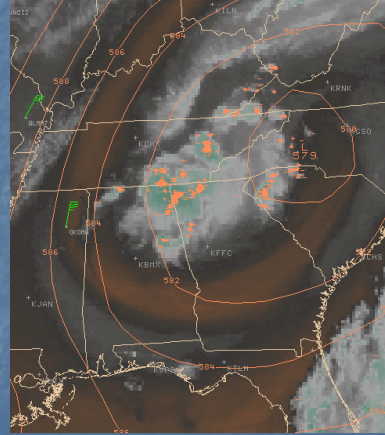
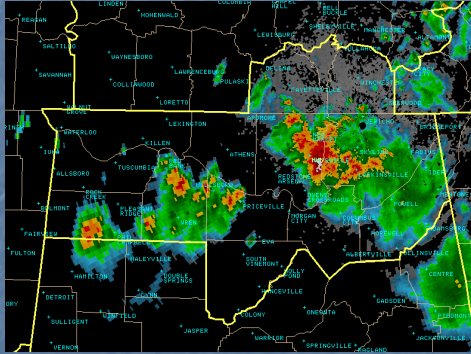


June 20th, 2005

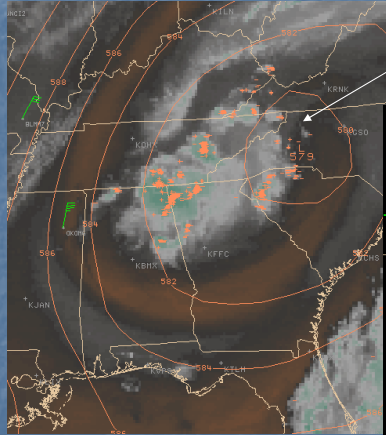
Severe Weather Review



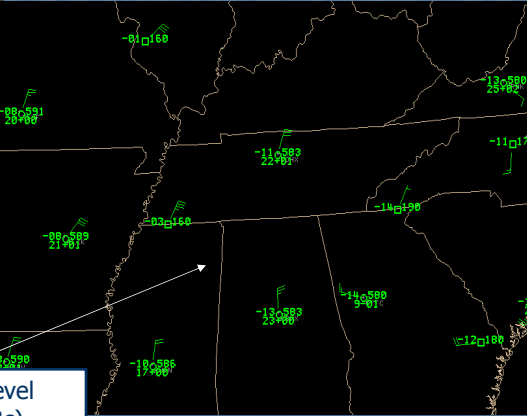
Overview

- Pre-storm Environment
- Thermodynamic and Kinematics
- Outlooks and Forecasts
- Radar Analysis
- Summary

The "Big Picture"

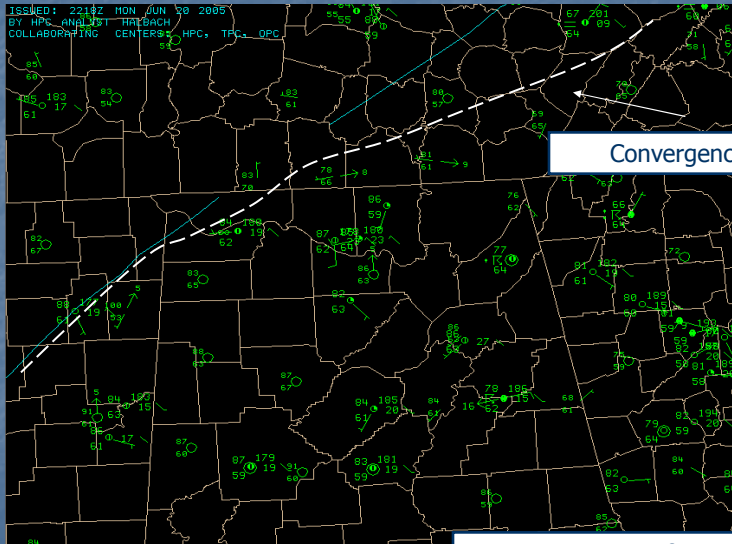


Upper Low across the Appalachians



Unseasonably cool mid level temperatures (-11 to -13c)

