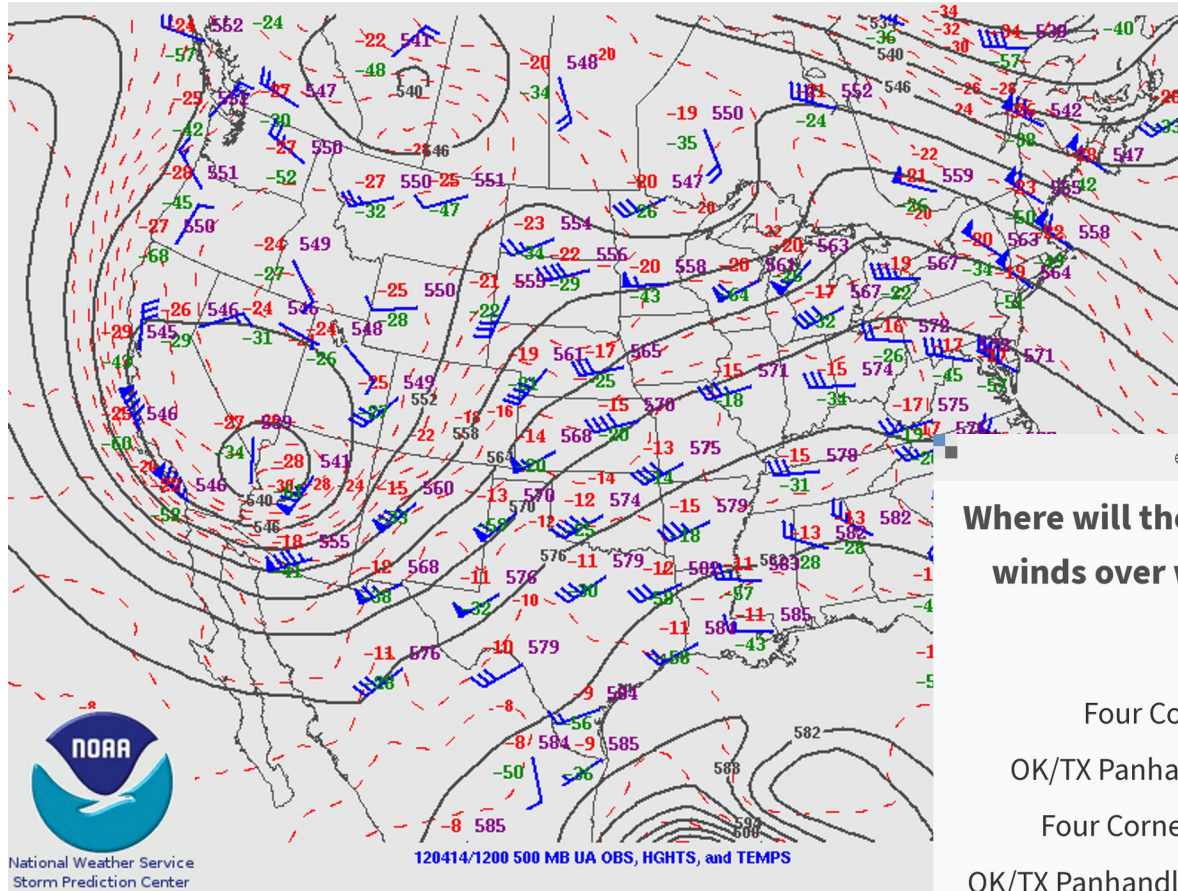
As a class, let's create a forecast discussion as we analyze weather data.



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough		
850 mb Trough/Low		
850 mb Moisture (over west OK/KS)		
Deep layer shear (over west OK/KS)		





## Question #2

Consider the 500 mb chart to the left...

- 1) Where will the low be in 12 hours?
- 2) What will happen to winds at 500 mb over western OK and KS?

When poll is active, respond at [pollev.com/severecclass641](https://pollev.com/severecclass641)

**Where will the 500 mb low be in 12 hours? Will the 500 mb winds over western OK/KS strengthen or weaken in 12 hours?**

Four Corners; Weaken

OK/TX Panhandles; Weaken

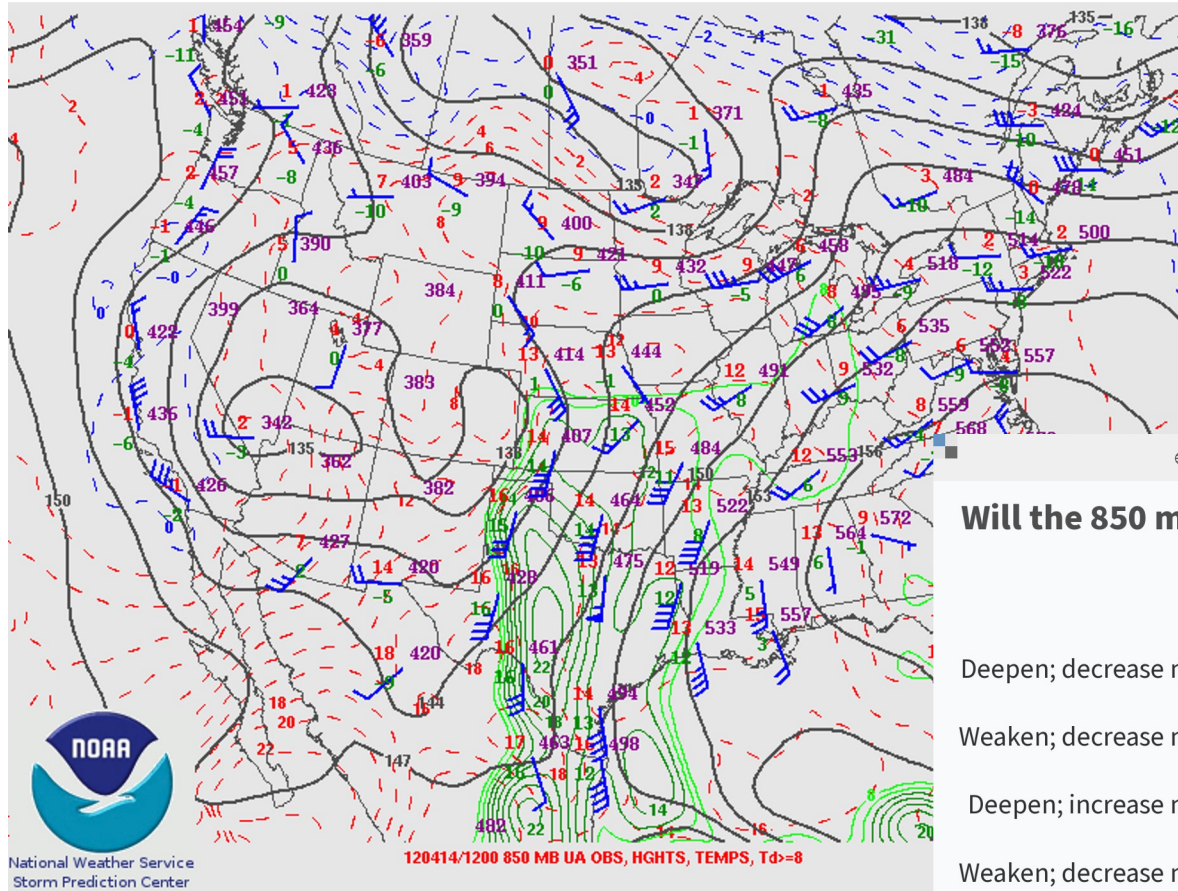
Four Corners; Strengthen

OK/TX Panhandles; Strengthen

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## Question #2

Consider the 850 mb chart to the left...

