Some More Examples

April 9, 2011 – Mapleton, IA (western Iowa)

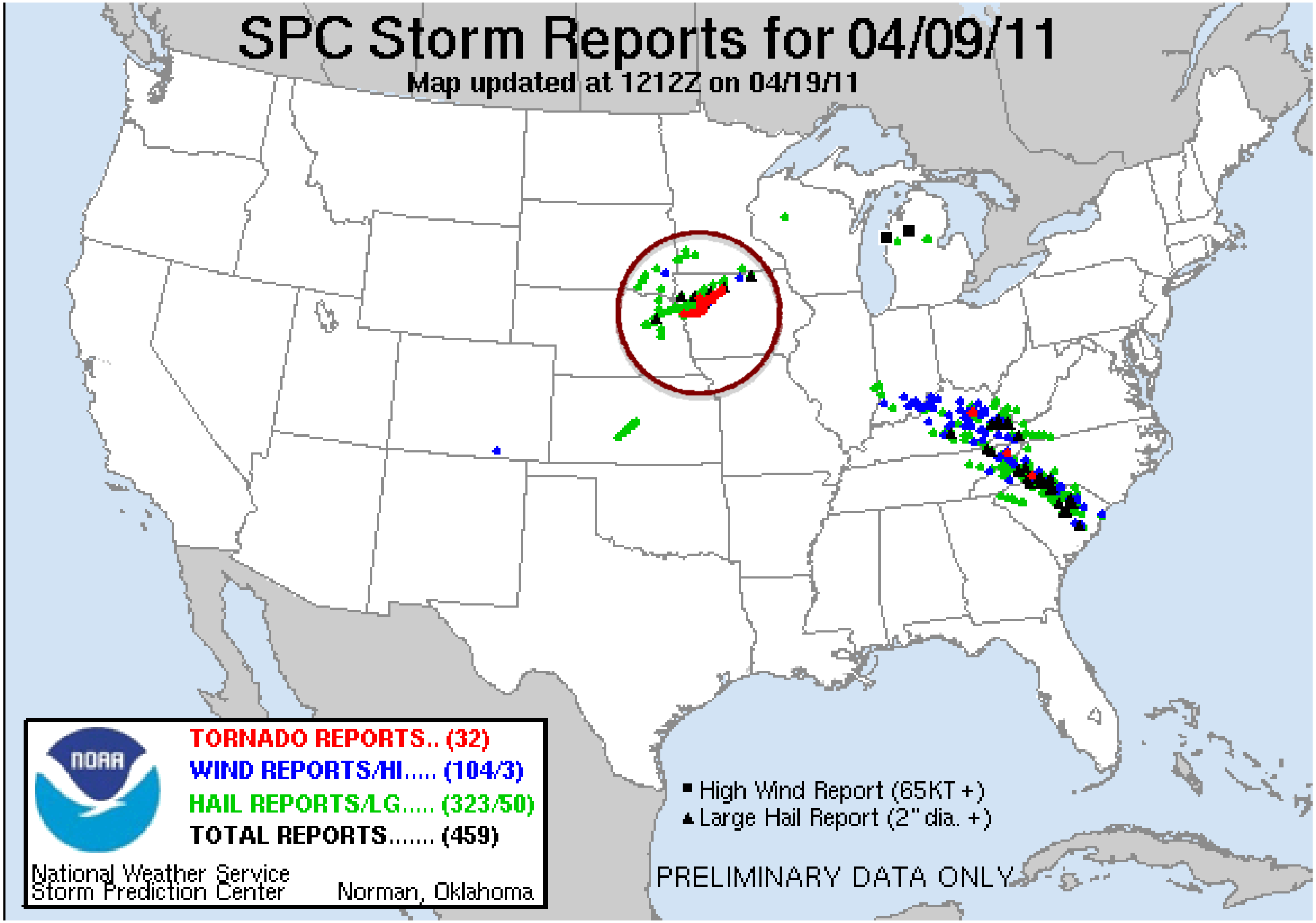
- Tornado struck Mapleton around 00z,

- Convection starts in far eastern Nebraska about 2230z just as area became substantially more unstable