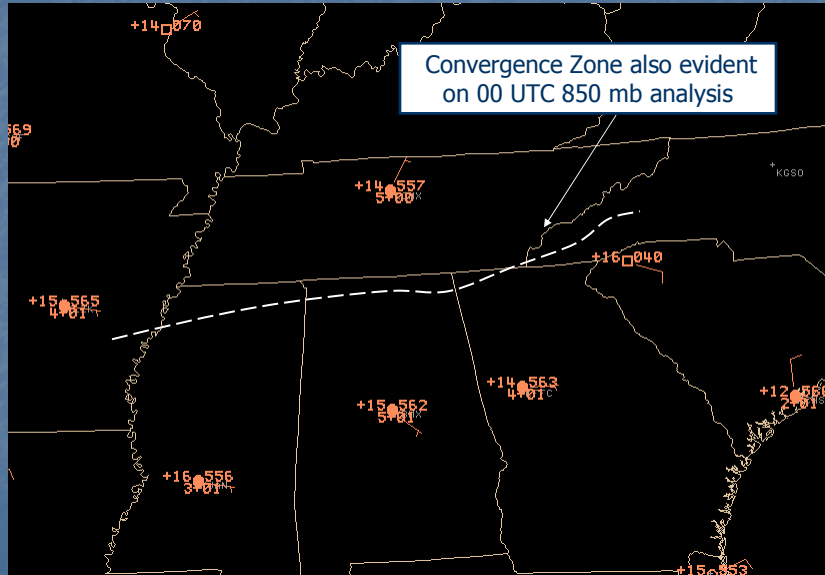
Narrowing the Focus



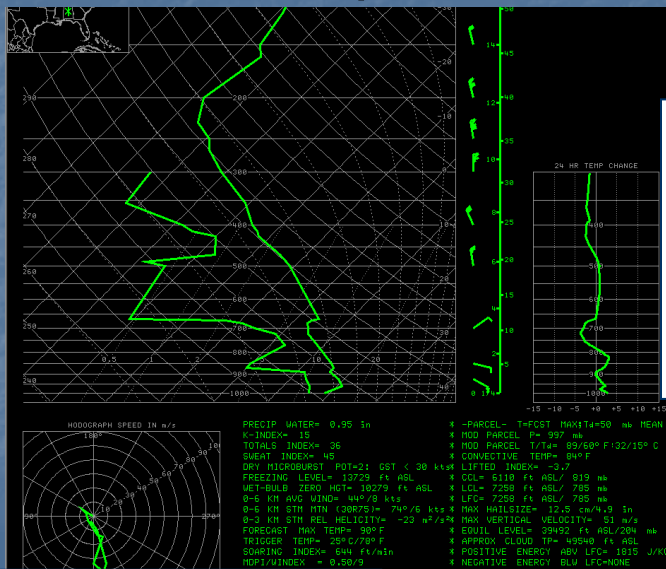
Convergence Zone

2100 UTC Surface Analysis

Narrowing the Focus

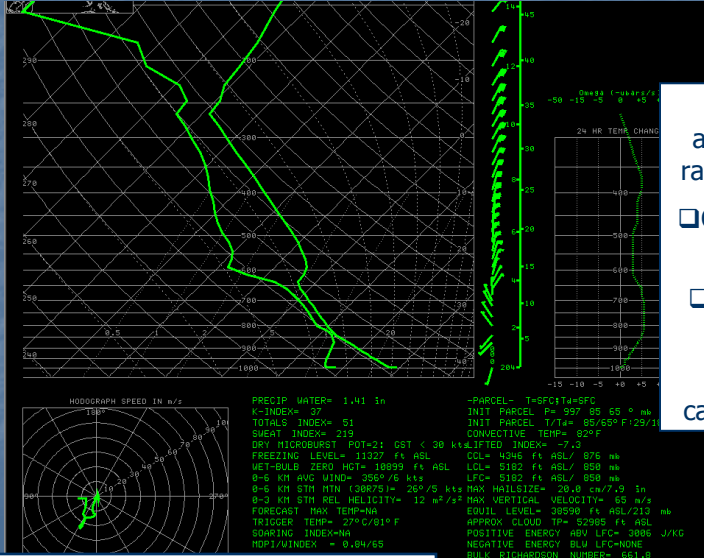


Thermodynamic Structure



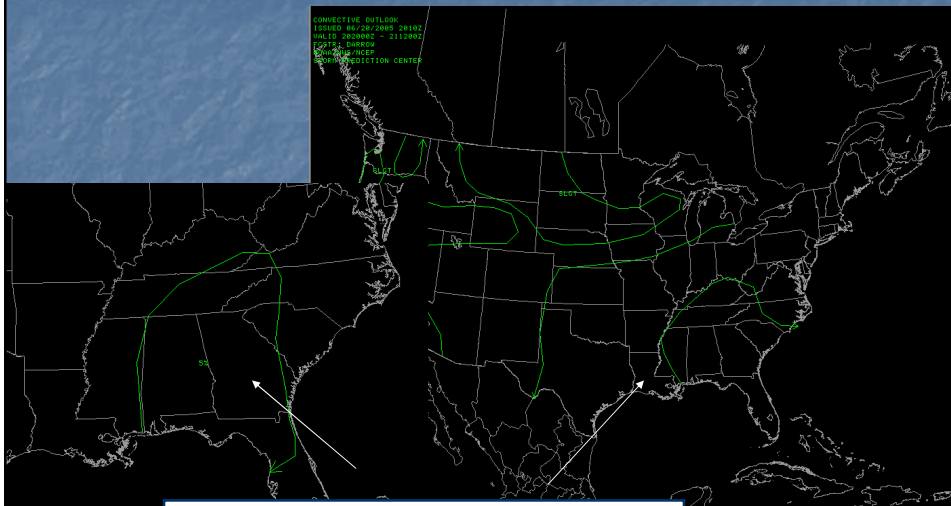
- ▣ Steep Mid level lapse rates (800 – 500 mb)
- ▣ Dry air above 700 mb
- ▣ Adequate moisture below 850 mb