- 1) Will the 850 mb low deepen?
- 2) What will this due to moisture content over northern OK/KS?

When poll is active, respond at [pollev.com/severecclass641](https://pollev.com/severecclass641)

**Will the 850 mb low deepen? What will this do to moisture content over western OK/KS?**

Deepen; decrease moisture content

Weaken; decrease moisture content

Deepen; increase moisture content

Weaken; decrease moisture content

Powered by [Poll Everywhere](https://poll-everywhere.com/)

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## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough		
850 mb Trough/Low		
850 mb Moisture (over west OK/KS)		
Deep layer shear (over west OK/KS)		



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath
850 mb Trough/Low		
850 mb Moisture (over west OK/KS)		
Deep layer shear (over west OK/KS)		



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA
850 mb Moisture (over west OK/KS)		
Deep layer shear (over west OK/KS)		



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA
850 mb Moisture (over west OK/KS)	Increase	Northerly moisture advection
Deep layer shear (over west OK/KS)		



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA
850 mb Moisture (over west OK/KS)	Increase	Northerly moisture advection
Deep layer shear (over west OK/KS)	Increase	Stronger 500 mb flow moving overhead as trough moves east



## Expected 12z to 00z changes

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA
850 mb Moisture (over west OK/KS)	Increase	Northerly moisture advection
Deep layer shear (over west OK/KS)	Increase	Stronger 500 mb flow moving overhead as trough moves east

**These last two will increase the potential for organized, severe convection!**



## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
500 mb trough	Translate east; minimal deepening	Eastward CVA (shortwave) Weak CAA underneath

Discussion Sentence(s)
The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection.



Feature/Ingredient	Expected Change	Why?
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA

**Write a 1-2 sentence discussion about the 850 mb pattern.**



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## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
850 mb Trough/Low	Deepen; remain in place	DCVA over Rockies, Lee troughing, weak WAA

Discussion Sentence(s)
A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.



Feature/Ingredient	Expected Change	Why?
850 mb Moisture (over west OK/KS)	Increase	Northerly moisture advection
Deep layer shear (over west OK/KS)	Increase	Stronger 500 mb flow moving overhead as trough moves east

Discussion Sentence(s)
<p>12Z analyses also revealed northward moisture advection across western TX and OK. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon.</p> <p>Additionally, deep layer wind shear is expected to increase by late afternoon/early evening as 500 mb flow strengthens in response to the approach of the upper-level trough and its associated jet streak.</p> <p>The combination of increasing moisture as well as deep-layer shear across northwest OK and KS may help enhance the potential for severe weather this afternoon and evening.</p>



# Our Map-Based Discussion

## **Synopsis**

The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection.

A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.

## **Northwest OK and KS Forecast Details**

12Z analyses also revealed northward moisture advection across western TX and OK. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon.

Additionally, deep layer wind shear is expected to increase by late afternoon/early evening as 500 mb flow strengthens in response to the approach of the upper-level trough and its associated jet streak.

The combination of increasing moisture as well as deep-layer shear across northwest OK and KS may help enhance the potential for severe weather this afternoon and evening.



Same day... but now with soundings!  
Expected 12z to 00z changes at OUN

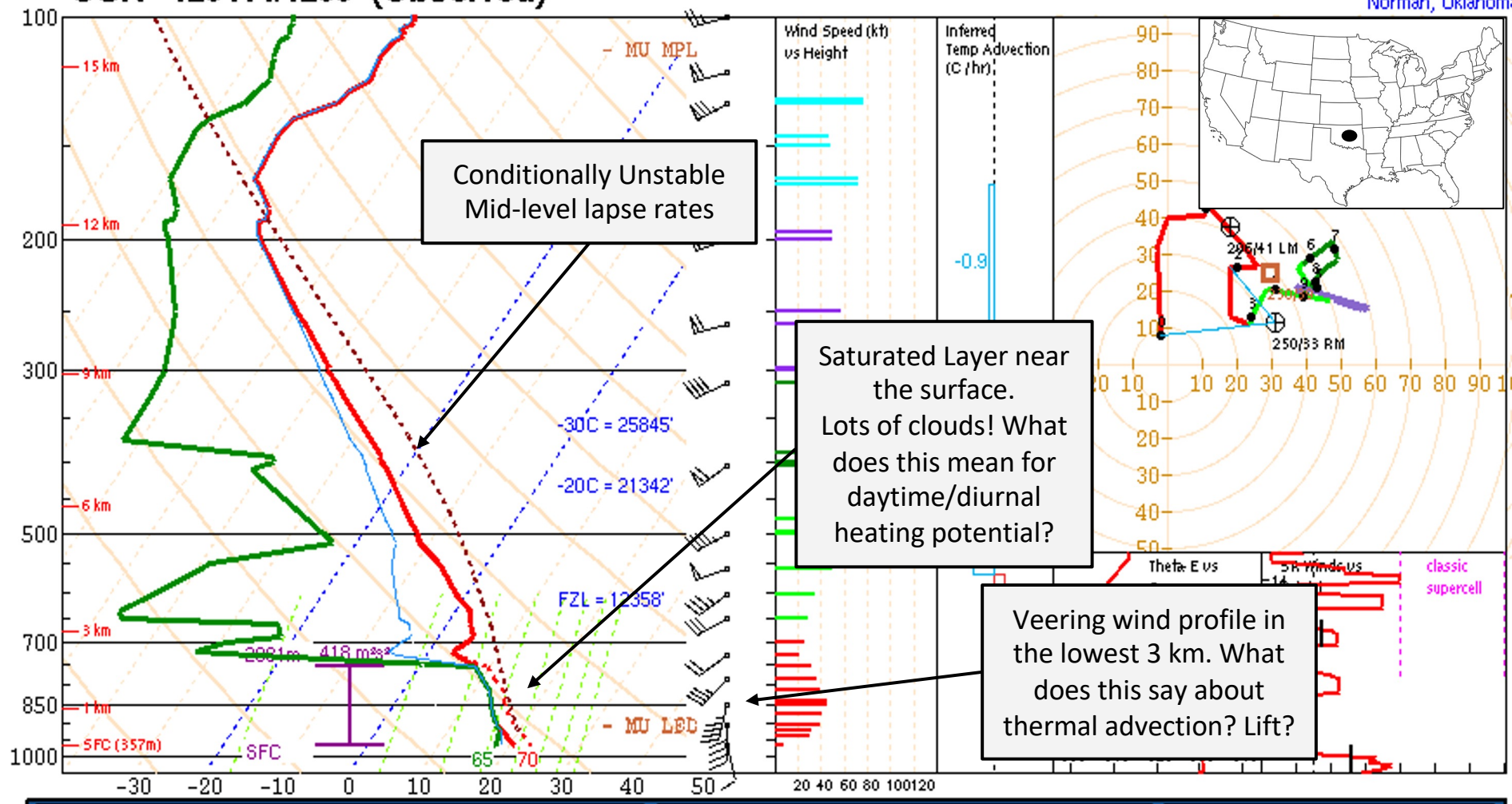
Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates		
Lowest 100 mb mean mixing ratio		

Keep the previous upper-air maps in mind!