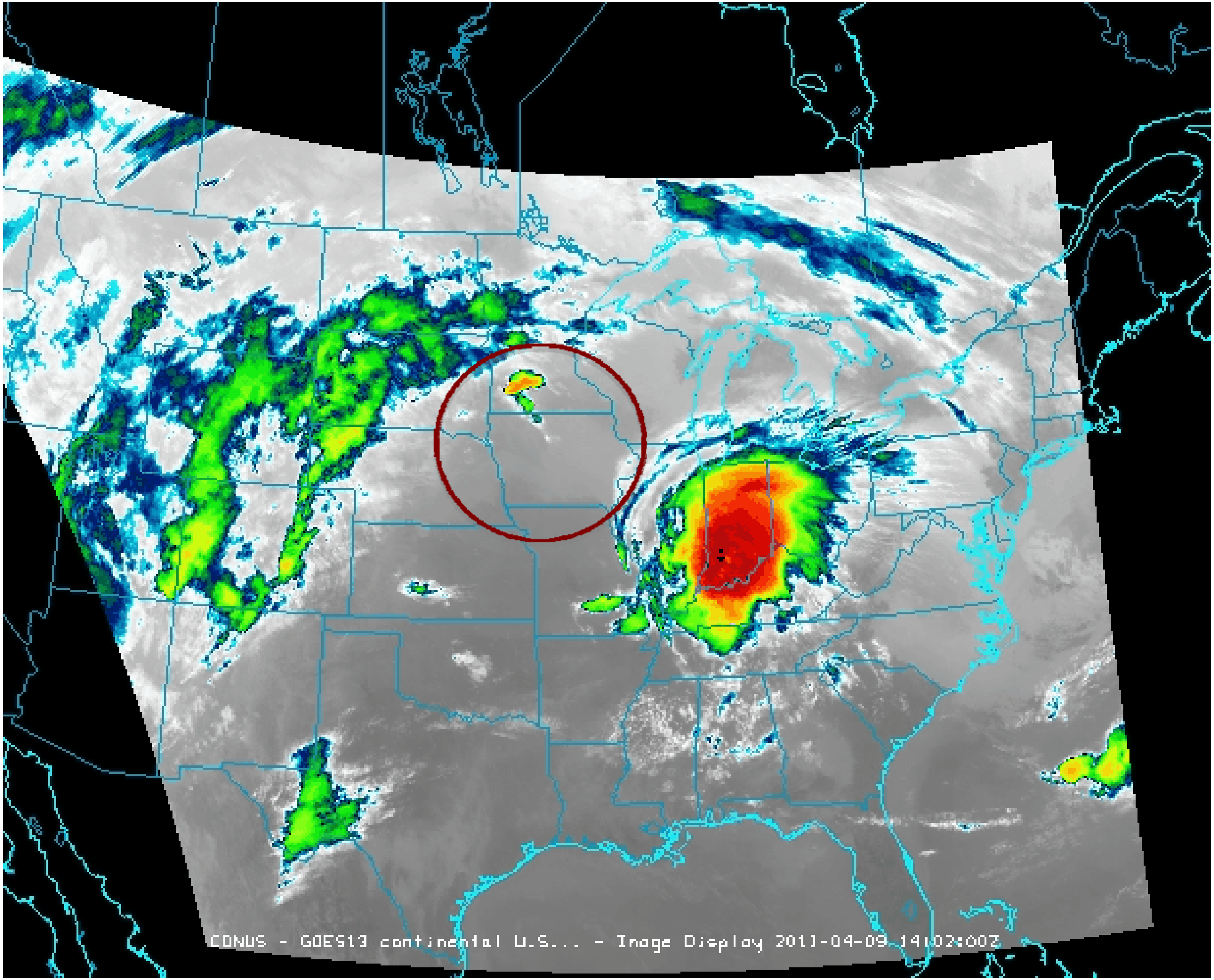
- Note that Upper-Level dry air moves over same area precisely at time of convection initiation
    - Especially obvious with 17z and 20z runs

- Also note the activity through North and South Carolina with very large hail.
    - This is associated with a push of high Lower-Level Theta-E and instability into a previously stable area.

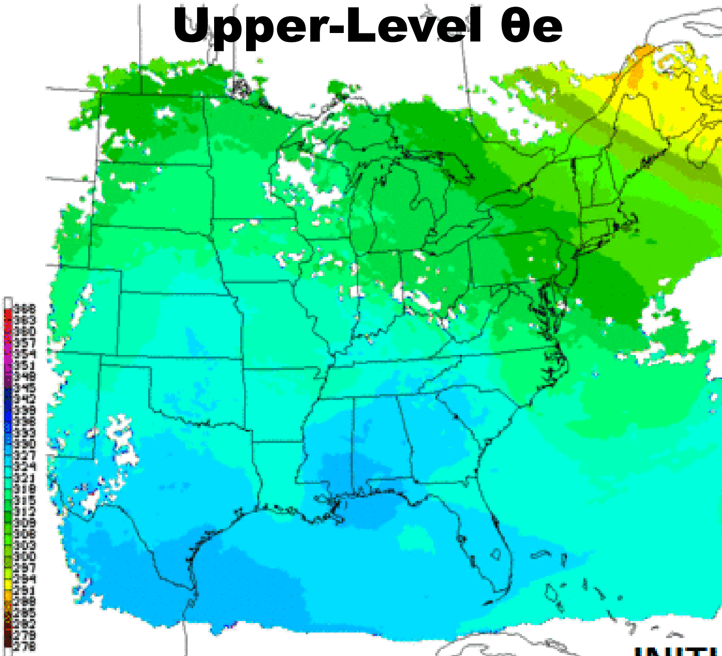
April 9, 2011 – Mapleton, IA (western Iowa)



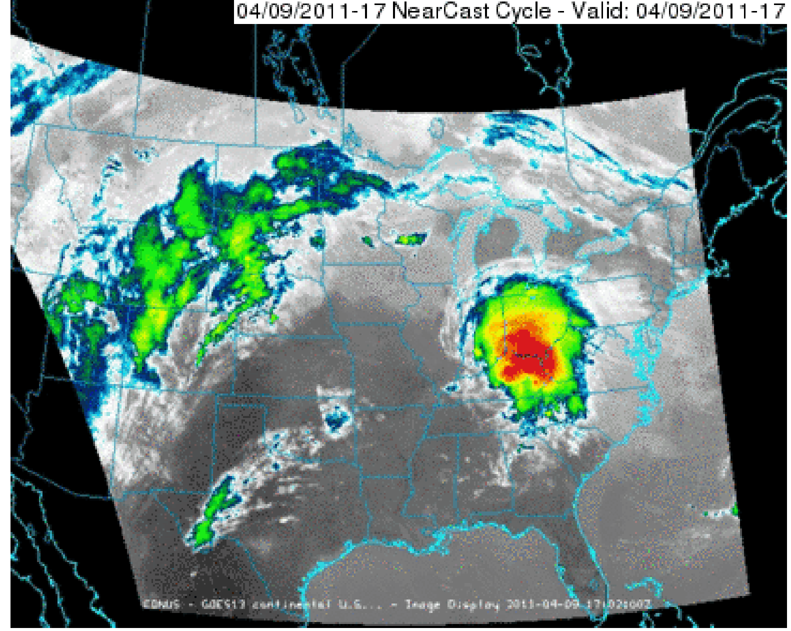
April 9, 2011 – Mapleton, IA (western Iowa)