Thermodynamic Structure



- Near dry adiabatic lapse rates sfc-600 mb
- CAPE ~3 kJ/kg; LI -7
- Storm motion only 5 kts
- WINDEX calculation of 65

SPC Outlooks



General Thunder; Severe Wind Threat 5%

Day One Convectv Outlook Mon 20:00Z 20-Jun-05

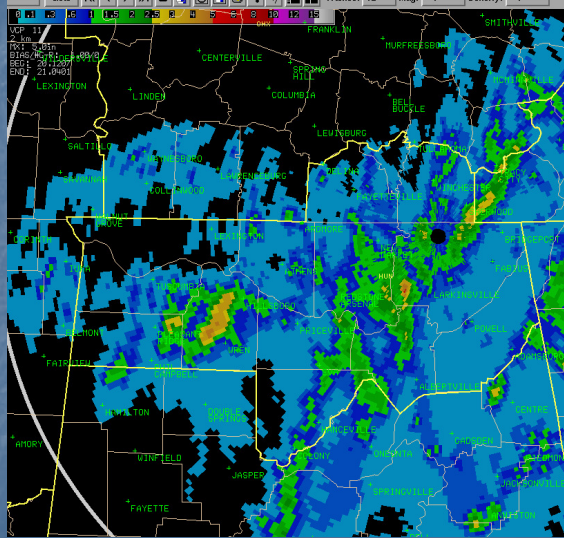
Our Forecasts and Outlooks

- 4 AM Forecast Included:
 - An Isolated Shower or Thunderstorm Possible (20%) for Northeast Alabama and Franklin TN with no precipitation mentioned elsewhere
- An update was completed at 102 PM to include 20% chance of showers and thunderstorms areawide
- 4 PM package included 20 PoPs areawide

Our Forecasts and Outlooks

- The early morning HWO mentioned “a stronger storm or two will be capable of producing brief heavy downpours and gusty winds”
- The midday update ramped things up slightly, including the mention of small hail

What Happened

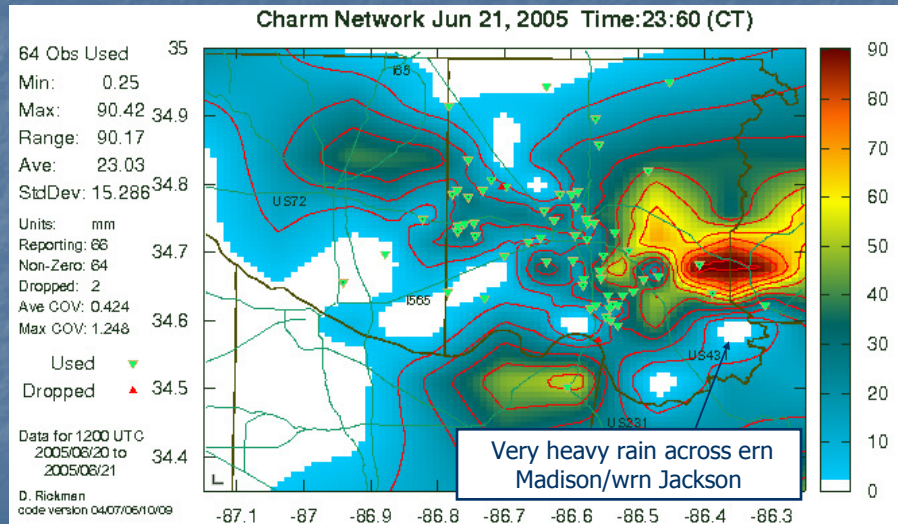


- Heavy rainfall fell in several locations across the CWA
- Areal coverage of measurable precip ~50%**
- 6 reports of wind damage
- 4 reports of large hail
- One report of hail up to golf ball size

A Few Rain Reports

- Meridianville – 0.84"
- Winchester – 0.87"
- Cullman Coop – 1.17"
- Hytop – 1.21"
- Lim Rock – 1.18"
- Chase – 1.56"
- North Huntsville – 0.91"
- Guntersville – 1.28"
- Madison – 1.16"