# OUN 120414/1200 (Observed)

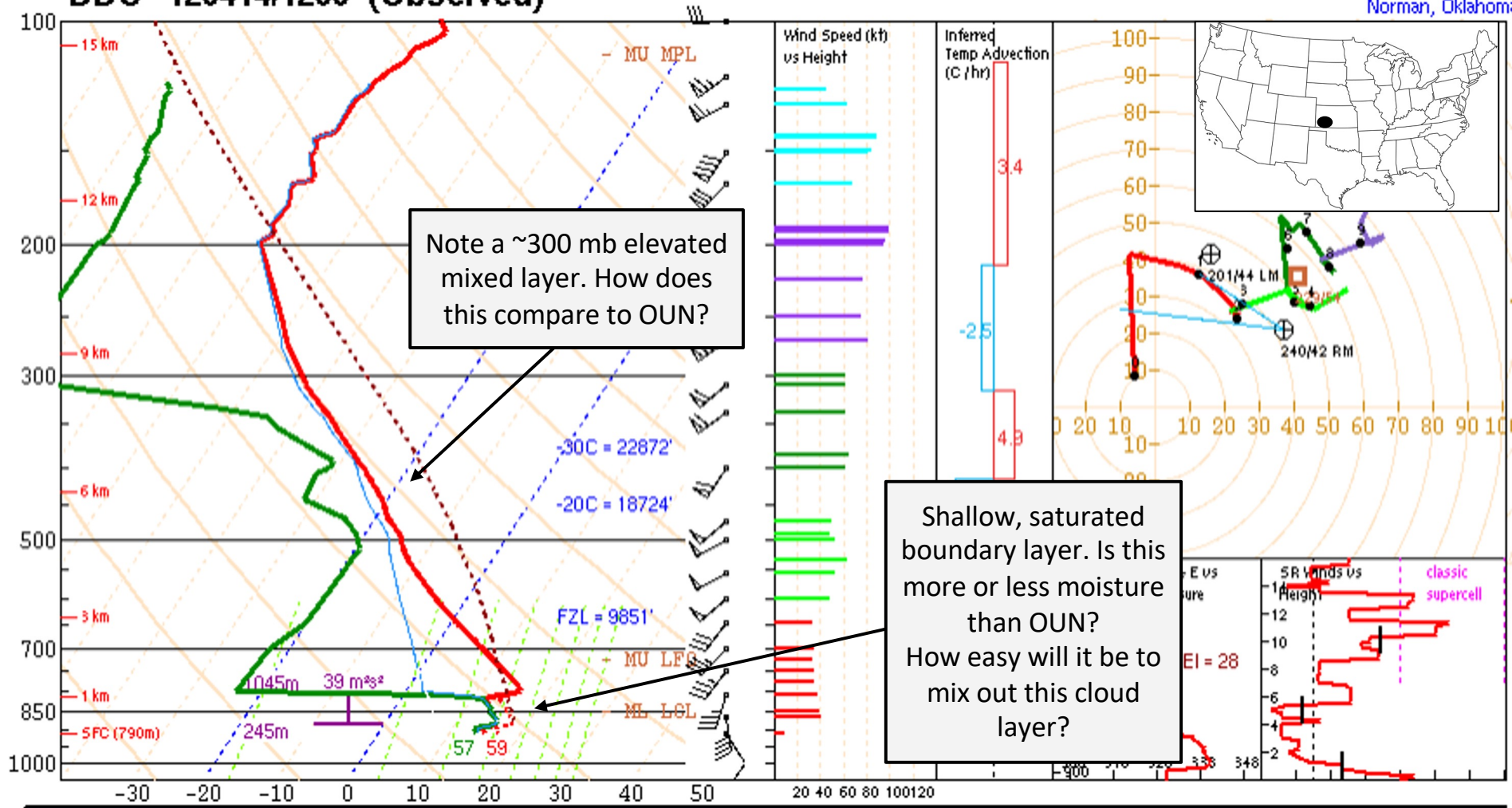
NOAA/NWS Storm Prediction Center  
Norman, Oklahoma





## DDC 120414/1200 (Observed)

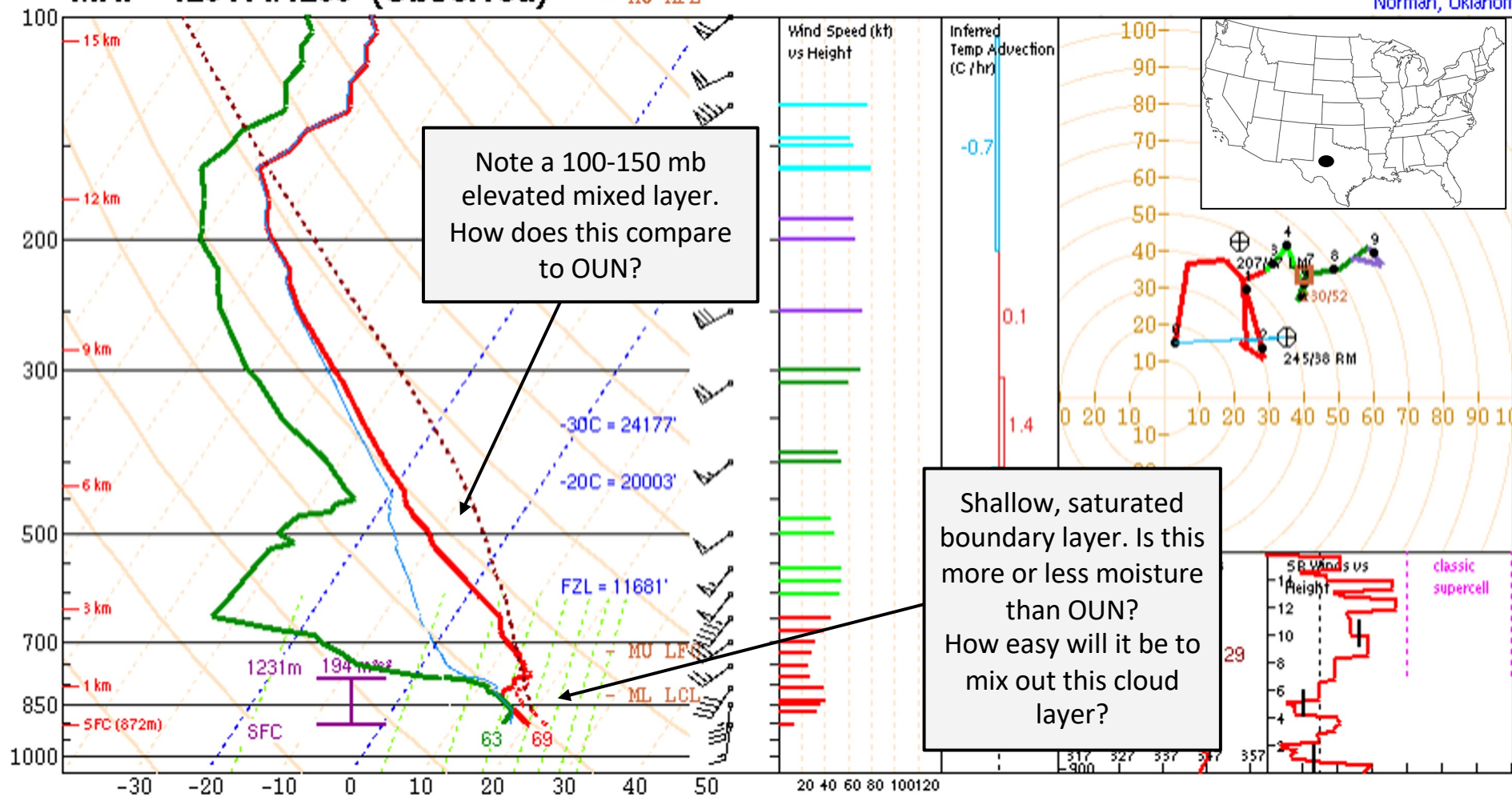
NOAA/NWS Storm Prediction Center  
Norman, Oklahoma