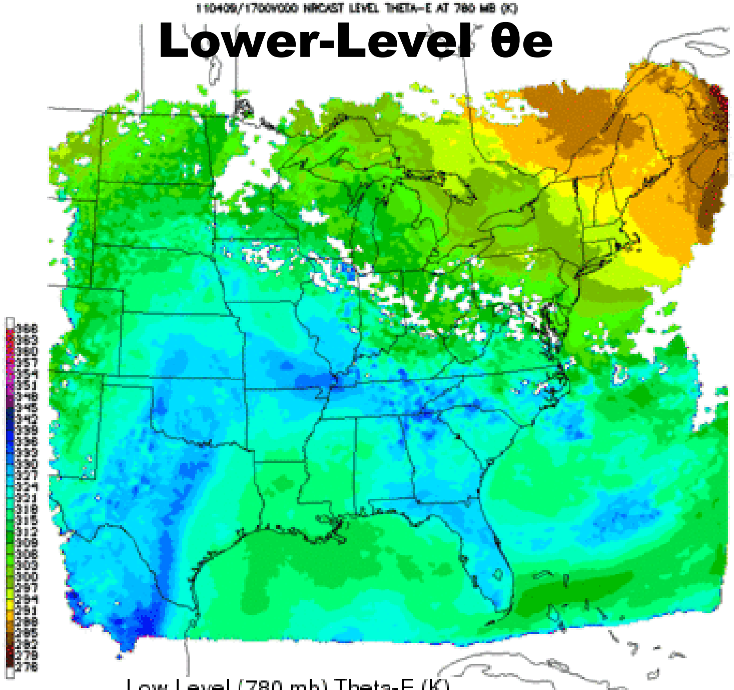
April 9, 2011 – Mapleton, IA (western Iowa)



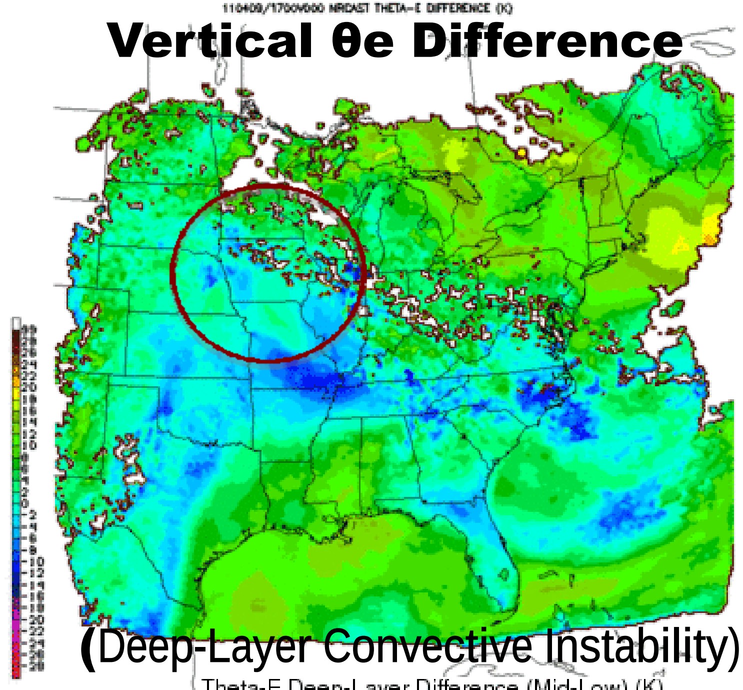
Mid Level (500 mb) Theta-E (K)



INITIALIZED: 17 z | **VALID:** 17 z



Low Level (780 mb) Theta-E (K)



(Deep-Layer Convective Instability)

Theta-E Deep-Layer Difference (Mid-Low) (K)

Note: Images that follow are from NearCasting web site

June 08, 2011- Southern Wisconsin

- Convection begins about 00Z
    - Confined to a SW to NE oriented strip of moisture moving NE through southern Wisconsin

