APRIL 25, 2008 MITCHELL COUNTY KS EF2 TORNADO

PART II

MODEL PERFORMANCE

by
Aaron Johnson – WFO Hastings
Kurt Buffalo – WFO Hastings

Models Reviewed

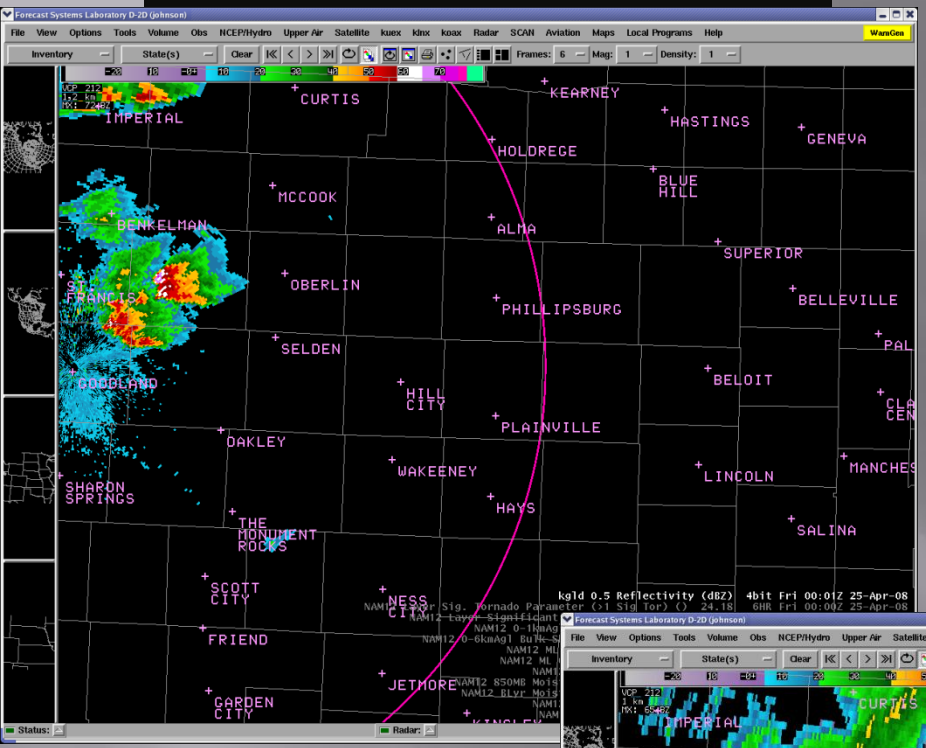
- Review April 24th 18Z NAM12 performance at the following times on April 25th:
  - 00Z
  - 03Z
  - 06Z

- Review April 21st 21Z through April 25th 03Z SREF output valid at:
  - 06z

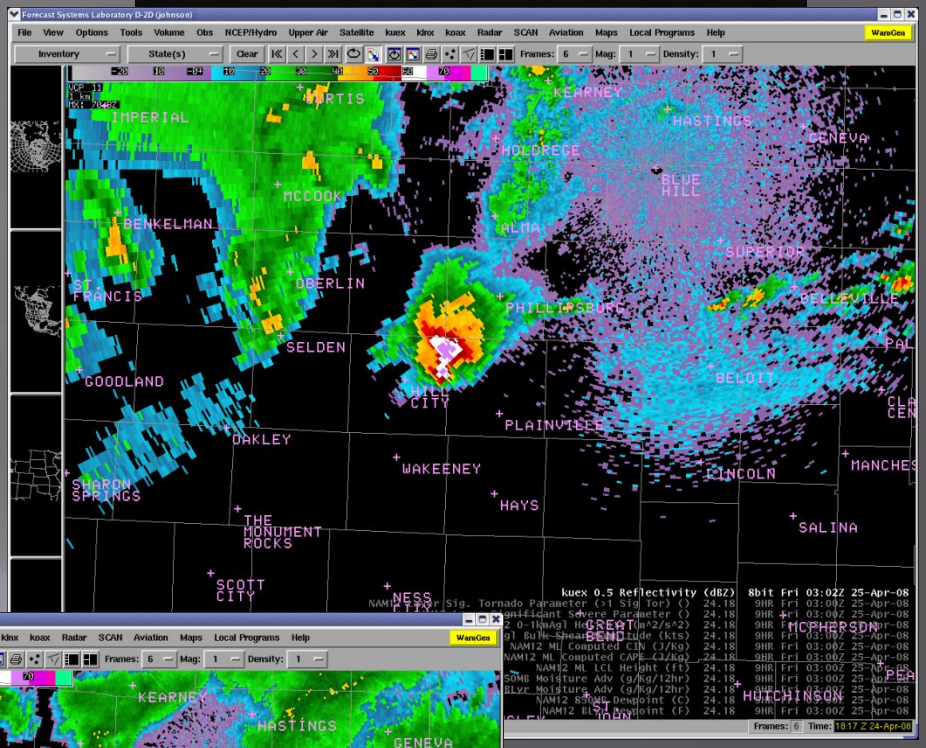
NAM12 Review

- Why 18Z Run?
  - Given late timing of convection…day/evening shifts had adequate time to review 18Z run instead of referring to older 12Z run.
  - Event ongoing as 00Z model run arrived and was not heavily utilized by Evening/Mid shifts.