# MAF 120414/1200 (Observed)

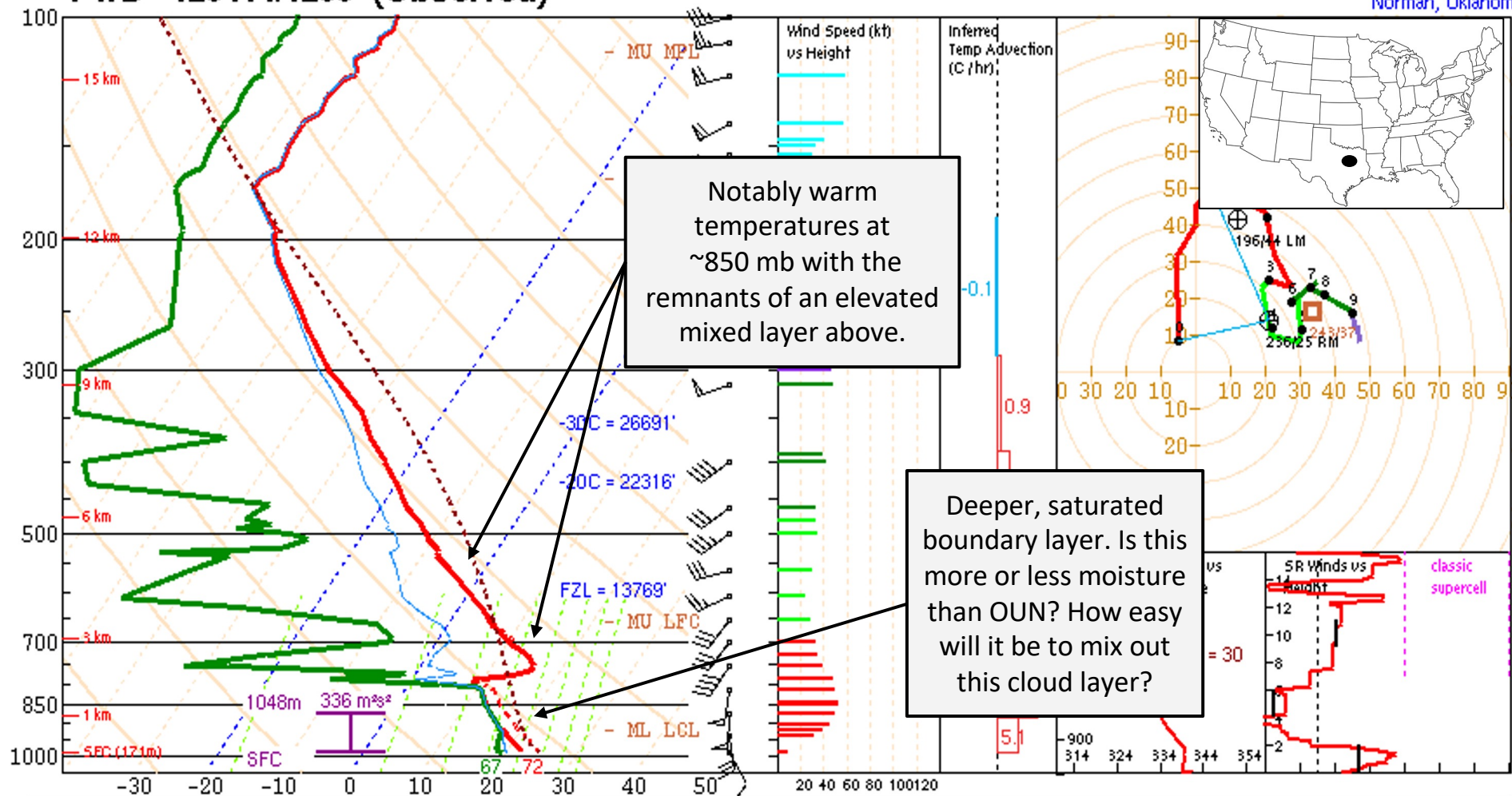
NOAA/NWS Storm Prediction Center  
Norman, Oklahoma





# FWD 120414/1200 (Observed)

NOAA/NWS Storm Prediction Center  
Norman, Oklahoma





## What will happen to the 700-500 mb lapse rates? Will the lowest 100 mb mixing ratio increase or decrease?

Steepen; increase

Steepen; decrease

Become more shallow; increase

Become more shallow; decrease





Same day... but now with soundings!  
Expected 12z to 00z changes at OUN

Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates		
Lowest 100 mb mean mixing ratio		

Keep the previous upper-air maps in mind!



# Same day... but now with soundings!

## Expected 12z to 00z changes at OUN

Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates	Steepen	WAA at 700 mb and neutral temperature advection at 500 mb from MAF. In other words, the eastward advection of an EML.
Lowest 100 mb mean mixing ratio		

Keep the previous upper-air maps in mind!



# Same day... but now with soundings!

## Expected 12z to 00z changes at OUN

Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates	Steepen	WAA at 700 mb and neutral temperature advection at 500 mb from MAF. In other words, the eastward advection of an EML.
Lowest 100 mb mean mixing ratio	Remain about the same	Similar moisture content and depth upstream at FWD moving northward towards OUN. This mitigates the effect of vertical mixing as the boundary layer diurnally deepens!

Keep the previous upper-air maps in mind!



# Same day... but now with soundings!

## Expected 12z to 00z changes at OUN

Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates	Steepen	WAA at 700 mb and neutral temperature advection at 500 mb from MAF. In other words, the eastward advection of an EML.
Lowest 100 mb mean mixing ratio	Remain about the same	Similar moisture content and depth upstream at FWD moving northward towards OUN. This mitigates the effect of vertical mixing as the boundary layer diurnally deepens!

Steepening mid-level lapse rates while maintaining rich boundary-layer moisture will increase buoyancy!



## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
700 - 500 mb lapse rates	Steepen	WAA at 700 mb and neutral temperature advection at 500 mb from MAF. In other words, the eastward advection of an EML.