CHARM Analysis



Product Summary

- Summary of products issued during the event...
 - 6 Significant Weather Alerts
 - 2 Flash Flood Warnings
 - 7 Severe Thunderstorm Warnings (for 9 counties)
 - 11 Severe Weather Statement
 - An Event Local Storm Report

Verification Information

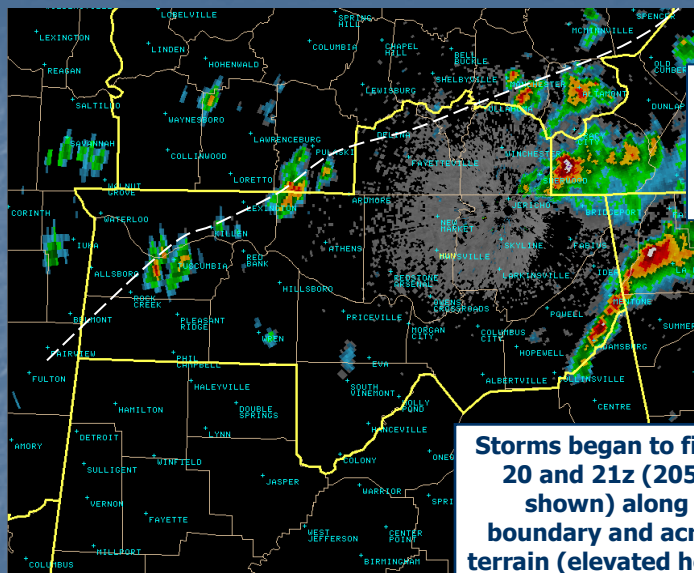
- Preliminary Information
 - No Flood Reports Received
 - 0 for 2 on FFWs (100% FAR)
 - 11 Severe Weather Reports (some county duplicates)
 - 4 for 9 on SVRs
 - FAR 56%
 - Average Lead Time – 18 minutes

Verification Information

- Three missed events occurred...
 - 700 PM - 1 mile south of Moulton in Lawrence County (power lines down)
 - Report looks questionable based on radar data
 - 730 PM – Joppa in Cullman County (numerous trees blown down)
 - 740 PM – 2 miles west of Arab in Marshall County (1" Hail)
- We will investigate these storms further during the review

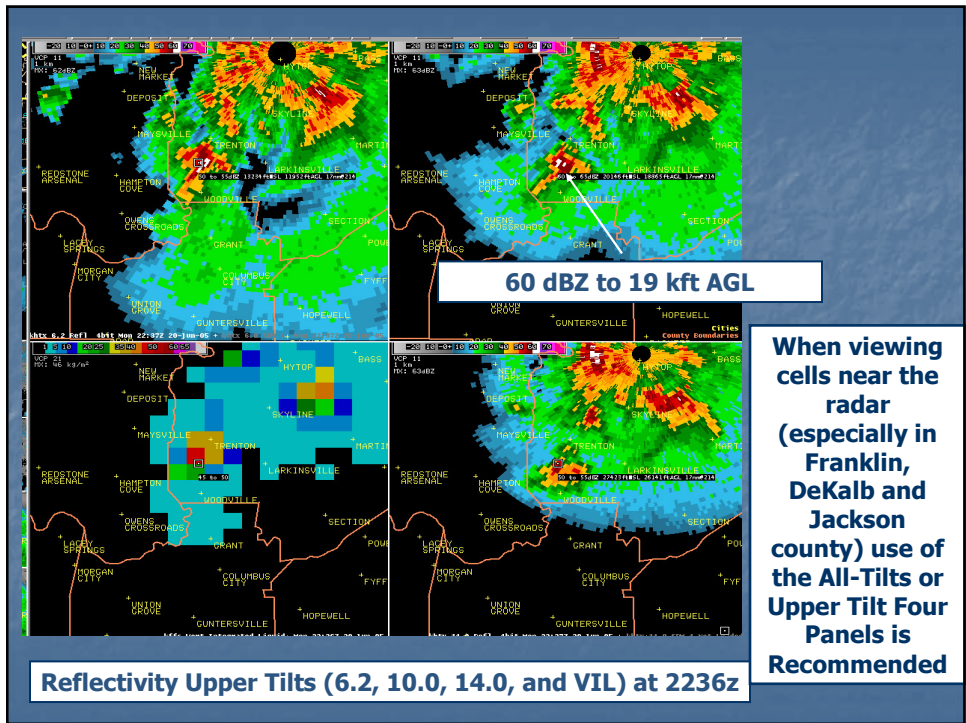
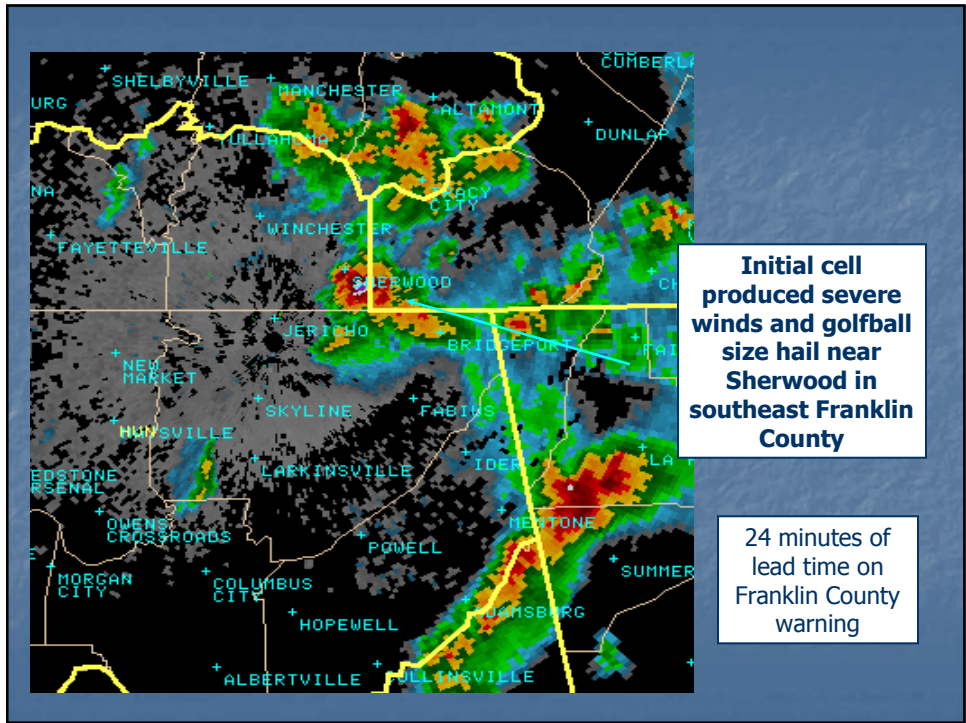
Radar Summary