Non-Tornadic at 00Z

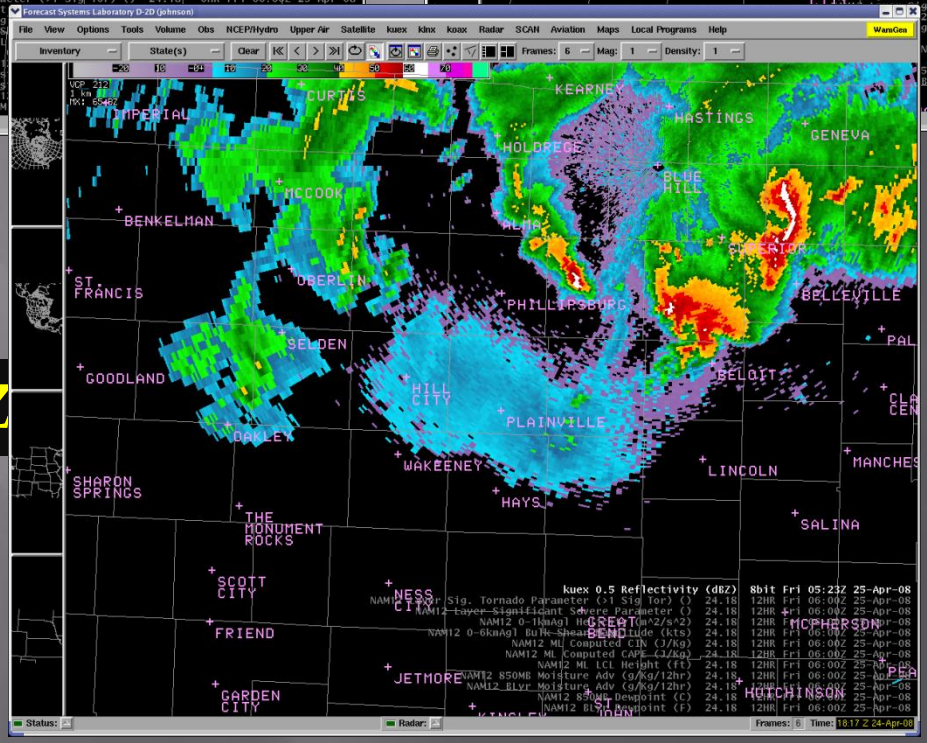


Non-Tornadic at 03Z



Radar Imagery

Tornadic at 05-06Z

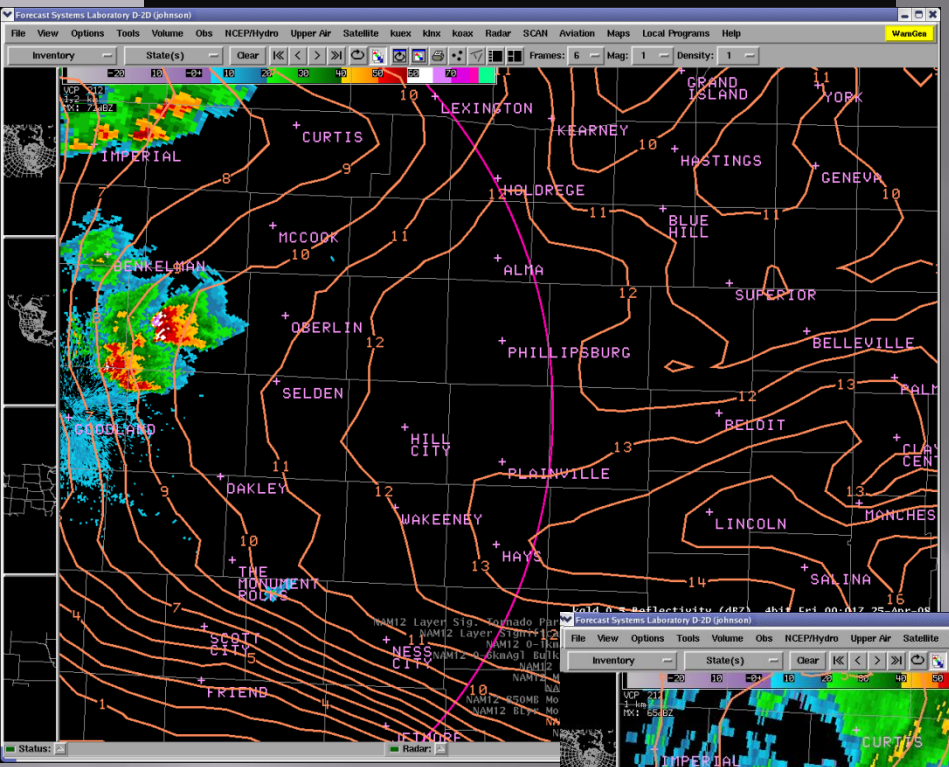


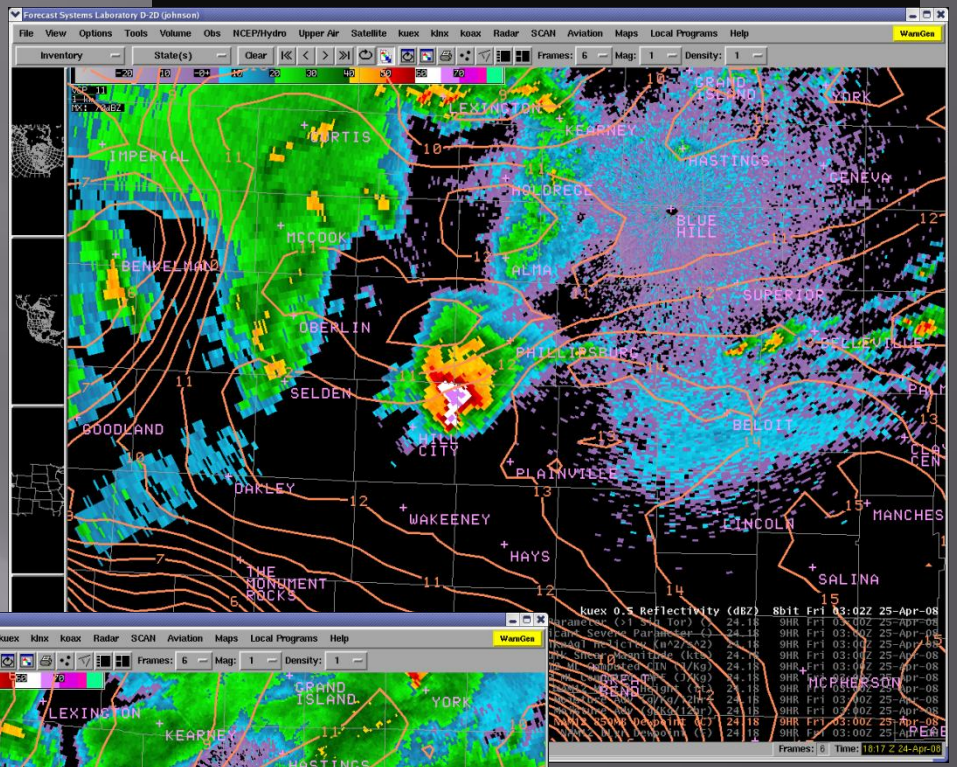
Review of Key Features that changed non-Tornadic Supercell into a Tornadic Supercell from Part I:

- Moderate to strong moisture advection in the Boundary Layer (mainly near 850mb) after 03Z produced/allowed:
  - Decreased Boundary Layer Inhibition
  - Increased Boundary Layer Instability
  - Convection remaining rooted in the Boundary Layer despite nocturnal timing favoring trend toward elevated convection
- Development of LLJ allowed:
  - Surface based convection to ingest much higher levels of low-level shear
- 0-6km/Effective Deep layer shear remained nearly steady