Discussion Sentence(s)
Morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. This will likely result in steepening lapse rates over OK by 00Z.



## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
Lowest 100 mb mean mixing ratio	Remain about the same	Similar moisture content and depth upstream at FWD moving northward towards OUN. This mitigates the effect of vertical mixing as the boundary layer diurnally deepens!

Discussion Sentence(s)



**Write a 1-2 sentence discussion.**



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## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
Lowest 100 mb mean mixing ratio	Remain about the same	Similar moisture content and depth upstream at FWD moving northward towards OUN. This mitigates the effect of vertical mixing as the boundary layer diurnally deepens!

Discussion Sentence(s)
The 12Z OUN sounding reveals a deep, saturated boundary-layer. Overcast skies, coupled with continued warm air advection within the lowest 3 km, may hinder diurnal heating and boundary layer mixing to a degree, which will help maintain low-level moisture through the day. Any vertical mixing of moisture that does occur will likely be replenished by ample boundary-layer moisture noted in the upstream FWD sounding.



# Our Sounding-Based Discussion

12Z Sounding analysis suggests that the convective environment should become more favorable for severe convection across central OK by 00Z as instability increases.

Morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. This will likely result in steepening lapse rates over OK by 00Z.

The 12Z OUN sounding reveals a deep, saturated boundary-layer. Overcast skies, coupled with continued warm air advection within the lowest 3 km, may hinder diurnal heating and boundary layer mixing to a degree, which will help maintain low-level moisture through the day. Any vertical mixing of moisture that does occur will likely be replenished by ample boundary-layer moisture noted in the upstream FWD sounding.

The combination of steepening lapse rates atop ample boundary-layer moisture will help increase instability by late afternoon.