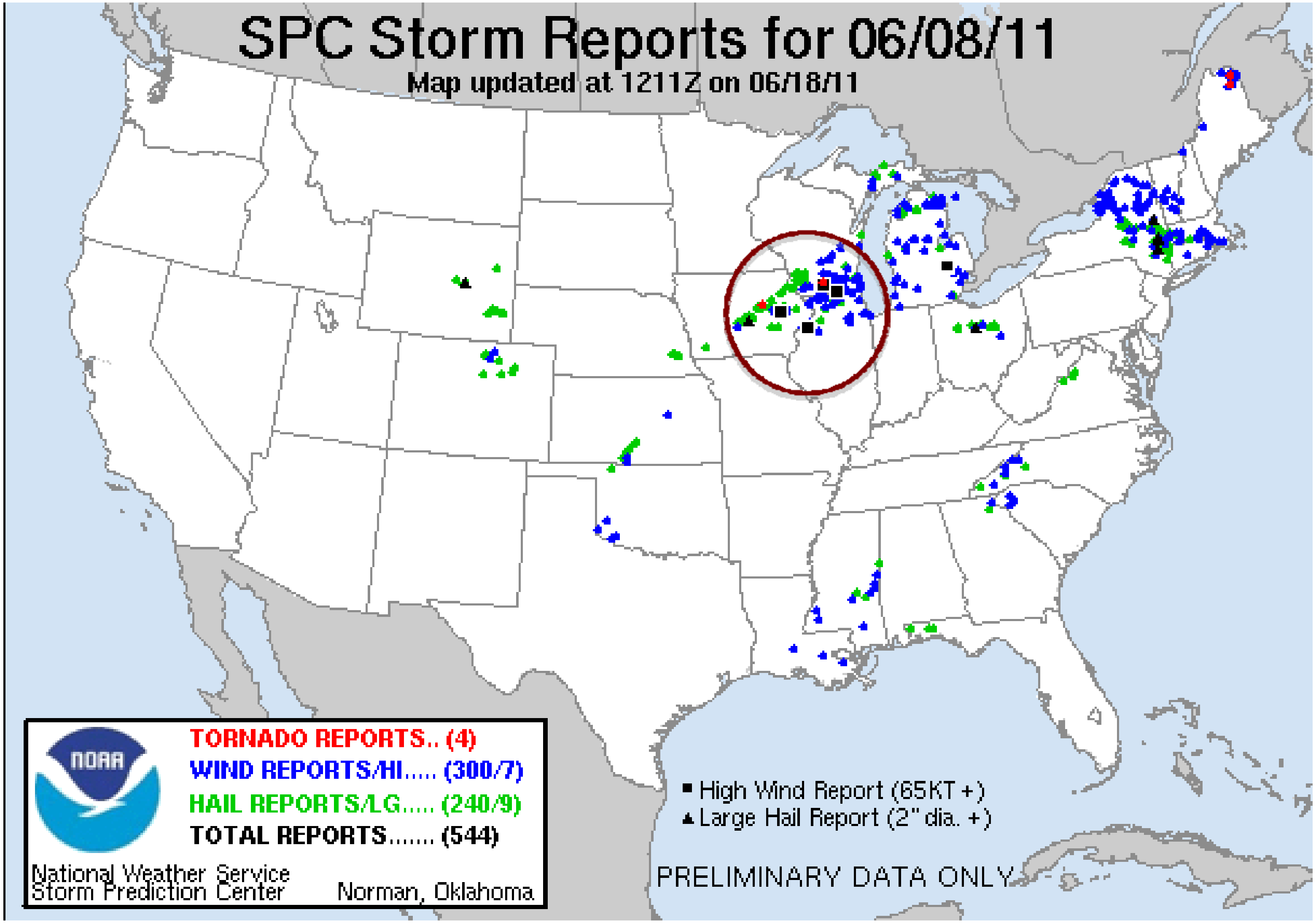
- Upper-Level dry air pushes east over this band of moisture setting off convection.

- By 02Z, the satellite loop show the deepest convection (darkest reds) moving SE within the large cloud shield, in the direction of the Upper-Level dry boundary.

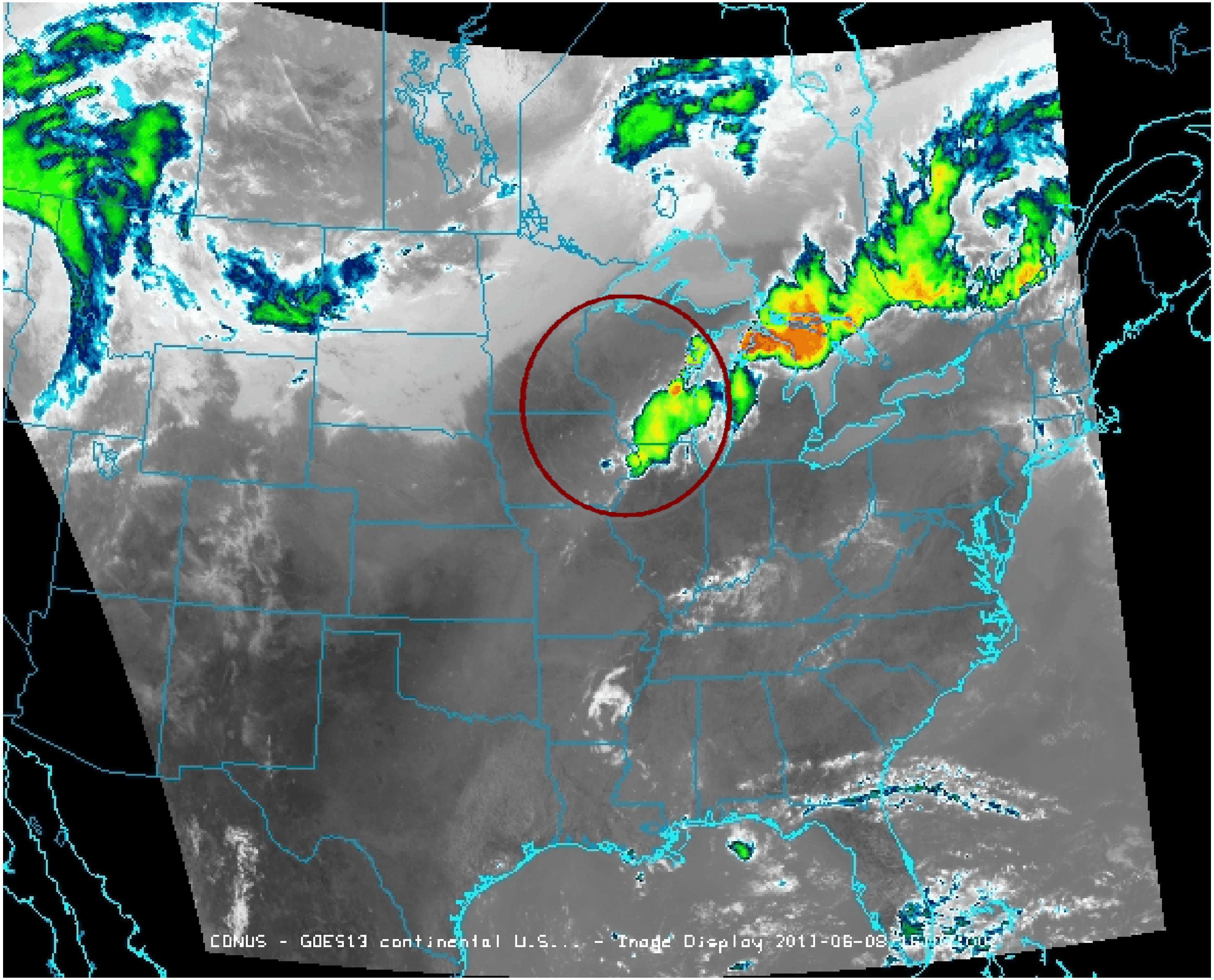
- Precipitable Water loops useful here as well as θe