850mb Td ~ +10 C at 00Z

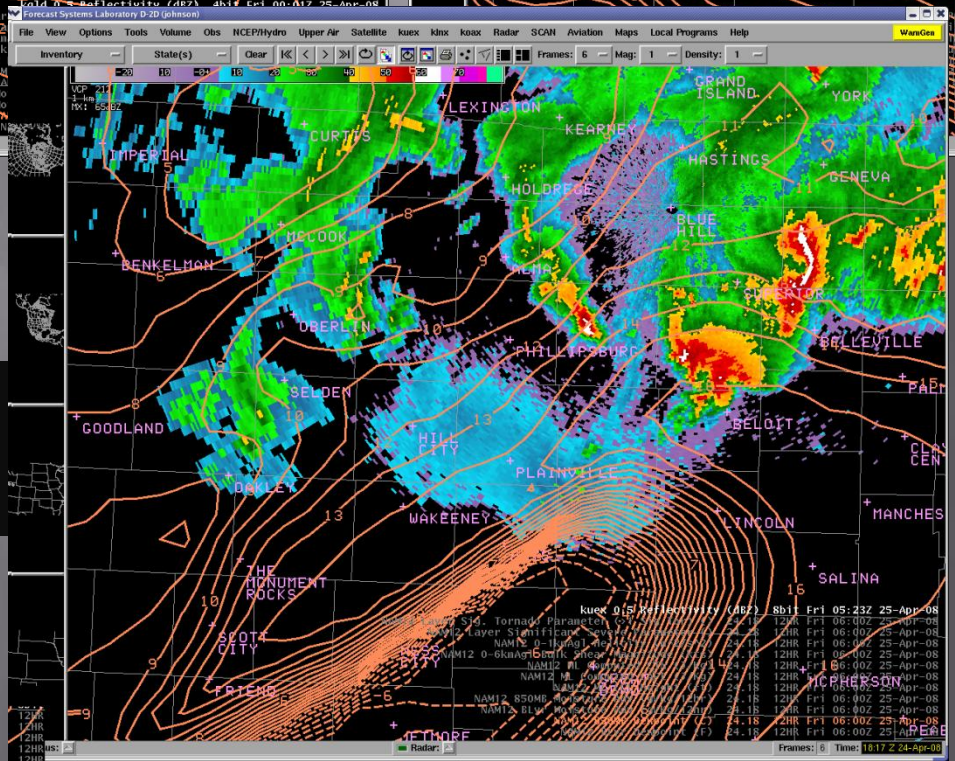
850mb Td ~ +13 C at 03Z



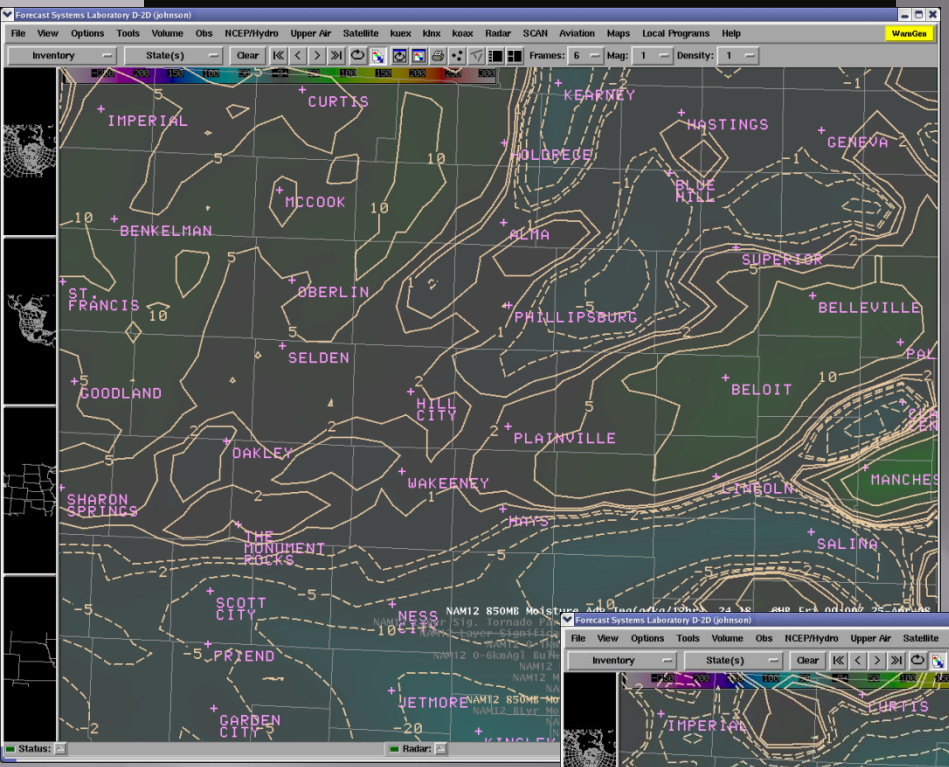


850mb Td

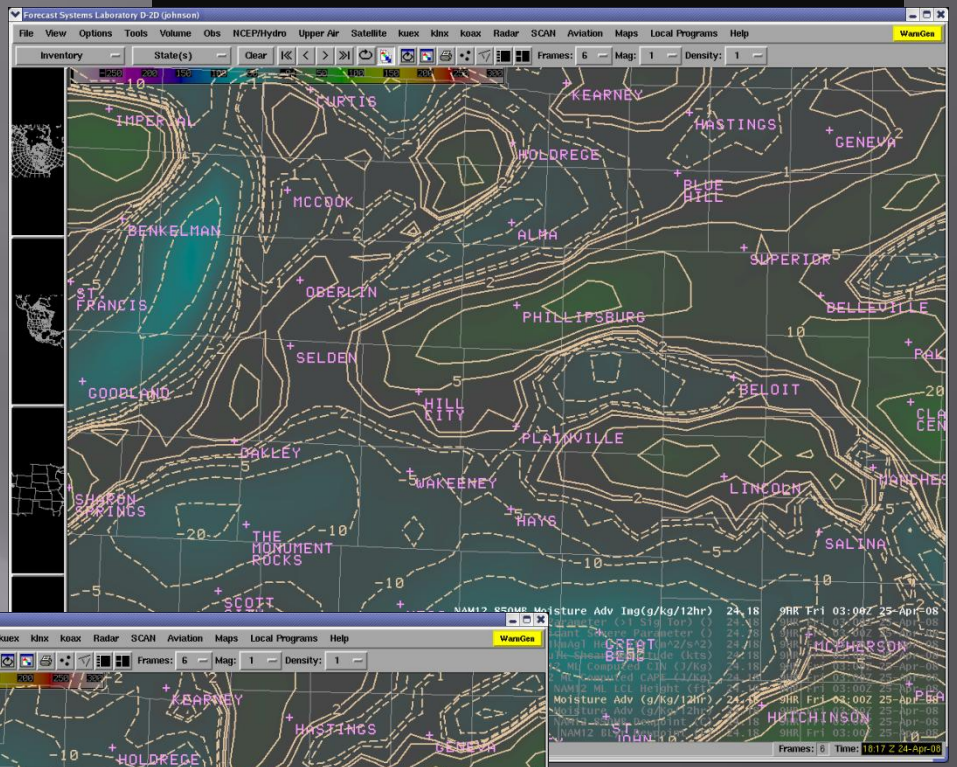
850mb Td ~ +16 C at 06Z



Non-Tornadic at 00Z

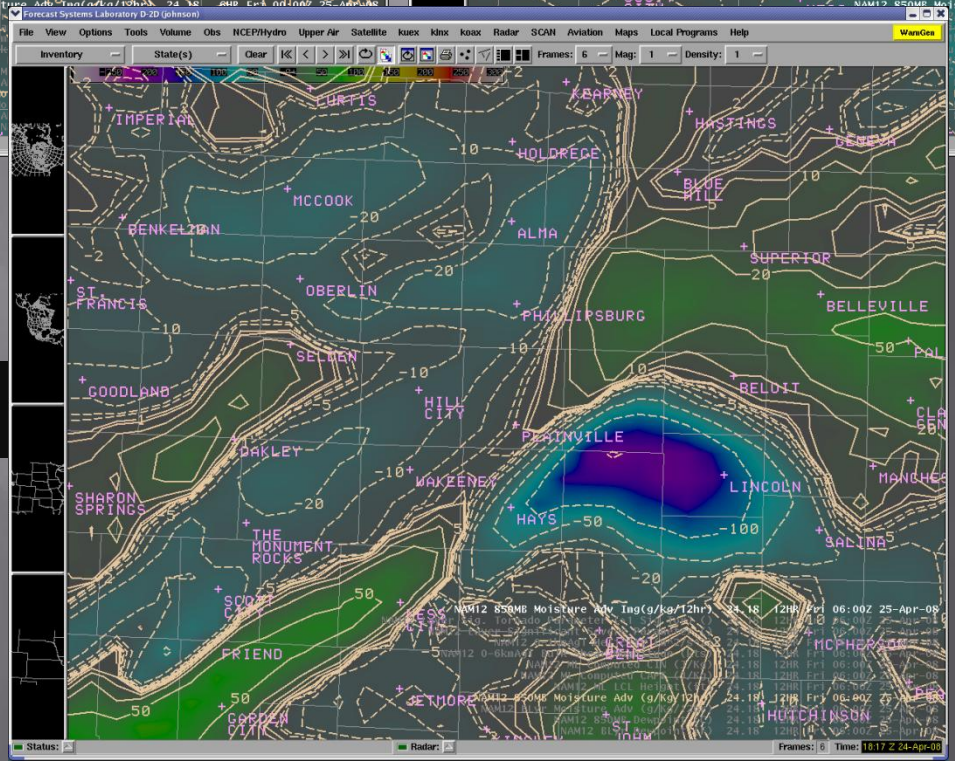


Non-Tornadic at 03Z



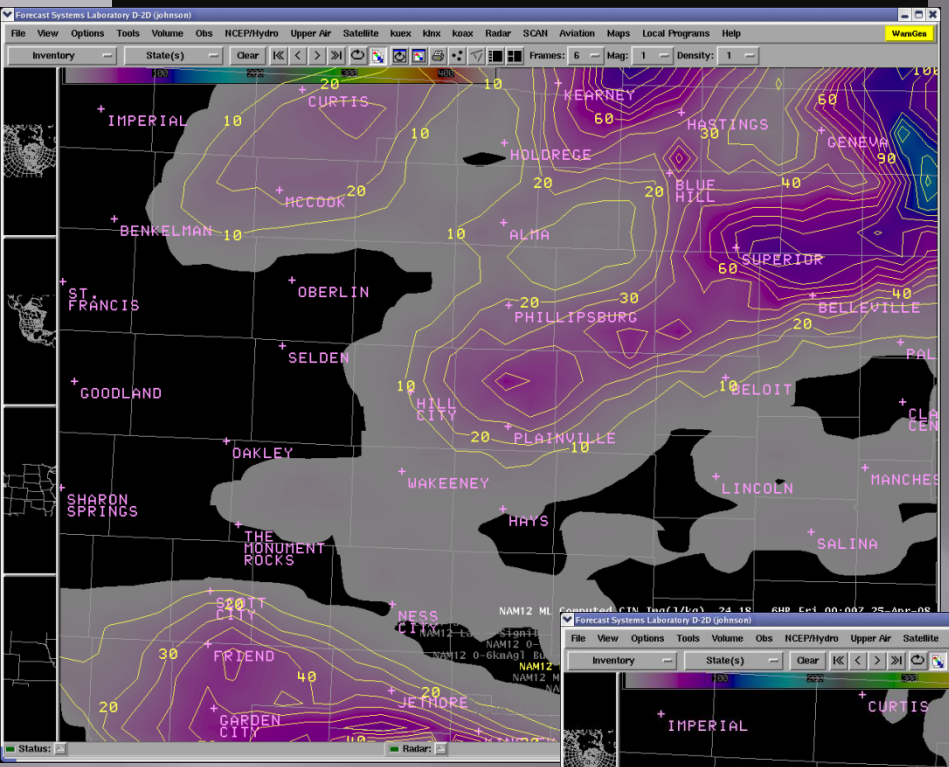
850mb Moist Advection

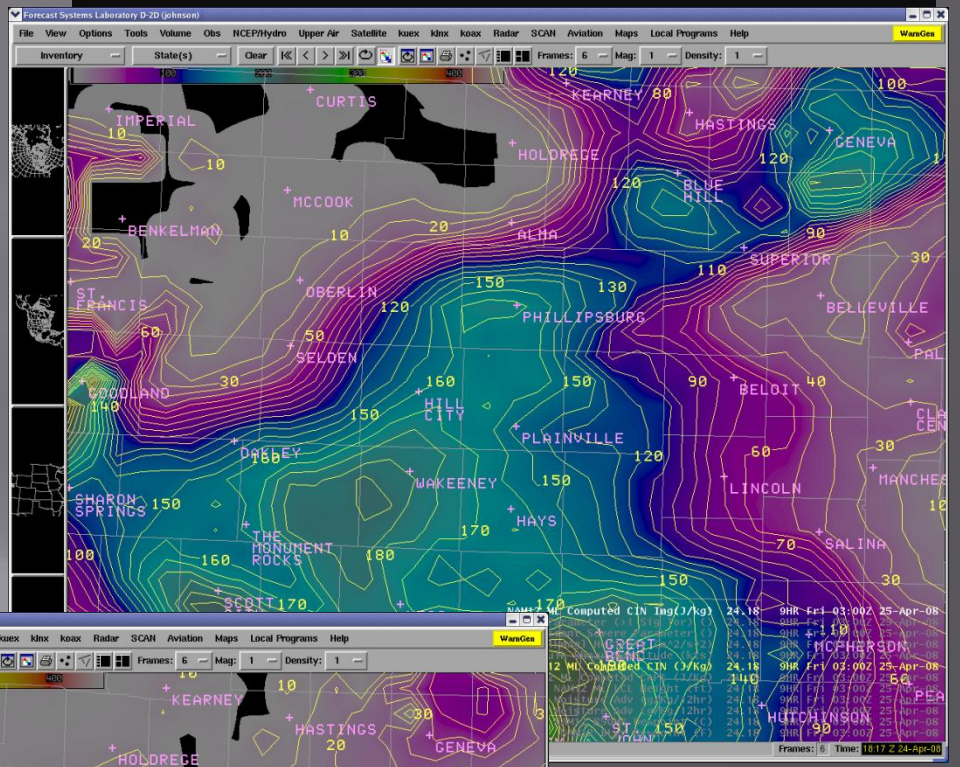