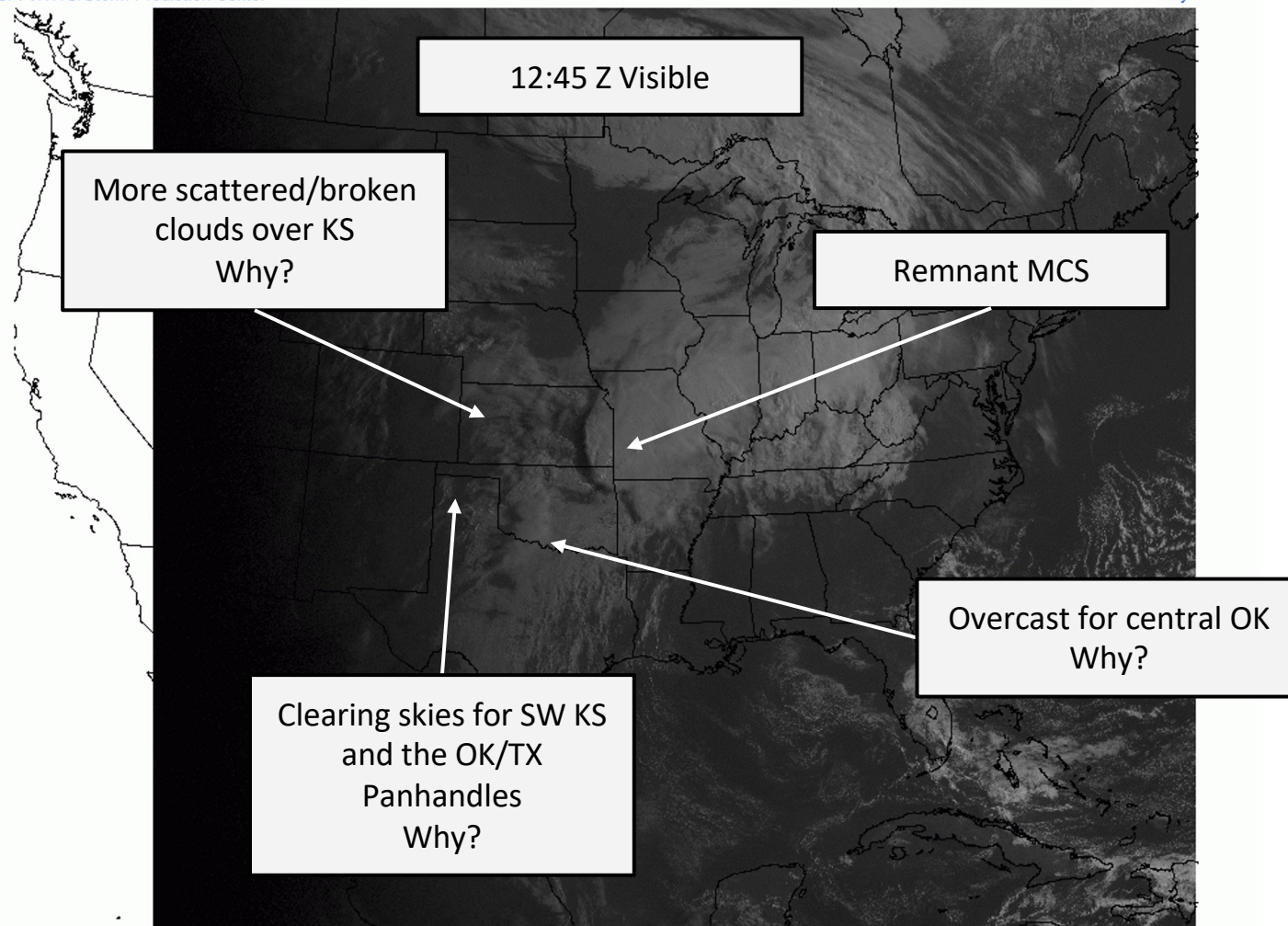


Same day... but now with satellite!  
Expected 12z to 00z changes for OK and KS

Feature/Ingredient	Expected Change	Why?
Cloud Cover		
Diurnal Heating Efficiency		

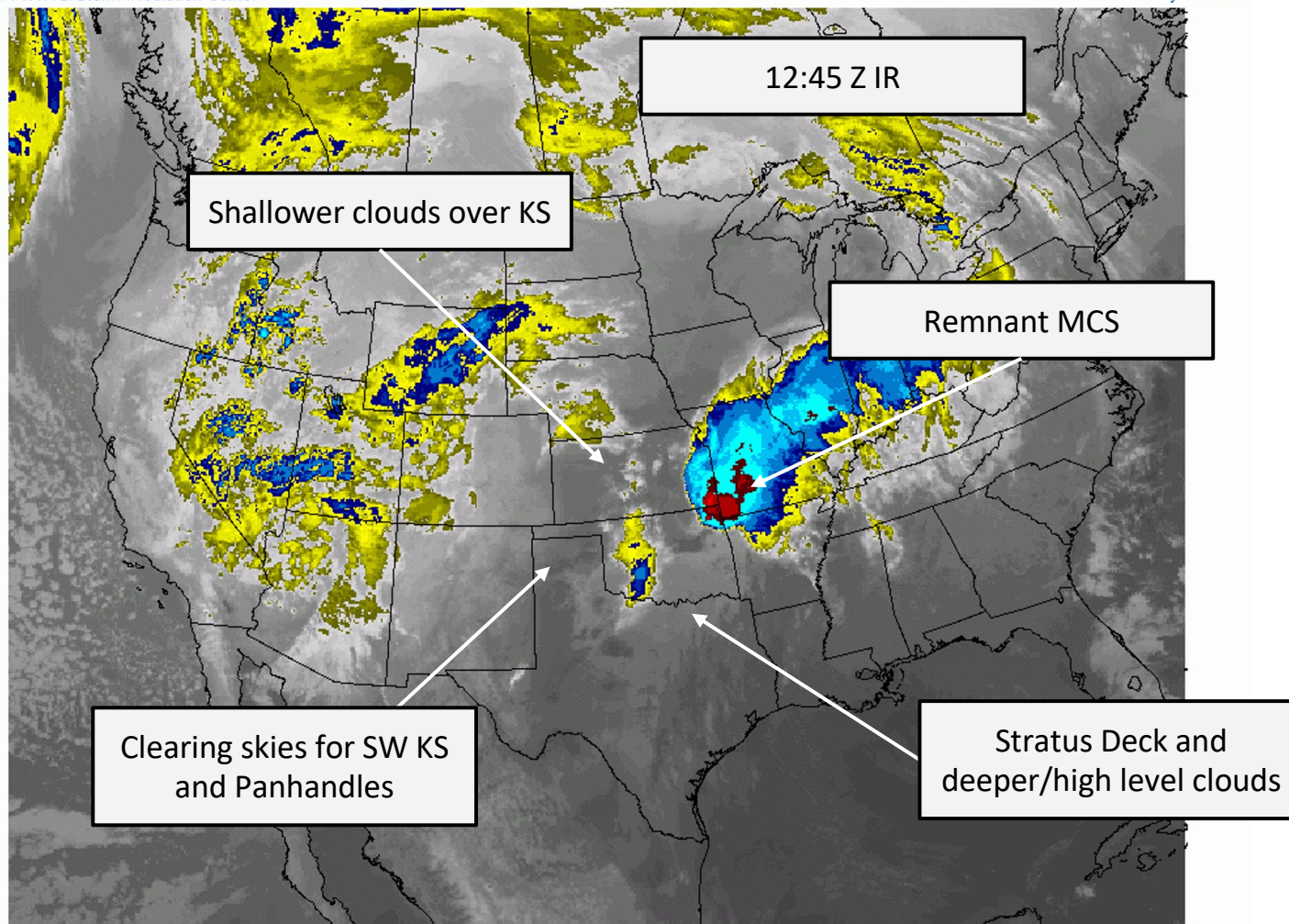
Keep the previous data in mind!





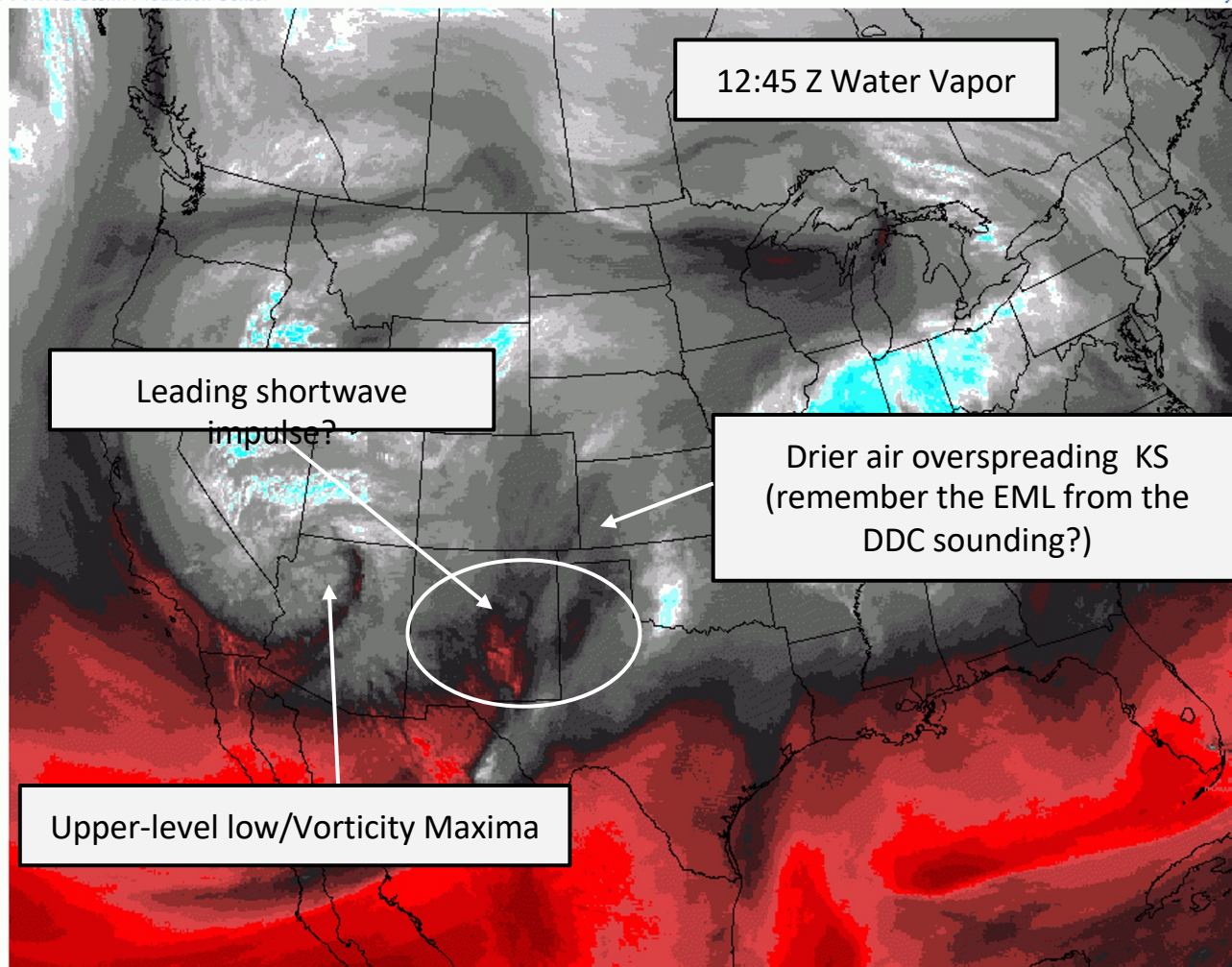
20120414/1245 VISIBL





20120414/1245 INFRAR





20120414/1245 WATEI



## Which of the following do you expect to happen across western OK/KS in the next few hours?

Clearing skies

Increasing Clouds

Strong diurnal warming at the surface

Weak diurnal warming at the surface





Same day... but now with satellite!  
Expected 12z to 00z changes for OK and KS

Feature/Ingredient	Expected Change	Why?
Cloud Cover		
Diurnal Heating Efficiency		

Keep the previous data in mind!



Same day... but now with satellite!

Expected 12z to 00z changes for OK and KS

Feature/Ingredient	Expected Change	Why?
Cloud Cover	Continued clearing for NW OK (until convection develops)	Dry air at mid-upper levels overspreading SW KS (from water vapor imagery) with early signs of partial clearing in visible imagery. Also, the saturated boundary layer at DDC is shallower/easier to mix out by afternoon.
Diurnal Heating Efficiency		

Keep the previous data in mind!