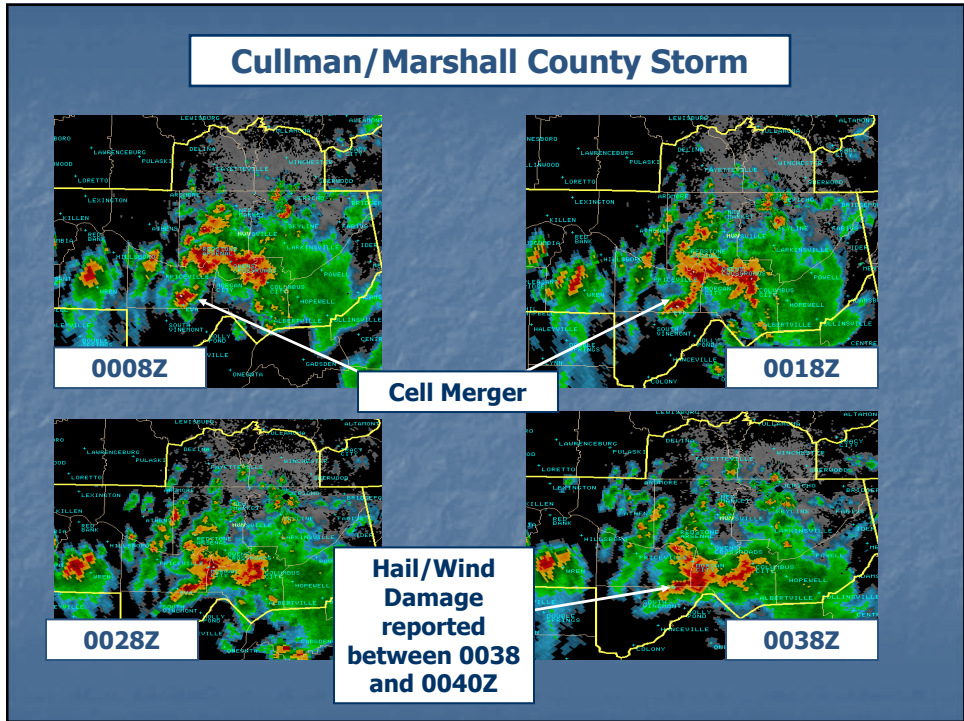
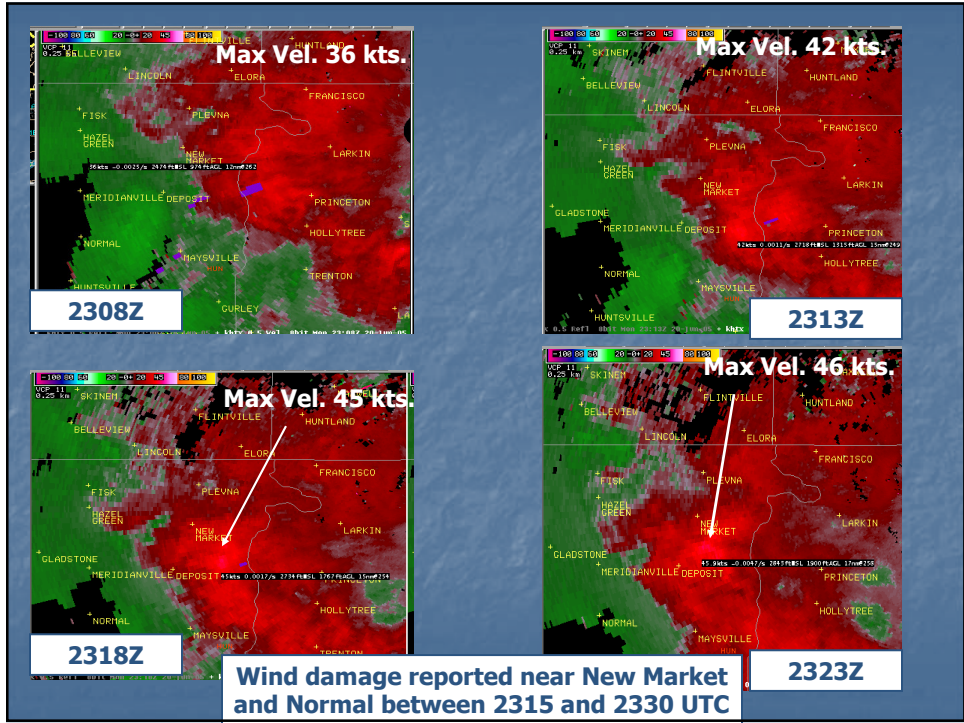
- Now let's look at some specifics concerning the evolution of the storms on this particular day