- SPC reports document large hail and strong winds with these storms and several tornadoes

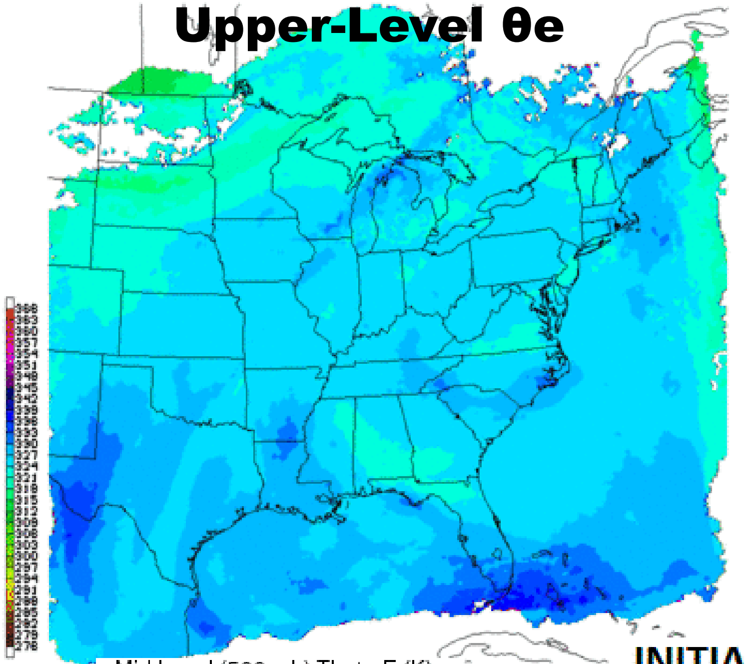
June 08, 2011- Southern Wisconsin

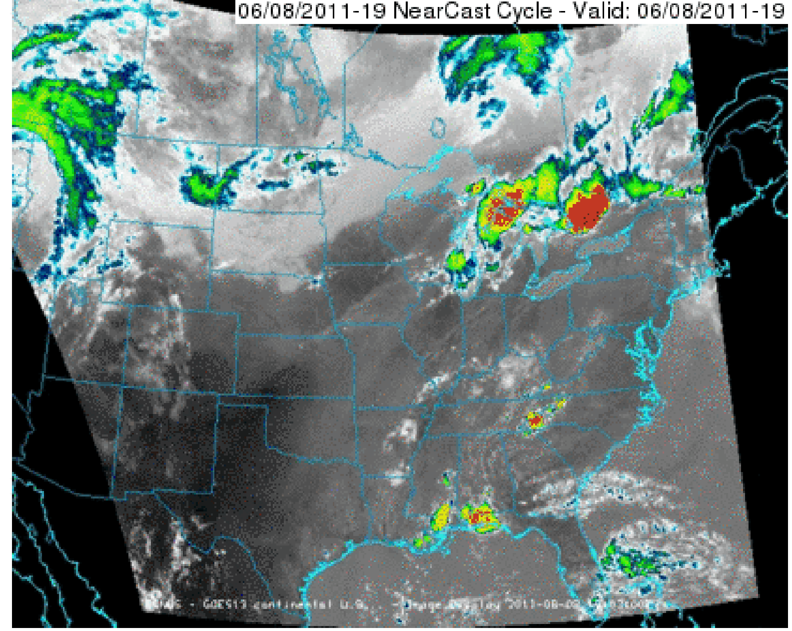


June 08, 2011- Southern Wisconsin

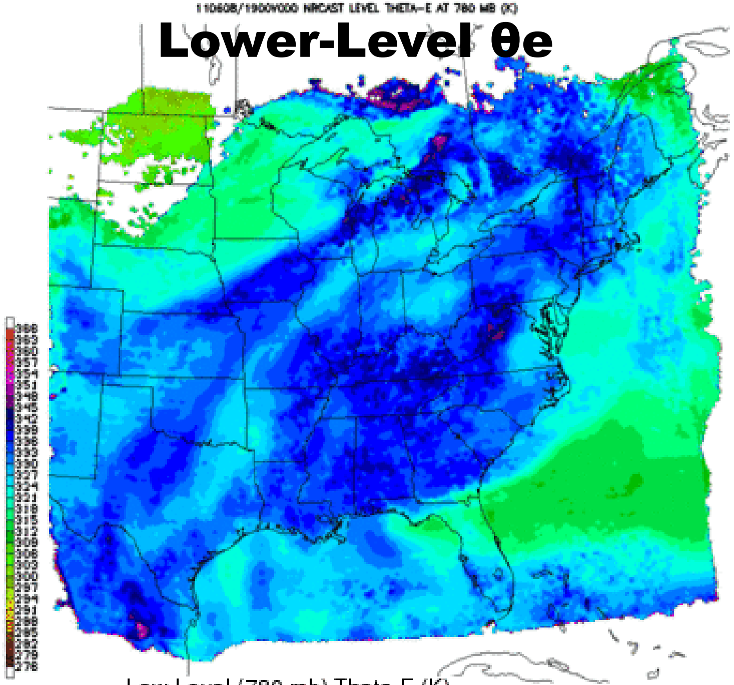


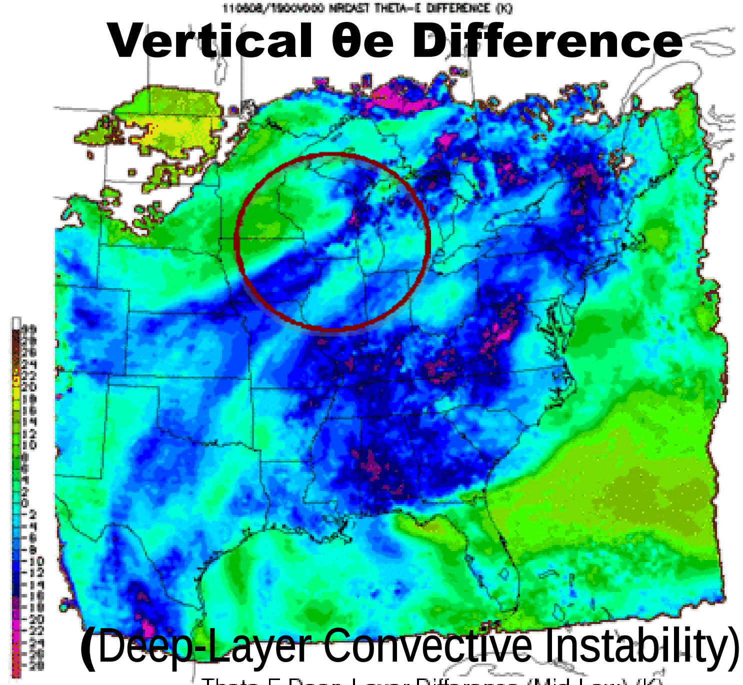
June 08, 2011- Southern Wisconsin





INITIALIZED: 19 Z | VALID: 19 Z