Same day... but now with satellite!  
Expected 12z to 00z changes for OK and KS

Feature/Ingredient	Expected Change	Why?
Cloud Cover	Continued clearing for NW OK (until convection develops)	Dry air at mid-upper levels overspreading SW KS (from water vapor imagery) with early signs of partial clearing in visible imagery. Also, the saturated boundary layer at DDC is shallower/easier to mix out by afternoon.
Diurnal Heating Efficiency	Strong diurnal heating for NW OK.	Fewer clouds will allow for better diurnal warming.

Keep the previous data in mind!



# Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
Cloud Cover	Continued clearing for NW OK (until convection develops)	Dry air at mid-upper levels overspreading SW KS (from water vapor imagery) with early signs of partial clearing in visible imagery. Also, the saturated boundary layer at DDC is shallower/easier to mix out by afternoon.

Discussion Sentence(s)
Recent satellite imagery shows a stratus deck over central OK with decreasing clouds to the north/northwest into NW OK. Drier air aloft overspreading SW KS (per water vapor imagery) and gradual mixing of a shallow moist boundary layer (per the 12 Z DDC sounding) may allow for mostly clear to partly cloudy skies by early afternoon.



## Concepts -> Discussion

Feature/Ingredient	Expected Change	Why?
Diurnal Heating Efficiency	Poor diurnal heating for central OK; better diurnal heating for SW KS.	Cloud cover will likely persist for central OK, fewer clouds are expected for SW KS.

Discussion Sentence(s)
Mostly clear to partly cloudy skies across northwest OK into KS will allow for strong daytime heating and aid in destabilization by late afternoon.

Here we tie in the observed trends directly into our severe weather forecast!



**Write a 3-5 sentence discussion.**



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# Our Satellite-Based Discussion

Recent satellite imagery shows a stratus deck over central OK with decreasing clouds to the north/northwest into NW OK. Drier air aloft overspreading SW KS (per water vapor imagery) and gradual mixing of a shallow moist boundary layer (per the 12 Z DDC sounding) may allow for mostly clear to partly cloudy skies by early afternoon.

Mostly clear to partly cloudy skies across northwest OK into KS will allow for strong daytime heating and aid in destabilization by late afternoon.



# Our Combined Discussion

## Synopsis

The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection. A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.

Information from 500 mb and 850 mb charts

## Northwest OK Forecast Details

12Z analyses also revealed northward moisture advection across western TX and OK. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon. Additionally, deep layer wind shear is expected to increase by late afternoon/early evening as 500 mb flow strengthens in response to the approach of the upper-level trough and its associated jet streak. The combination of increasing moisture as well as deep-layer shear across northwest OK and KS may help enhance the potential for severe weather this afternoon and evening.

12Z Sounding analysis suggests that the convective environment should become more favorable for severe convection across central OK by 00Z as instability and deep-layer shear increase. Morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. This will likely result in steepening lapse rates over OK by 00Z. The 12Z OUN sounding reveals a deep, saturated boundary-layer. Overcast skies, coupled with continued warm air advection within the lowest 3 km, may hinder diurnal heating and boundary layer mixing to a degree, which will help maintain low-level moisture through the day. Any vertical mixing of moisture that does occur will likely be replenished by ample boundary-layer moisture noted in the upstream FWD sounding. The combination of steepening lapse rates atop ample boundary-layer moisture will help increase instability by late afternoon. Mid to upper-level winds are forecast to strengthen through the afternoon and evening as stronger flow associated with the approaching upper-level trough across the West shifts east through the day. Given the southerly low-level flow noted in the 12 UTC OUN sounding (which will likely be maintained, if not augmented, as surface pressure falls to the north/northwest), this will likely result in an increase in 0-6 km bulk shear over central OK.

Sounding Information

Recent satellite imagery shows a stratus deck over central OK with decreasing clouds to the north/northwest into KS. Continued low to mid-level warm advection within a moist boundary layer should maintain cloud cover for much of the day for central OK, while drier air aloft overspreading SW KS (per water vapor imagery) and gradual mixing of a shallow moist boundary layer (noted in the 12 Z DDC sounding) may allow for mostly clear to partly cloudy skies. Persistent cloud cover over central OK should limit the degree of daytime heating. However, mostly clear to partly cloudy skies further north/northwest into KS will allow for at least modest daytime heating and aid in destabilization by late afternoon.

Satellite Information



# Our Refined Discussion

## Synopsis

The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection. A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.

## Northwest OK Forecast Details

Northward low to mid-level moisture advection is noted across TX and central OK in 12Z analyses and regional soundings. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon. This moist, warm air advection regime over OK may help maintain boundary-layer moisture and overcast skies (noted in morning visible satellite imagery), which could limit the degree of daytime heating. Further north/northwest into KS, the 12 DDC sounding revealed a saturated, but shallow, boundary-layer that may be more susceptible to diurnal mixing. Visible and IR imagery support this idea by showing a shallow, scattered cloud deck. Additionally, morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. Drier air associated with this EML is noted in morning water vapor imagery, and will likely result in steepening lapse rates over OK by 00Z. The net result of these effects will be to promote increasing instability across northwest OK into KS with modest increases in instability further south into central OK.

500 mb flow is expected to strengthen through the day in response to the approach of the upper-level trough and its associated jet streak. Given the southerly low-level flow noted in the 12 UTC OUN and DDC soundings (which will likely be maintained, if not augmented, as surface pressure falls to the northwest), this will likely result in an increase in 0-6 km bulk shear over OK and KS. As a result, wind profiles will become more favorable for supporting severe convection heading into the afternoon and evening hours.

Here we simply consolidated similar topics into the same sentence.

Remember: There's no need to say the same thing twice in two different places!



# Our Refined Discussion

## Summary

Severe thunderstorms appear likely this afternoon and evening across northwest OK.

← Let's add in a summary!

## Synopsis

The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection. A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.

## Northwest OK Forecast Details

Northward low to mid-level moisture advection is noted across TX and central OK in 12Z analyses and regional soundings. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon. This moist, warm air advection regime over OK may help maintain boundary-layer moisture and overcast skies (noted in morning visible satellite imagery), which could limit the degree of daytime heating. Further north/northwest into KS, the 12 DDC sounding revealed a saturated, but shallow, boundary-layer that may be more susceptible to diurnal mixing. Visible and IR imagery support this idea by showing a shallow, scattered cloud deck.

Additionally, morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. Drier air associated with this EML is noted in morning water vapor imagery, and will likely result in steepening lapse rates over OK by 00Z. The net result of these effects will be to promote increasing instability across northwest OK into KS with modest increases in instability further south into central OK.

500 mb flow is expected to strengthen through the day in response to the approach of the upper-level trough and its associated jet streak.

Given the southerly low-level flow noted in the 12 UTC OUN and DDC soundings (which will likely be maintained, if not augmented, as surface pressure falls to the northwest), this will likely result in an increase in 0-6 km bulk shear over OK and KS. As a result, wind profiles will become more favorable for supporting severe convection heading into the afternoon and evening hours.



# Our Refined Discussion

## Summary

Severe thunderstorms appear likely this afternoon and evening across northwest OK.