Tornadic at 06Z



0-1 km ML CIN ~ 0 at 00Z

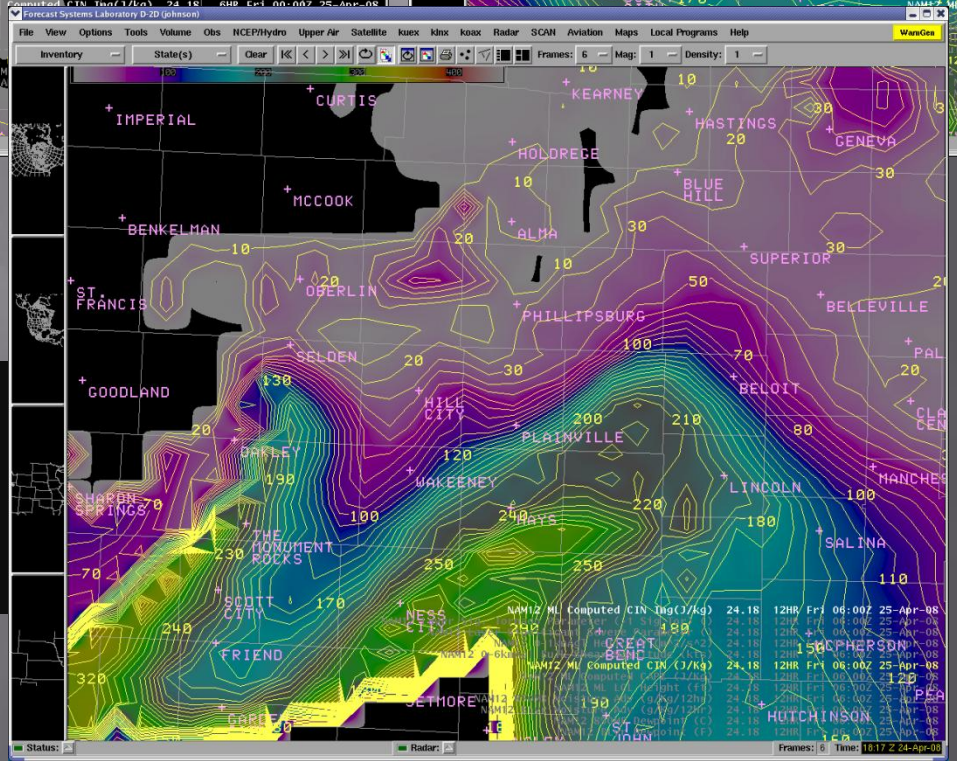
0-1 kmML CIN ~ -165 at 03Z





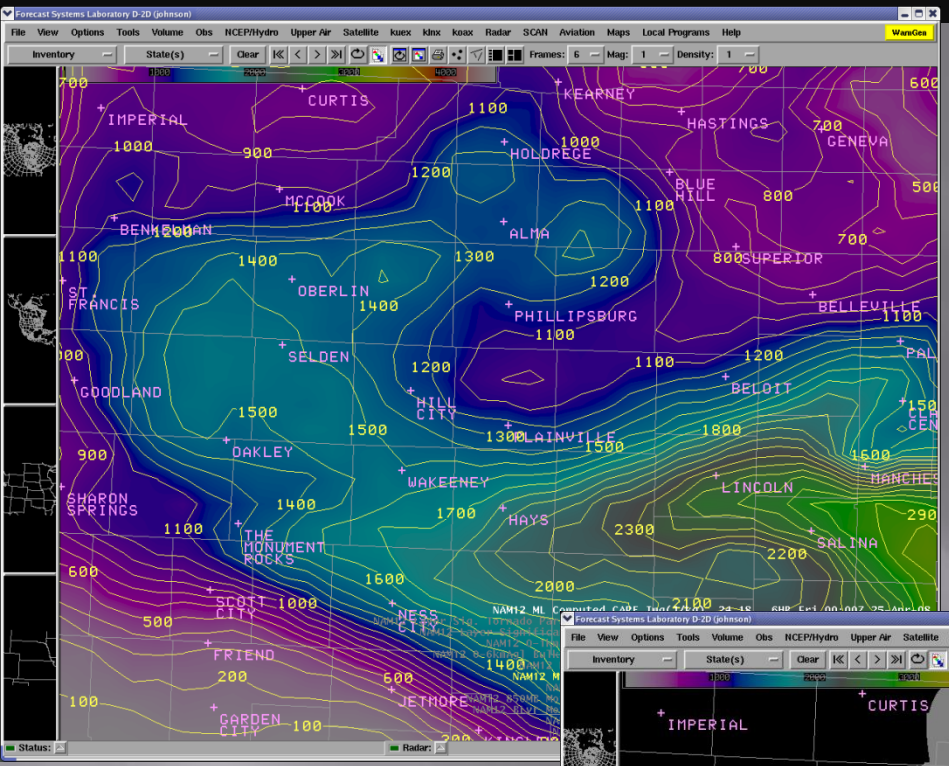
0-1km ML CIN

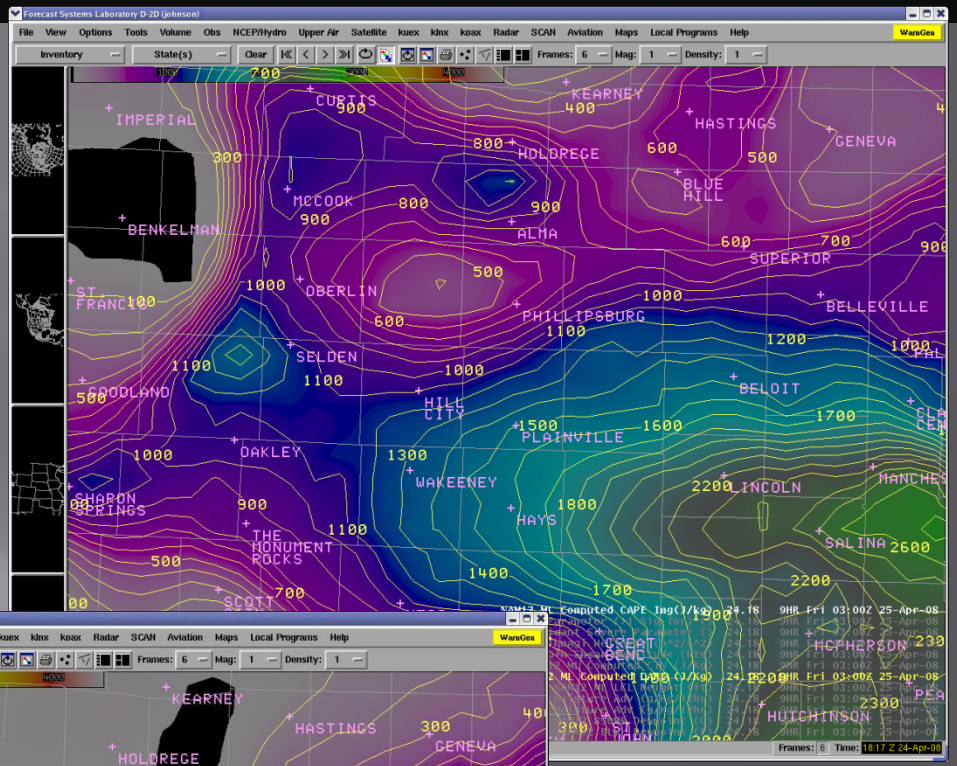
0-1 km ML CIN ~ -80 at 06Z



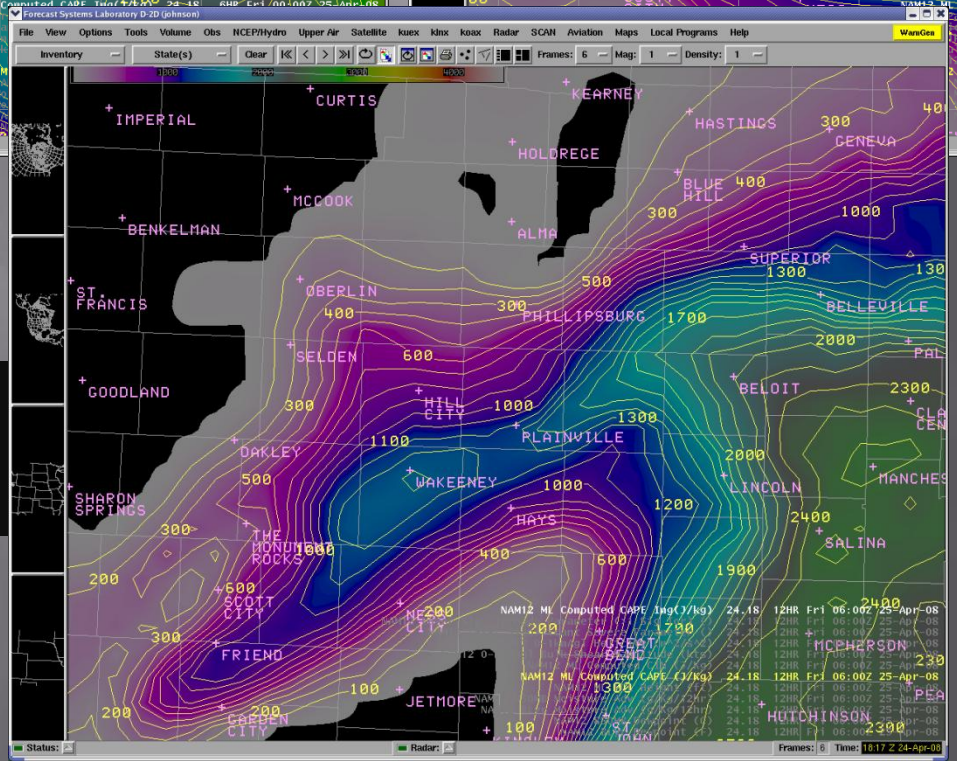
0-1 km ML CAPE ~ 1400 at 00Z

0-1 km ML CAPE ~ 1200 at 03Z



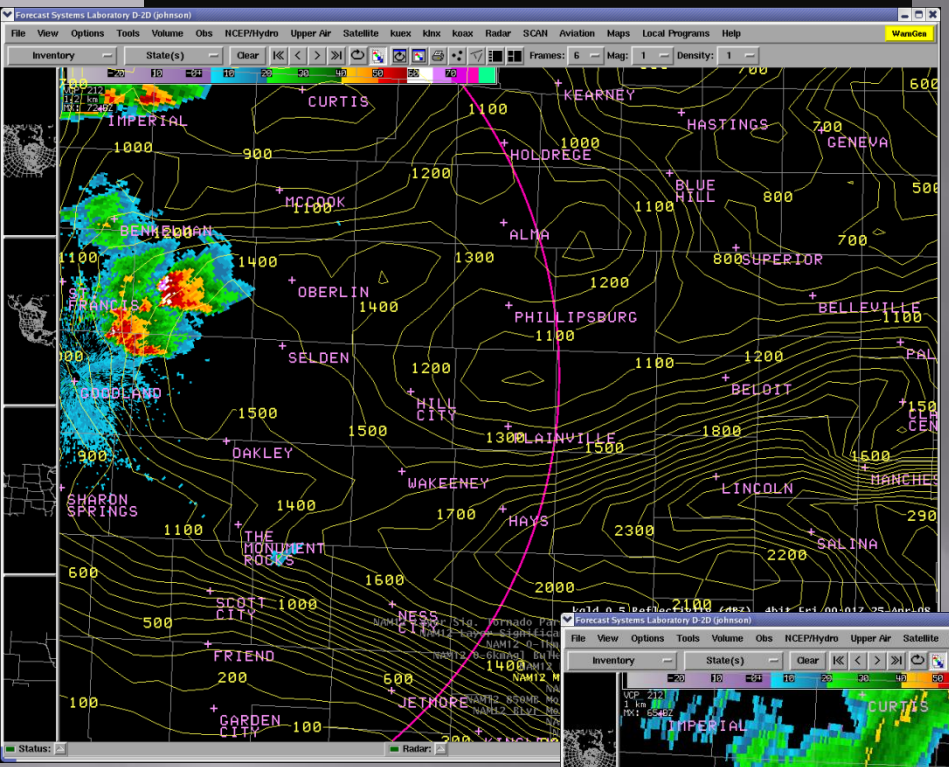


0-1km ML CAPE