August 17, 2011 – Central So. Dakota / north-cent. Nebraska

•Convection begins after 22z along leading edge of Upper-level dry air as it moves over N-S oriented strip of moisture which itself is moving north.

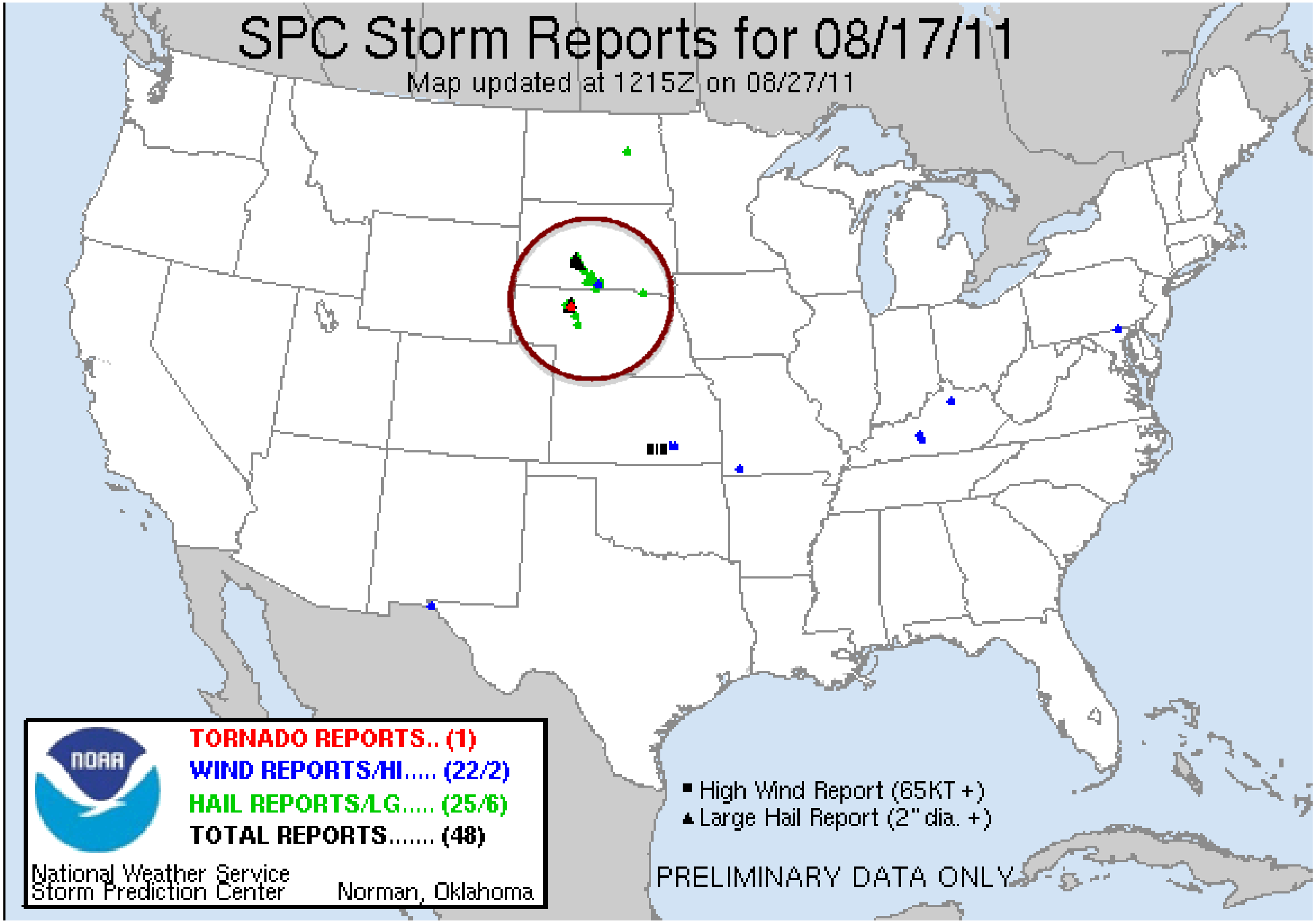
•Once this leading edge passes through the moisture, the storms quickly die as they have lost their moisture source.