## Synopsis

The 500 mb trough noted in the 12Z analysis over southern Nevada is forecast to translate east through the day into the Four Corners region by 00Z with minimal deepening due to strong cyclonic vorticity advection atop of weak low to mid-level cold advection. A weak lee trough is noted at 850 mb from eastern CO southward into northeast NM. This lee trough will deepen through the day over eastern CO as strong differential cyclonic vorticity advection aloft overspreads the region in tandem with an increasing zonal flow component over the central Rockies.

## Northwest OK Forecast Details

Northward low to mid-level moisture advection is noted across TX and central OK in 12Z analyses and regional soundings. This should help augment low to mid-level moisture across northwest OK and western to central KS by late afternoon. This moist, warm air advection regime over OK may help maintain boundary-layer moisture and overcast skies (noted in morning visible satellite imagery), which could limit the degree of daytime heating. Further north/northwest into KS, the 12 DDC sounding revealed a saturated, but shallow, boundary-layer that may be more susceptible to diurnal mixing. Visible and IR imagery support this idea by showing a shallow, scattered cloud deck.

Additionally, morning regional soundings show steep mid-level lapse rates within an EML over west TX and SW KS that will likely overspread into OK and central KS within a west/southwesterly flow regime within the 700-500 mb layer. Drier air associated with this EML is noted in morning water vapor imagery, and will likely result in steepening lapse rates over OK by 00Z. The net result of these effects will be to promote increasing instability across northwest OK into KS with modest increases in instability further south into central OK.

500 mb flow is expected to strengthen through the day in response to the approach of the upper-level trough and its associated jet streak.

Given the southerly low-level flow noted in the 12 UTC OUN and DDC soundings (which will likely be maintained, if not augmented, as surface pressure falls to the northwest), this will likely result in an increase in 0-6 km bulk shear over OK and KS. As a result, wind profiles will become more favorable for supporting severe convection heading into the afternoon and evening hours.

## Confidence

Although cloud cover is forecast to persist across central OK, the environment will still be conditionally supportive for convective given steepening mid-level lapse rates and increasing deep-layer shear.

A severe storm or two may be possible if sufficient lift moves over the region.

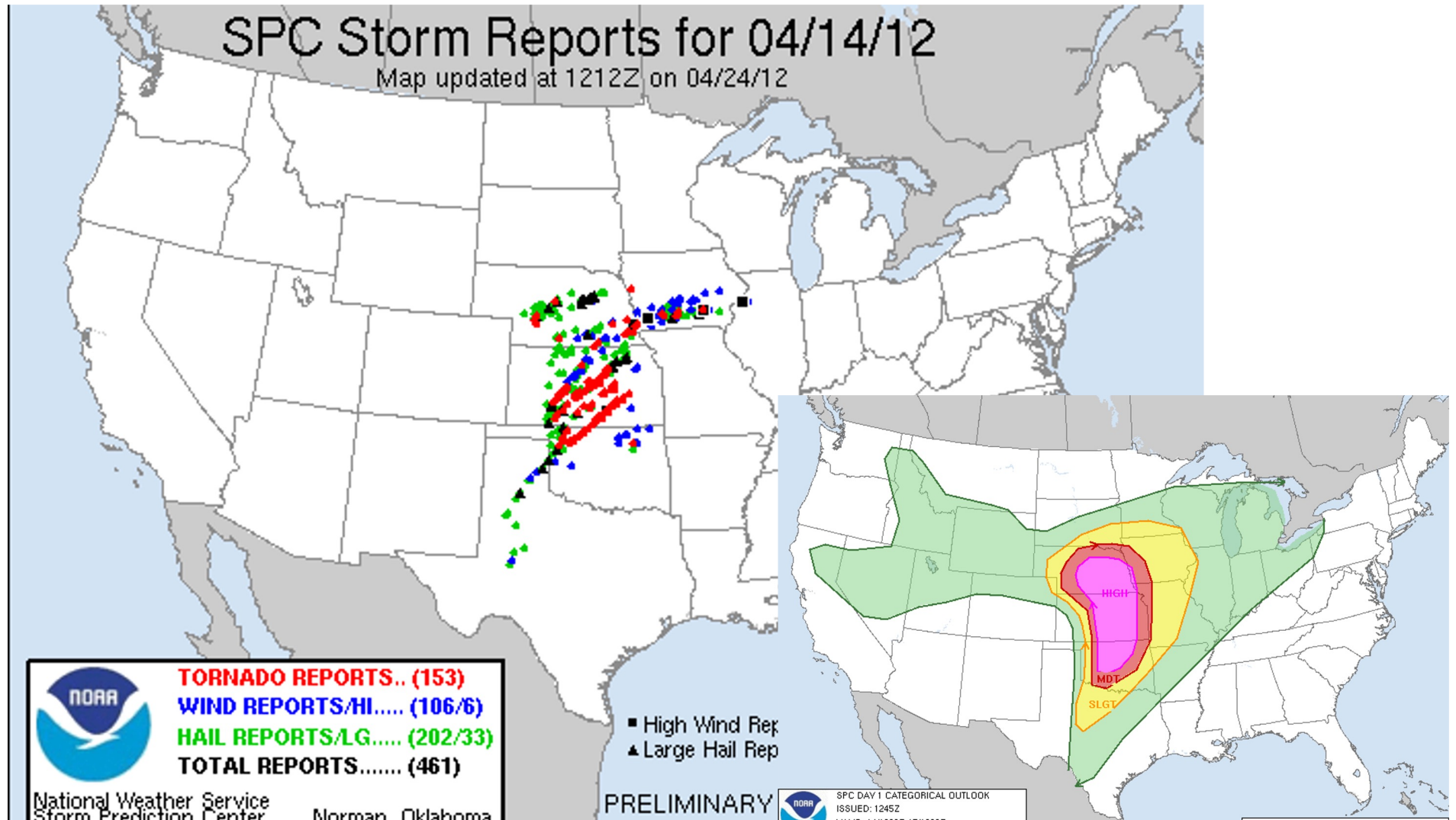
Let's add in a confidence section! (It is relatively short here for brevity.)





# SPC Storm Reports for 04/14/12

Map updated at 1212Z on 04/24/12





# A Few Pointers

- Avoid spelling and grammar mistakes.
  - Poor spelling and grammar reflects poorly on your office and erodes your credibility.
- Avoid using subjective descriptions.
  - Instead of saying “insanely high MLCAPÉ” say “4000-5000 J/kg MLCAPÉ”. Keep it scientific!
- Always have someone else proofread your discussion.
- Read more discussions!
  - The more you read, the better you’ll write!
- Know your audience!

Keep these in mind!





# Forecast Journals

Your task:

- Use observations and short/long range models to create a series of SPC-style Day 1 convective outlooks.
- Each journal will have three parts:
  1. An SPC-style outlook graphic (categorical only, no individual hazards required)
  2. A Day 1 forecast discussion.
  3. Post event verification and discussion
- Your forecast journal will NOT be graded on forecast accuracy, but WILL be graded on:
  - Meteorological concepts and consistency
  - Incorporation of various observation networks (no model-only forecasts)
  - Spelling and grammar

**Please see the online rubric for further instructions and expectations.**