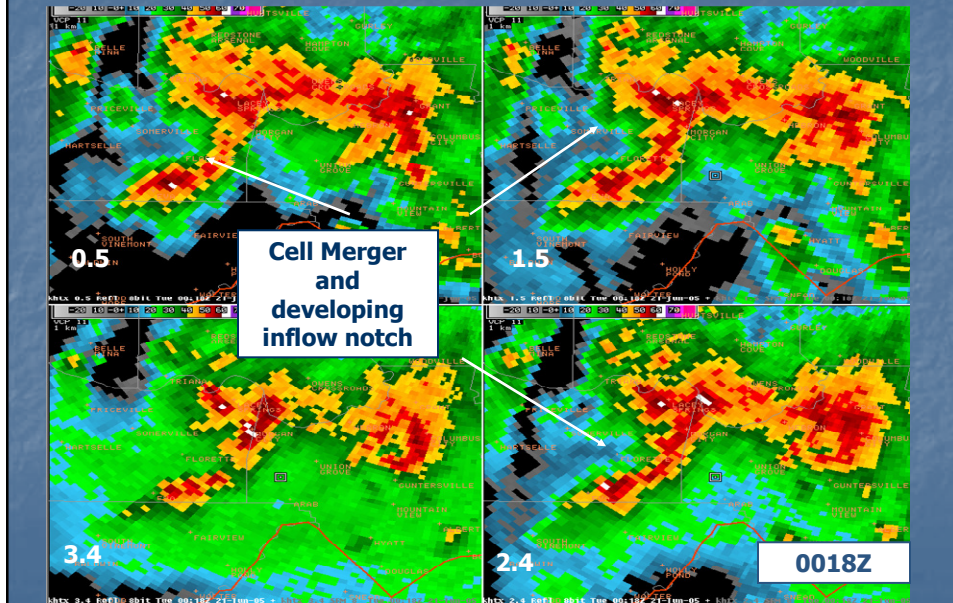
Approximate location of surface trough shown with dashed line

Storms began to fire between 20 and 21z (2057z image shown) along surface boundary and across higher terrain (elevated heat sources)