•NearCasts indicated that these storms would dissipate just as quickly as they developed.

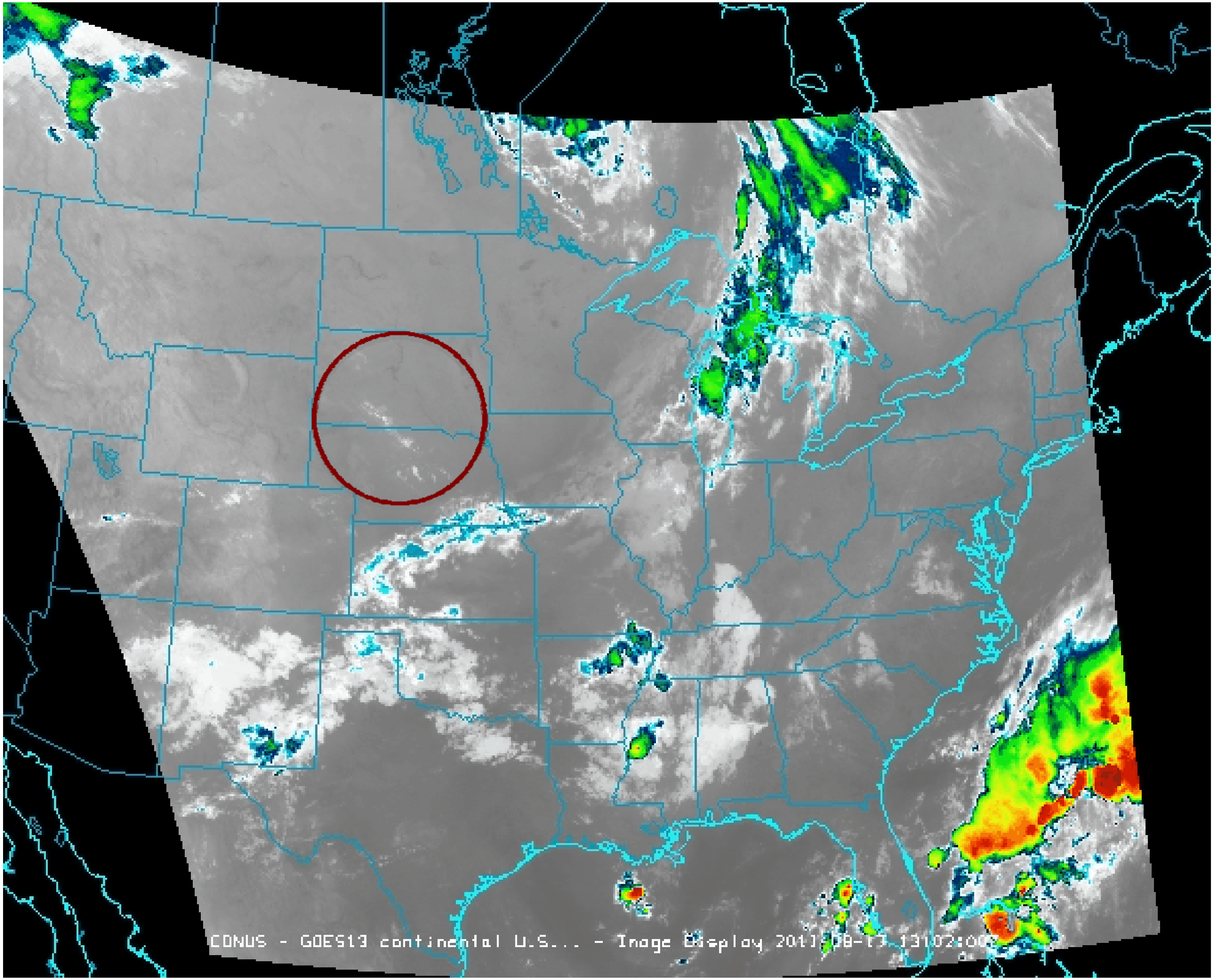
•Precipitable Water data show the dry air moving over the strip of moisture from the west, then exiting to the east.

•SPC documents that at least 2 of these storms produced severe weather

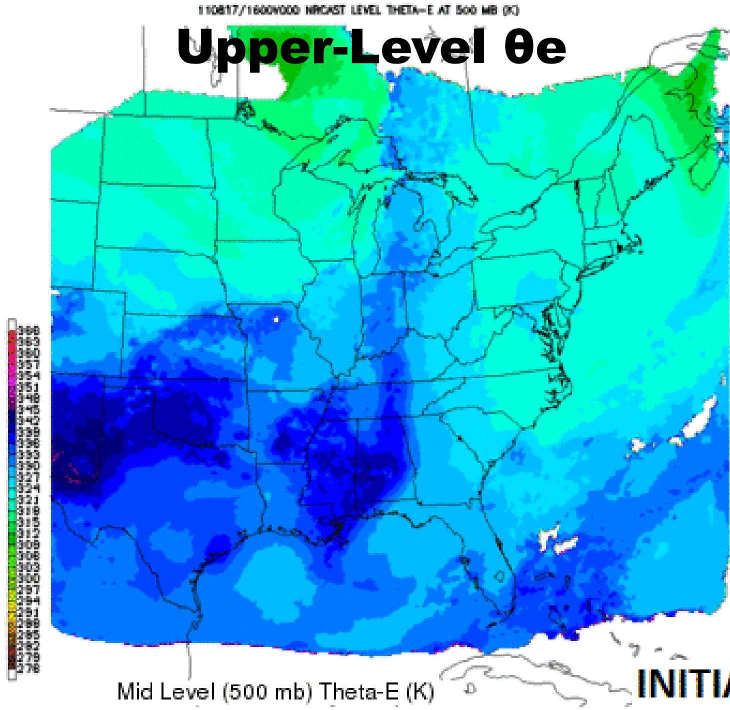
August 17, 2011 – Central So. Dakota / north-cent. Nebraska