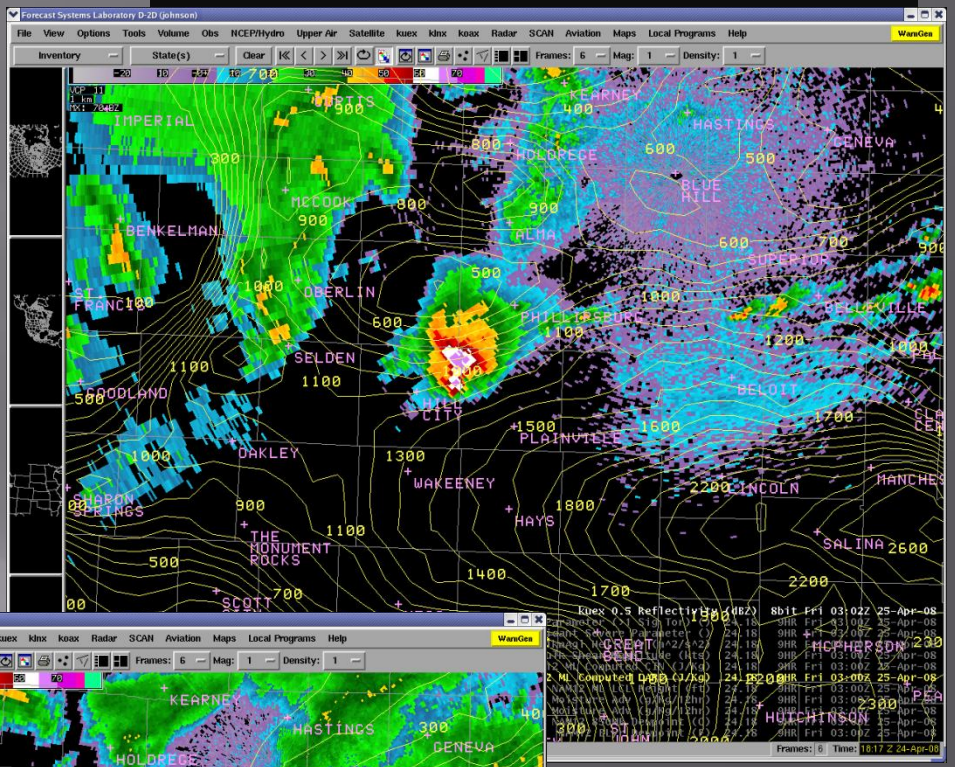


0-1 km ML CAPE ~ 2100 at 06Z

Non-Tornadic at 00Z

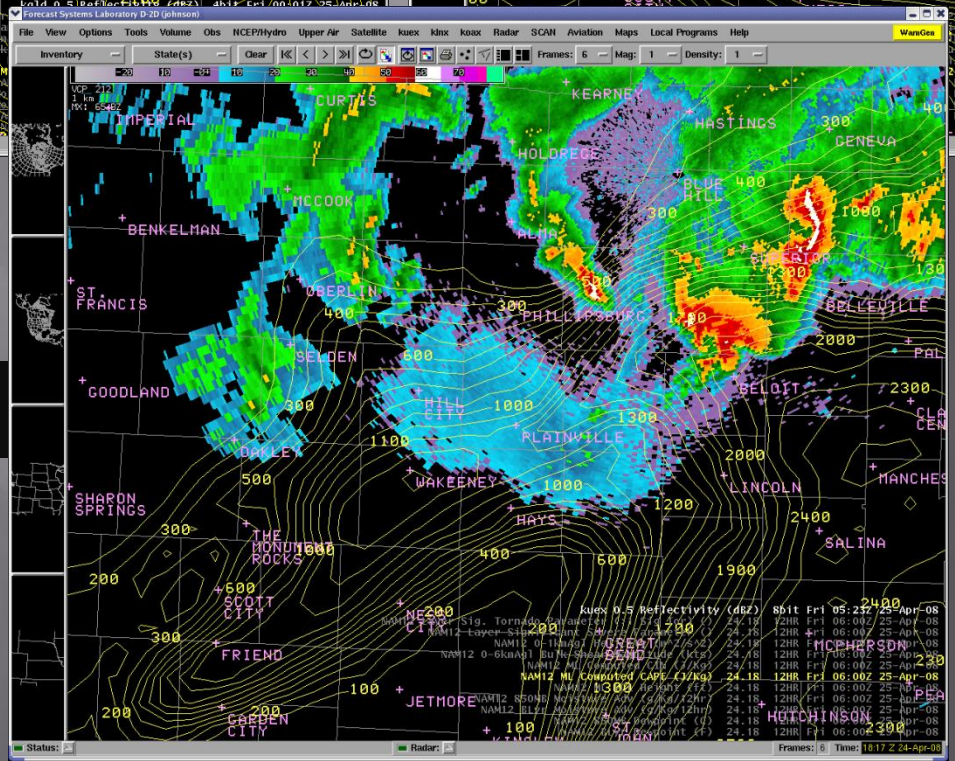


Non-Tornadic at 03Z

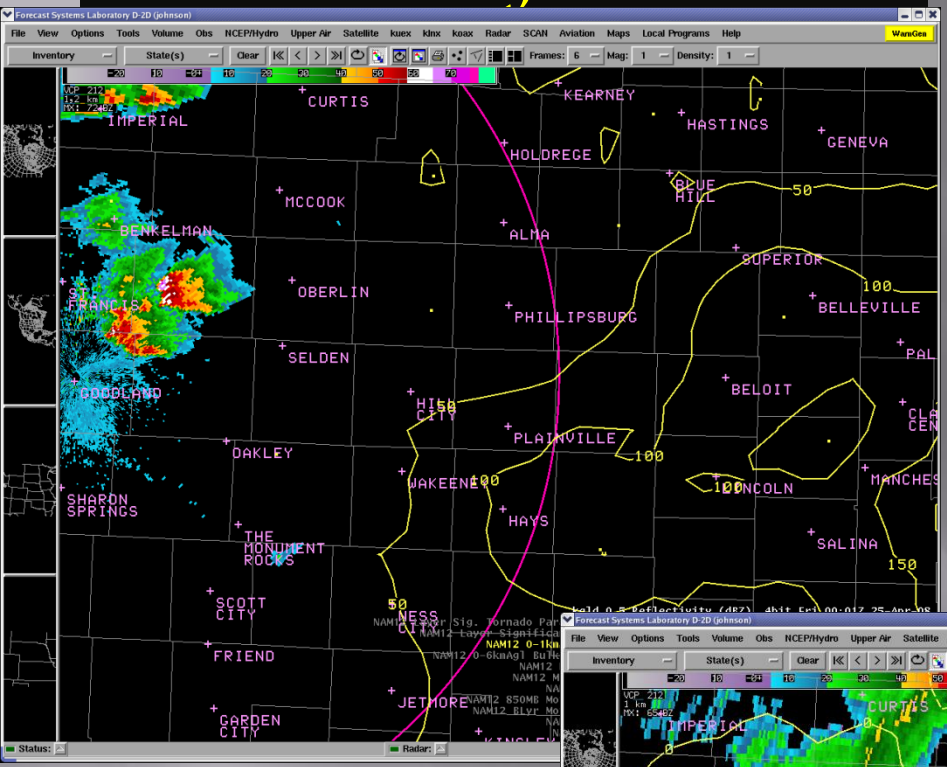


0-1km ML CAPE

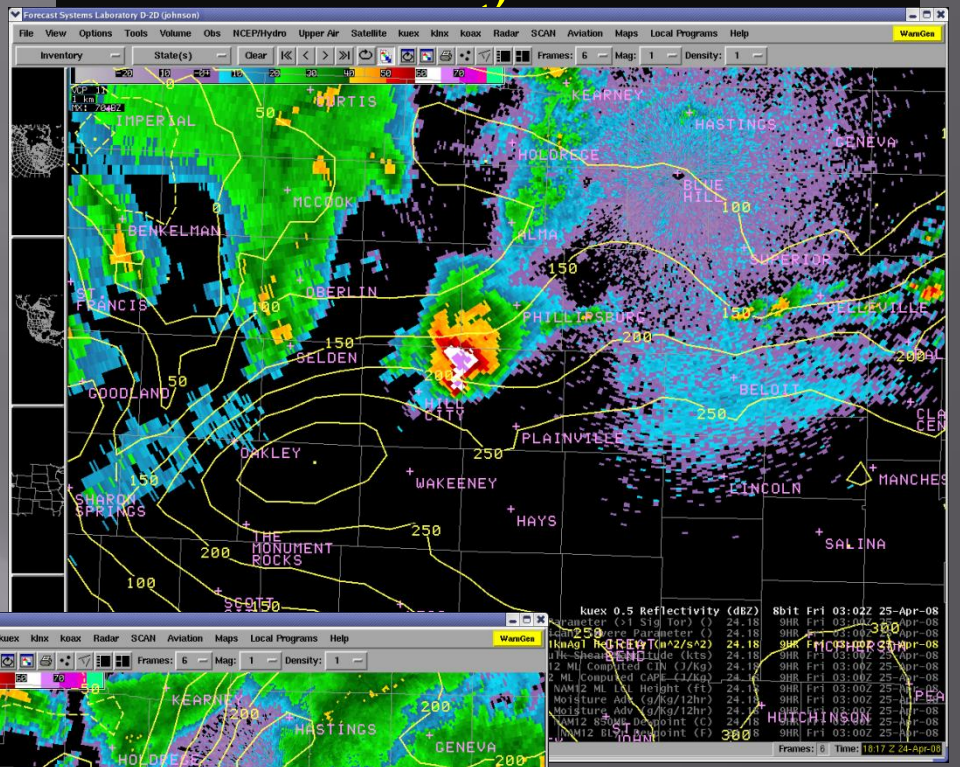
Tornadic at 05-06Z



0-1 km Helicity ~ 25 at 00Z

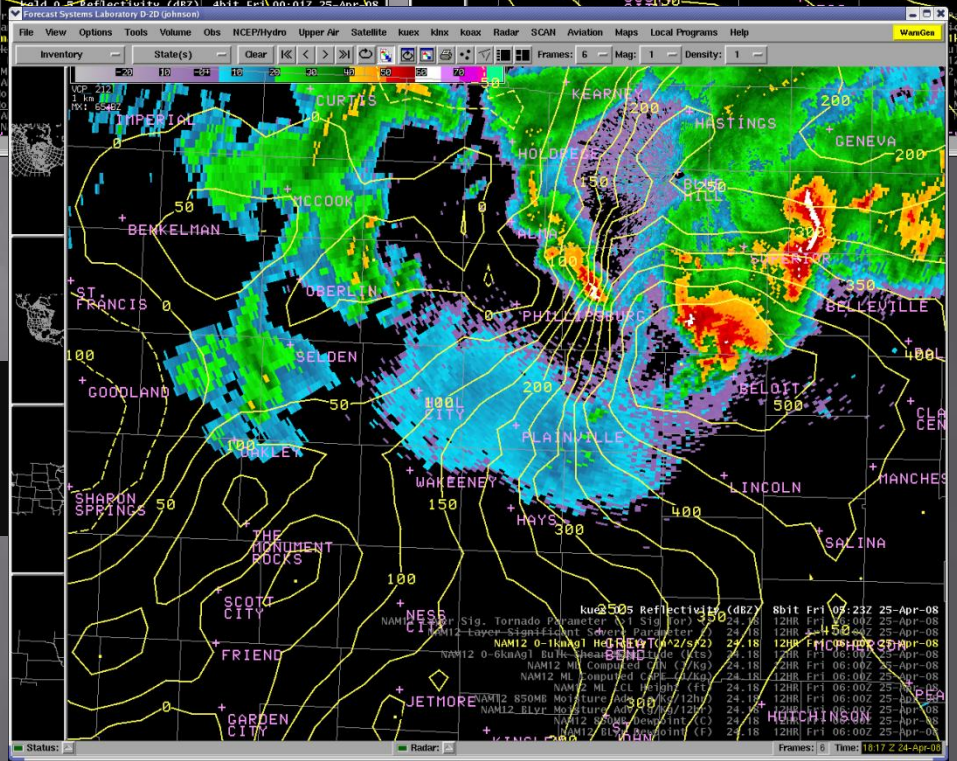


0-1 km Helicity ~ 200 at 03Z