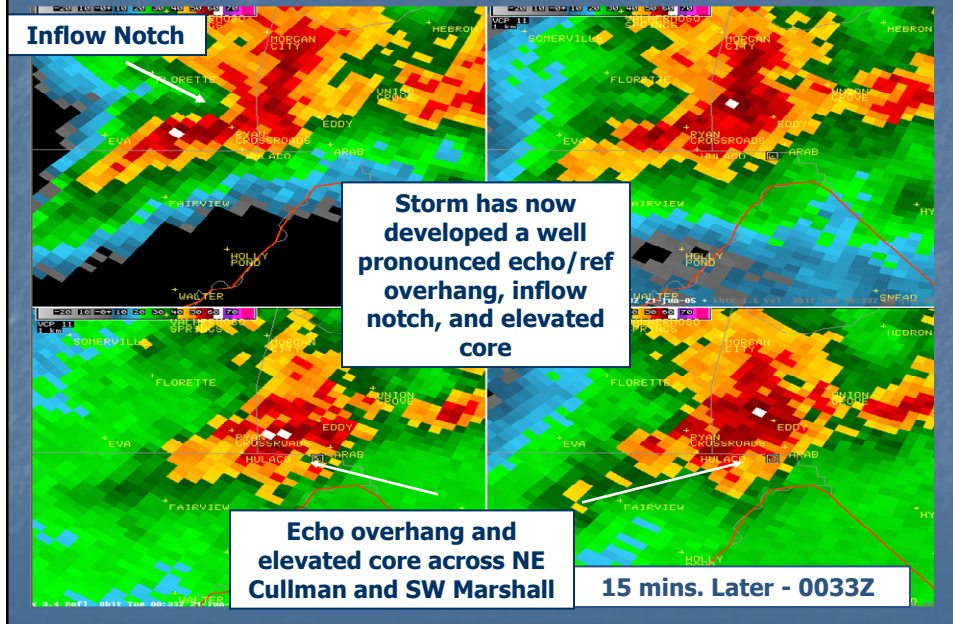




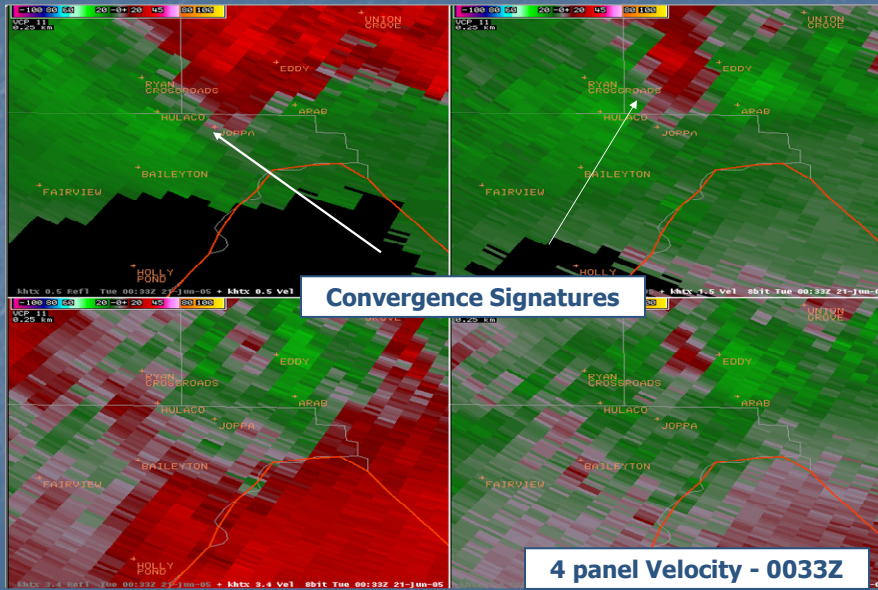
Cullman/Marshall County Storm



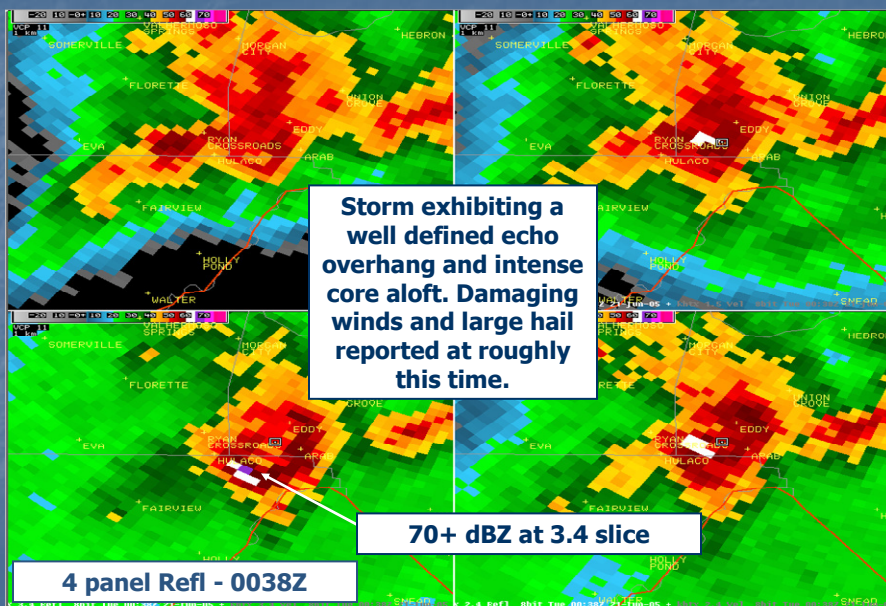
Cullman/Marshall County Storm



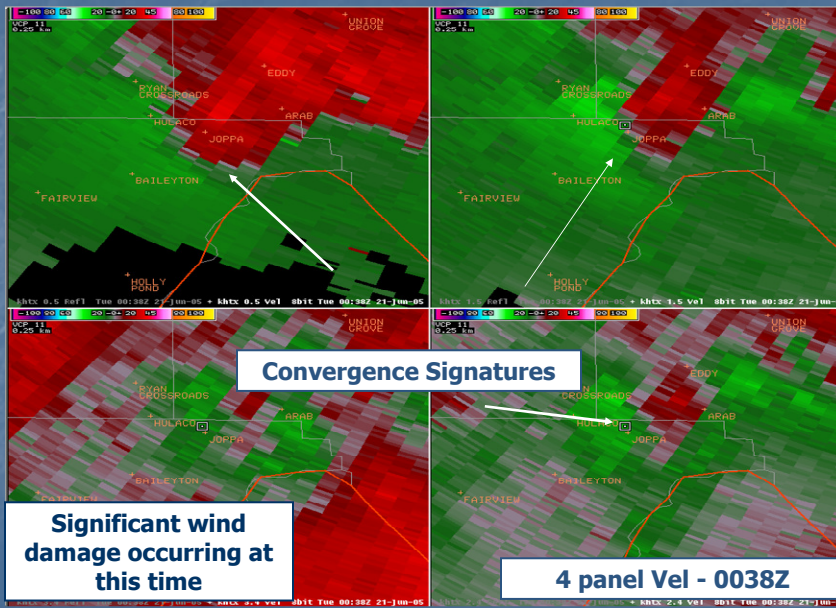
Cullman/Marshall County Storm



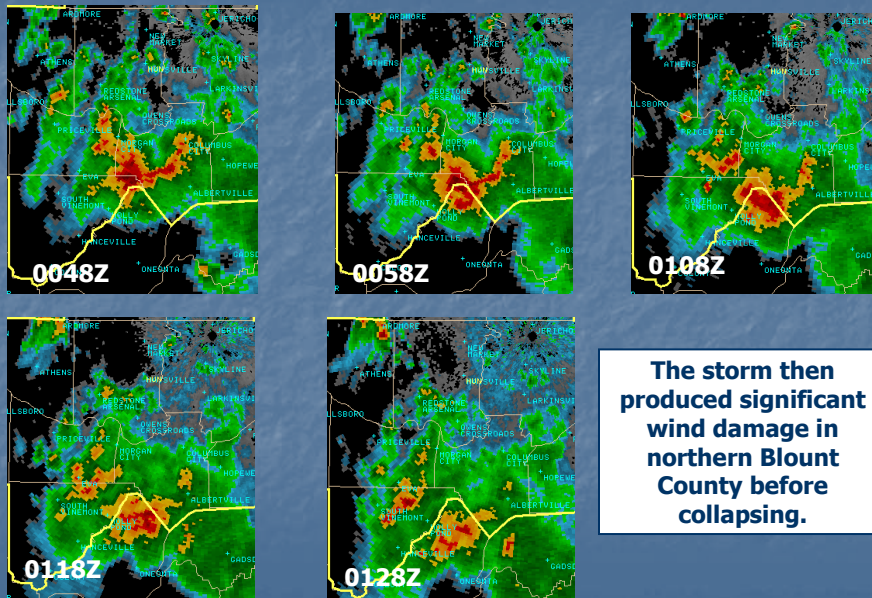
Cullman/Marshall County Storm



Cullman/Marshall County Storm



Cullman/Marshall County Storm



Cullman/Marshall County Storm

- Summary of event
 - No warning was issued for the Cullman/Marshall County Storm
 - An SPS was issued at 744 PM for Cullman County. An SPS was issued for Marshall County at 658 PM.
 - Damaging Winds occurred at 738 PM near Joppa (Cullman County)
 - 1" Hail was reported near Arab at 740 PM

Cullman/Marshall County Storm

- From a meteorological perspective...
 - There were storm scale clues available that should have led to the issuance of a severe thunderstorm warning for this storm no later than the 0033z volume scan. These include...
 - Storm history
 - Thermodynamic profiles and microburst potential
 - Cell merger and localized intensification of updraft strength
 - Echo overhang, intense core aloft, tight reflectivity gradient, and convergence couplets evident on 4 panel velocity data