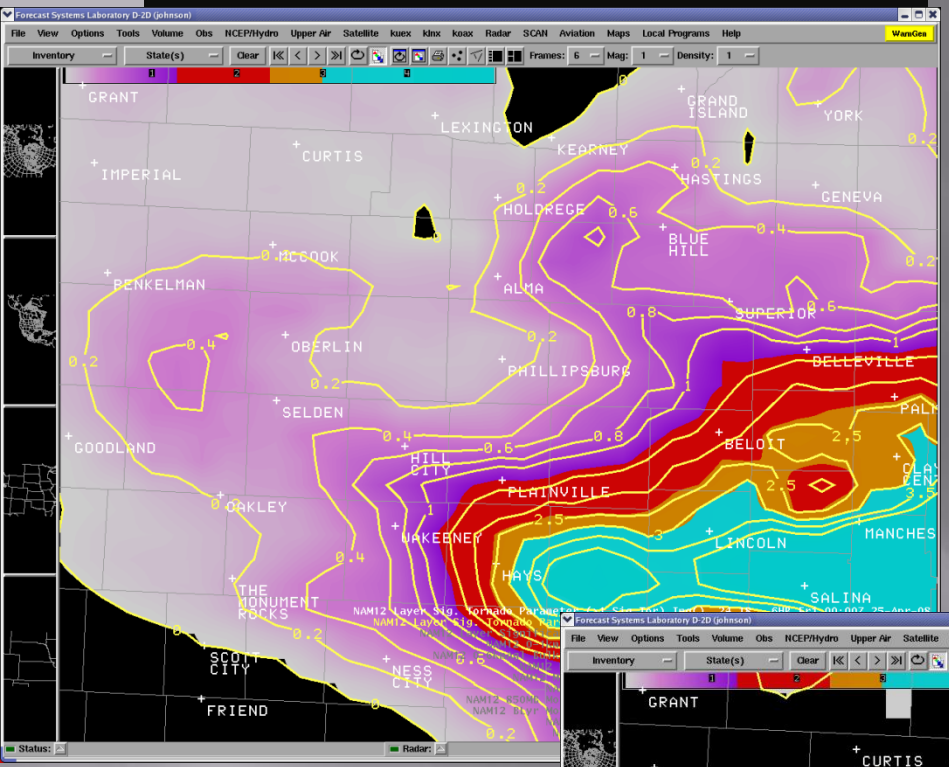
0-1km Helicity

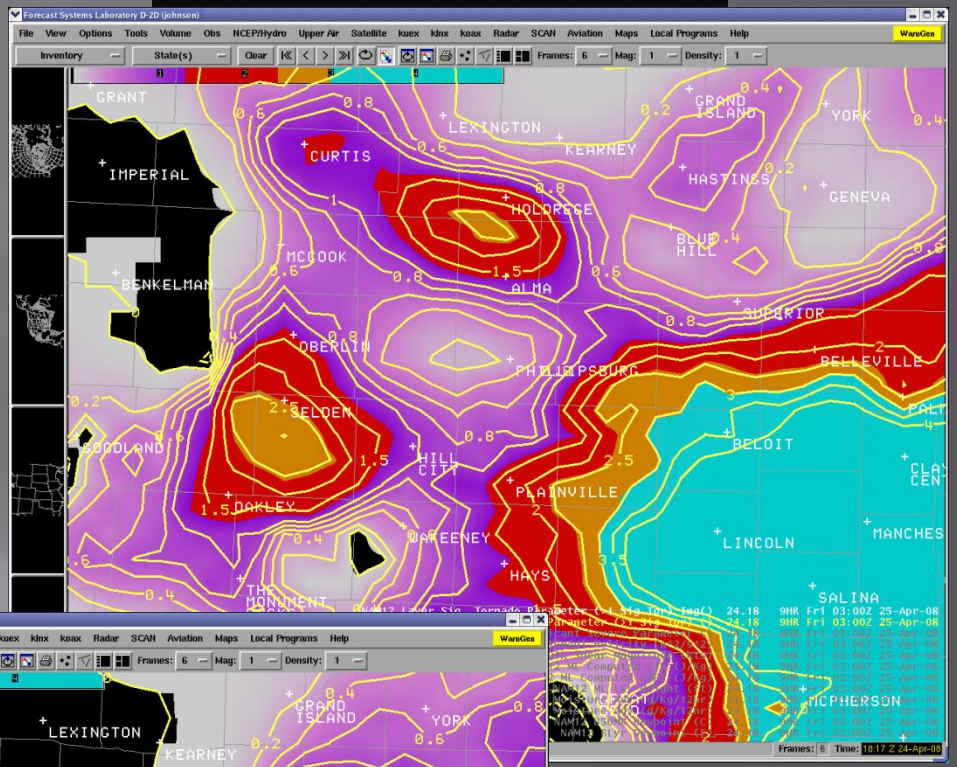
0-1 km Helicity ~ 500 at 06Z



STP ~ 0.4 at 00Z

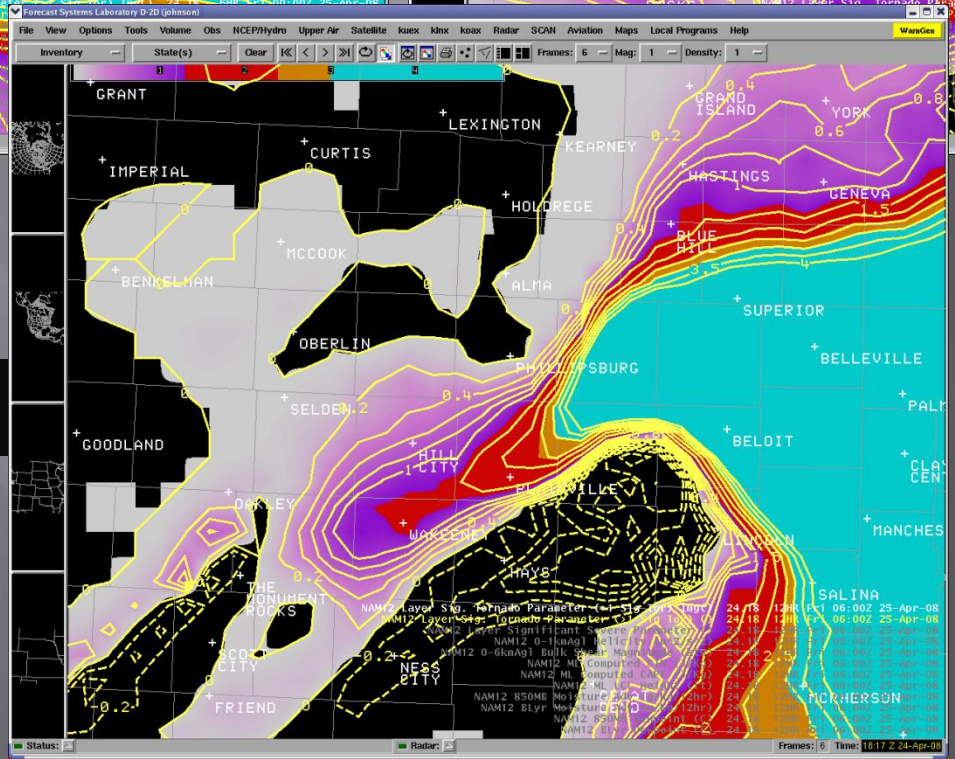
STP ~ 0.9 at 03Z





Fixed Layer Sig Tor

STP ~ 6 at 06Z

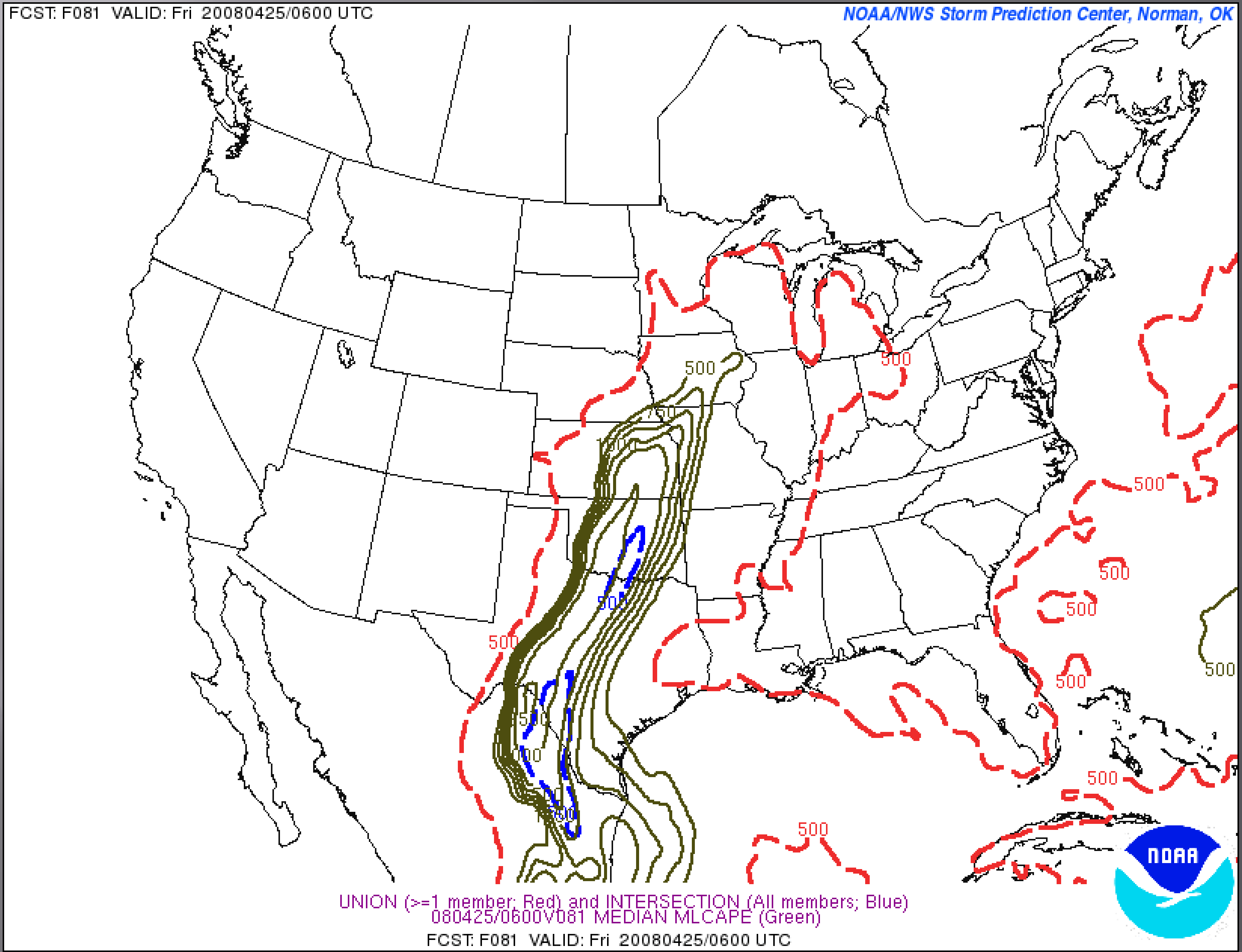


SREF Review

- Limited data compared to operational runs off SPC SREF page
- Reviewed data for a fixed time of 06Z but from 14 different runs of the SREF:
  - Begin with April 21st 21Z SREF 81 hour forecast
  - End with April 25th 00Z 3 hour forecast
- Data Available
  - ML CAPE
  - 0-1km SRH
  - SIG TOR

SREF Mean ML CAPE

SREF Mean ML CAPE



SREF Probability of ML CAPE >= 2000 J/kg

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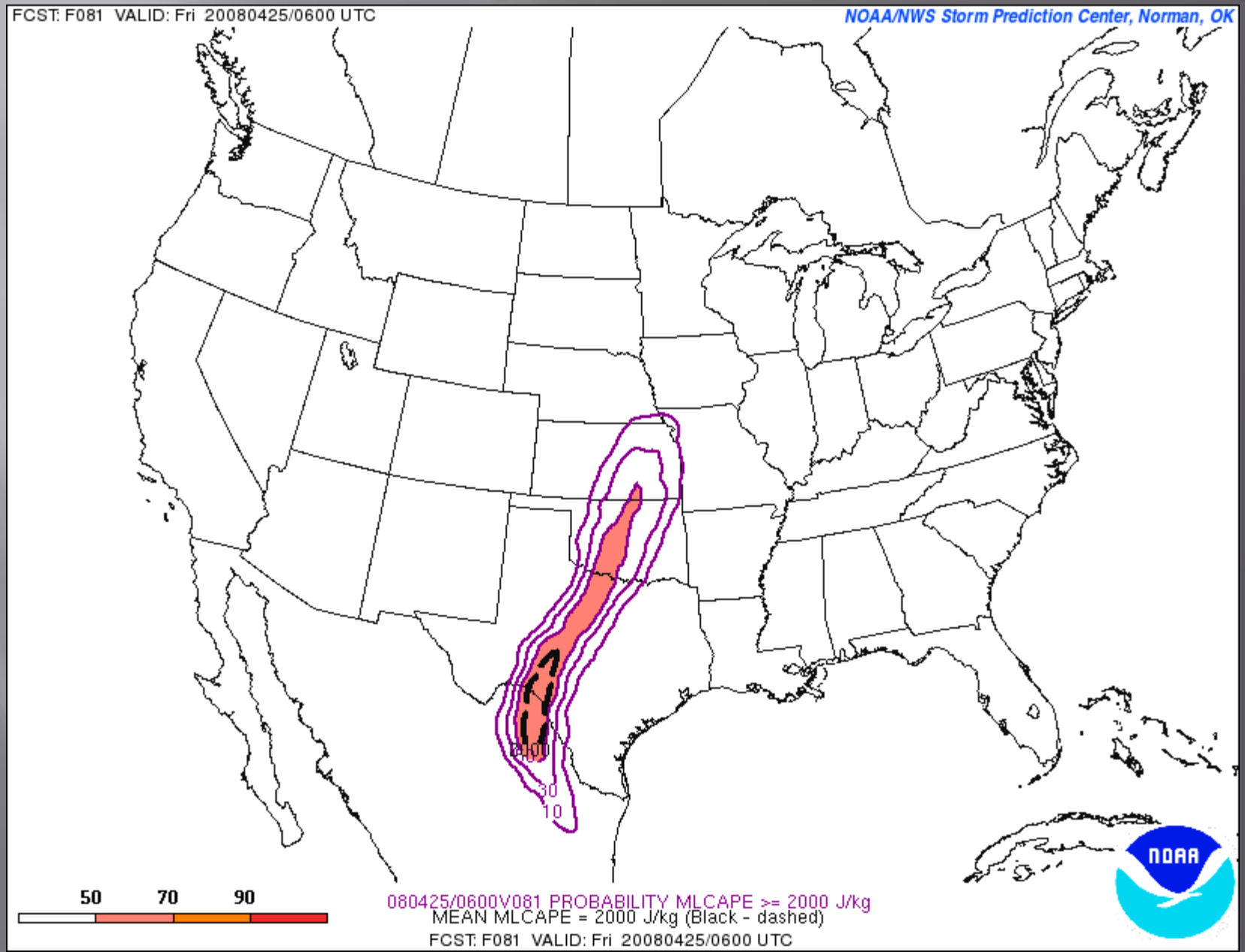
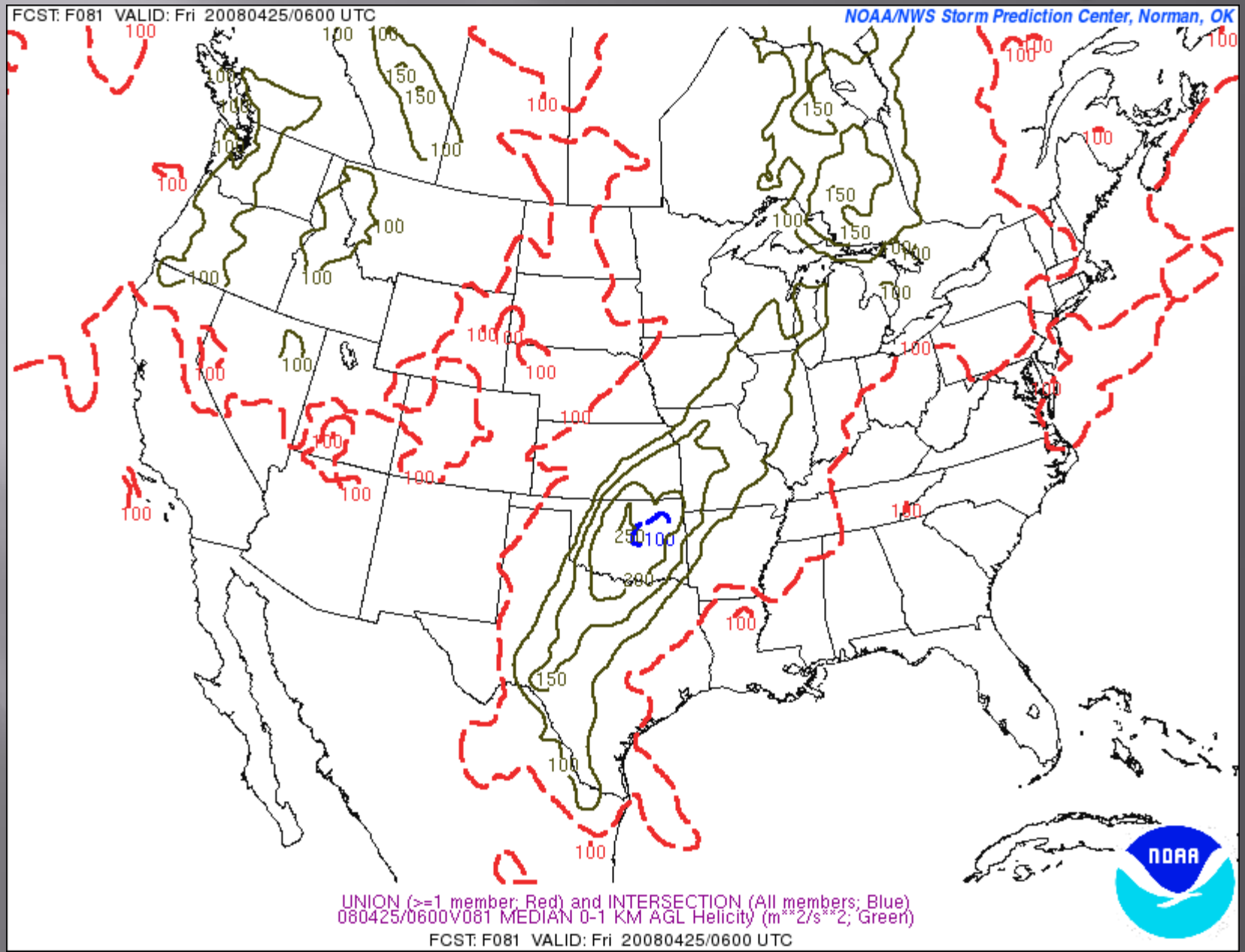


SREF Mean 0-1 KM AGL Helicity

SREF Mean 0-1 KM AGL Helicity



SREF Probability of Significant Tornado Parameter >= 3

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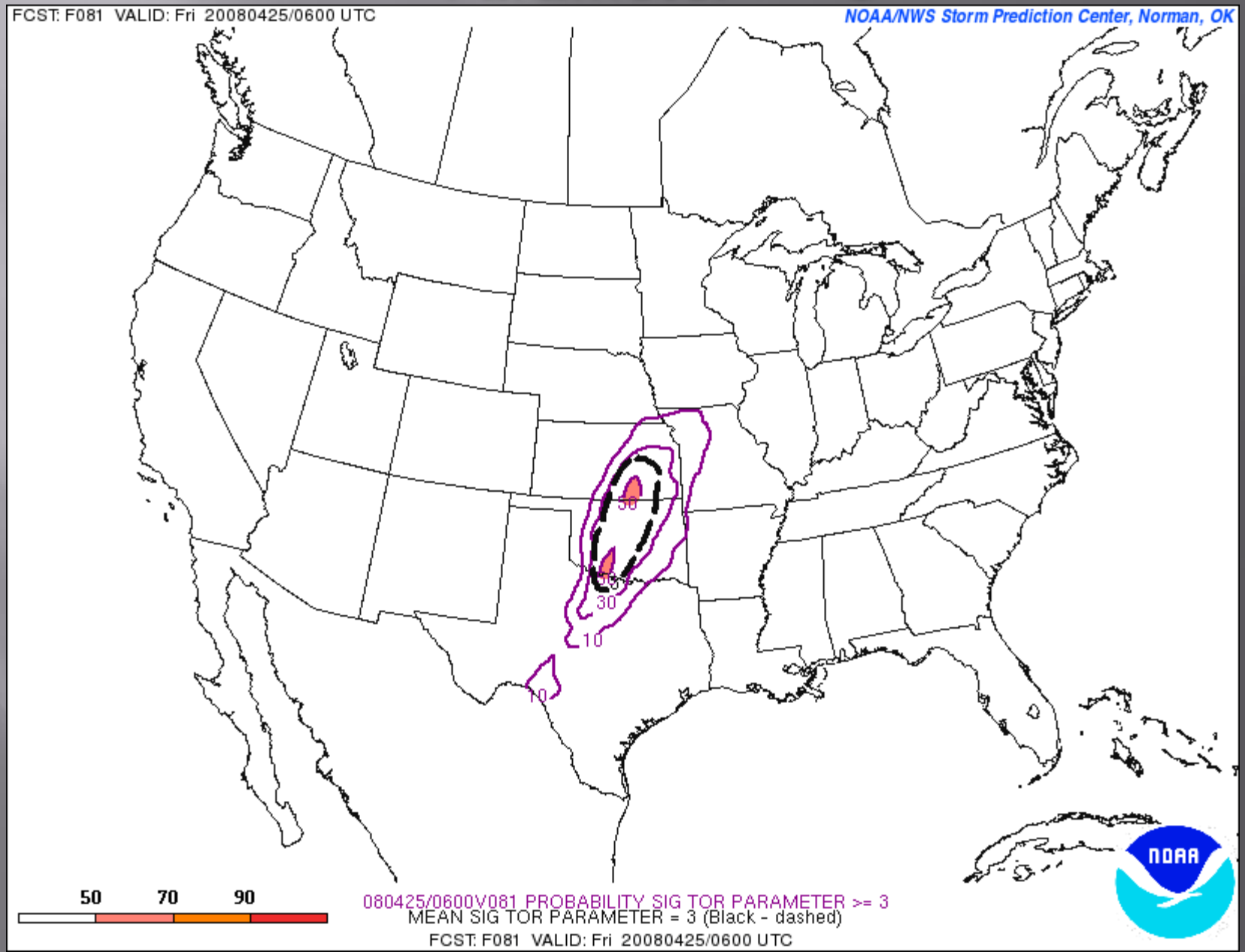

SREF Significant Tornado Ingredients

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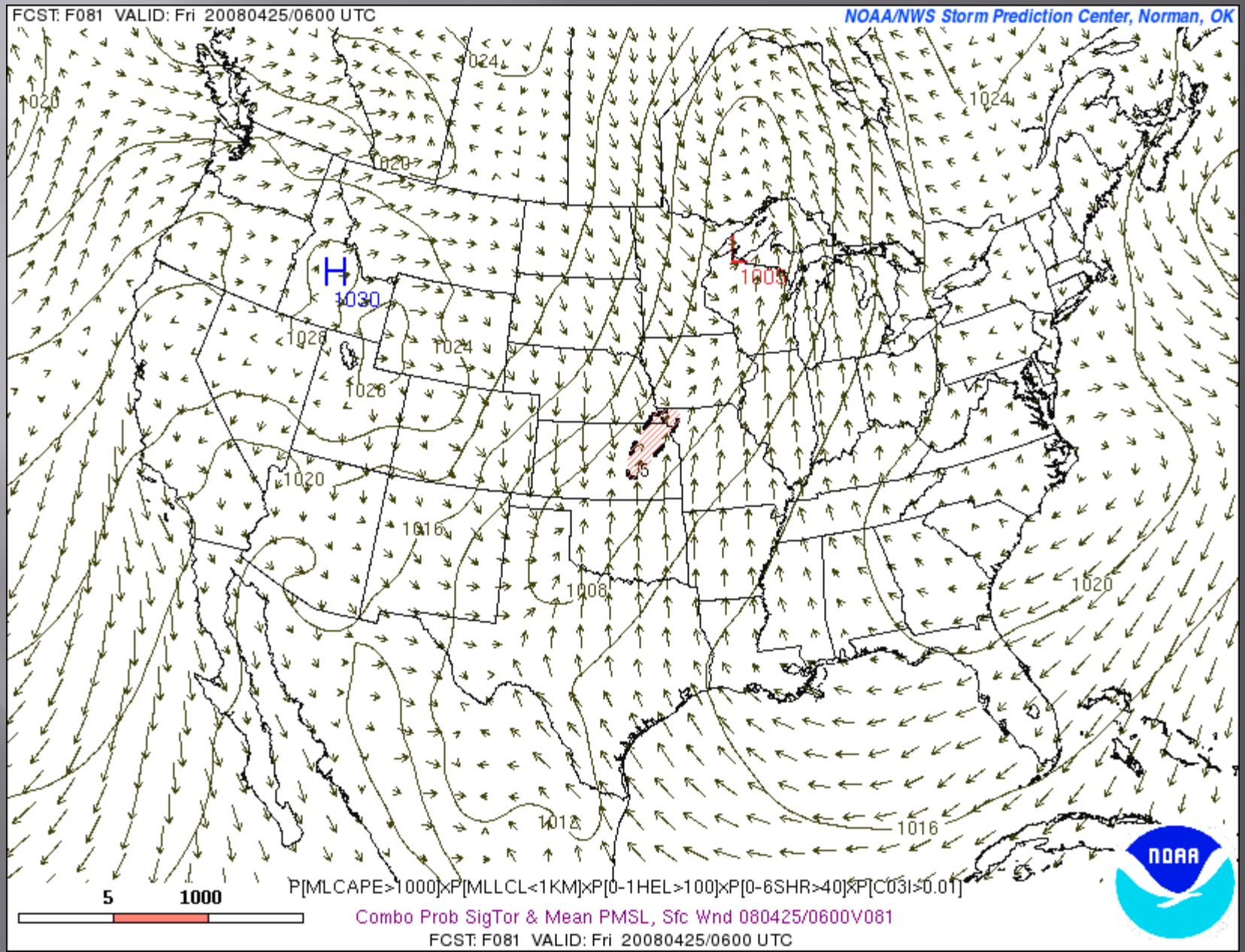

Summary of Results

- 18Z NAM12 performed decently with trend toward decreasing Boundary Layer Inhibition/Increasing Boundary Layer Instability via deep moisture advection

- 18Z NAM12 also performed decently with increasing low-level shear profiles in response to development of a LLJ

Summary of Results

- SREF output of ML CAPE:
  - Correctly showed trend in wrapping higher CAPE into North-Central KS within 39-45 hr fcst output range
  - Values (both mean and probability) still too low for all of the SREF output
  - SREF output beyond 39-45 hrs displayed little skill.
- SREF output of 0-1km Helicity:
  - No trend in increasing Helicity until within the 21-27 hr fcst output range
  - Values (both mean and probability) too low until within the 9 hr fcst output range
- SREF output of Sig Tor parameter:
  - Similar to 0-1km Helicity…little to no trend of increasing values until within 21-27 hr fcst
  - Also similar to 0-1 km Helicity…values still too low until the 3-9 hr fcst output range
  - Sig Tor Ingredients displayed best skill at showing potential for an EF2+ tornado at around 06Z within 51 hr fcst output range and increase in values at around 21 hr fcst output range

Questions?