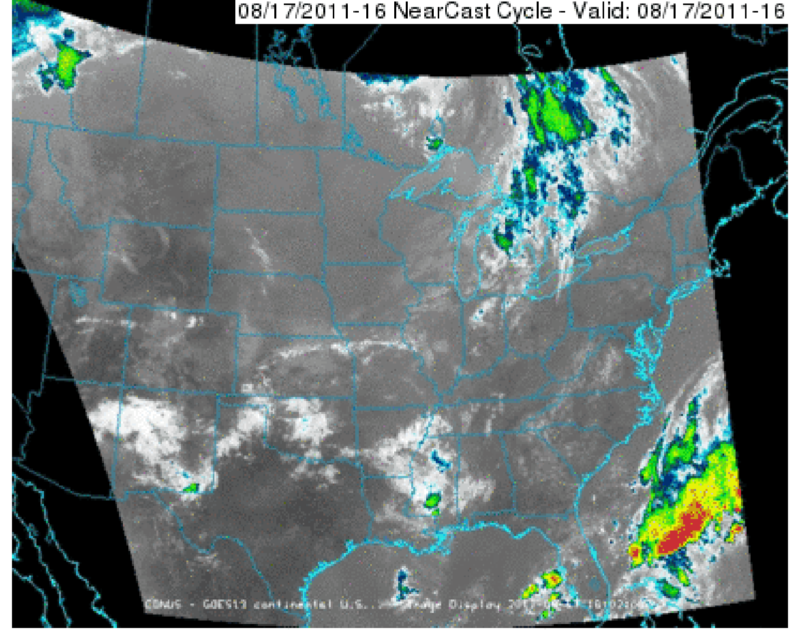


August 17, 2011 – Central So. Dakota / north-cent. Nebraska

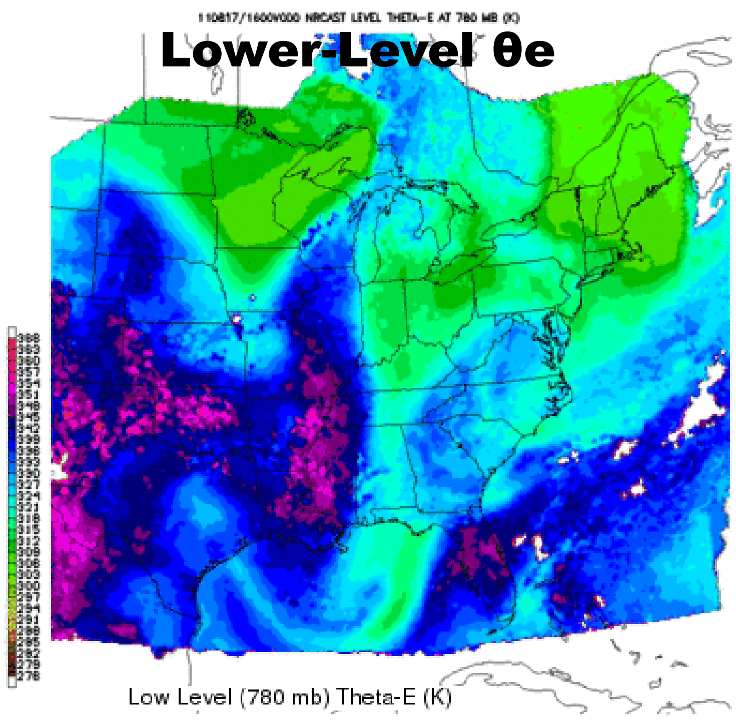


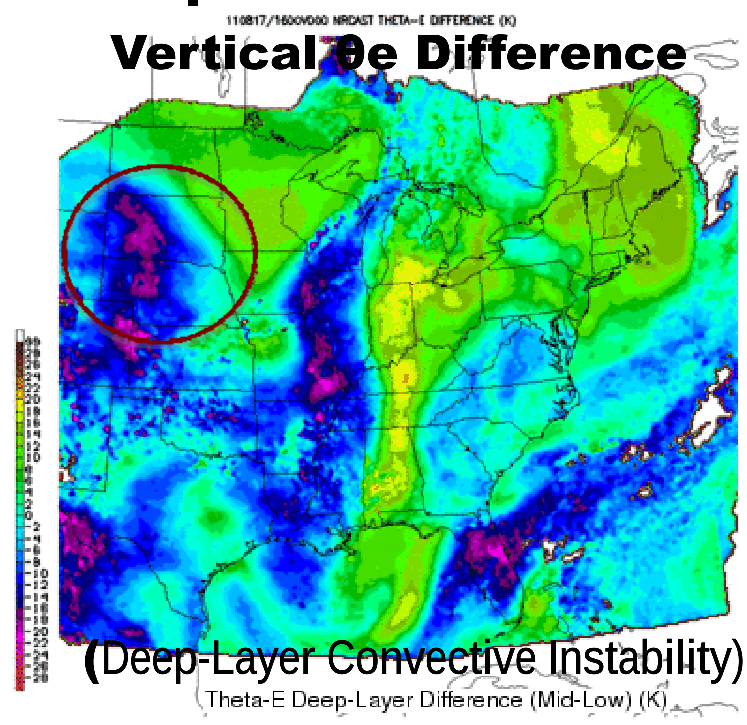
August 17, 2011
Central So. Dakota / north-central Nebraska



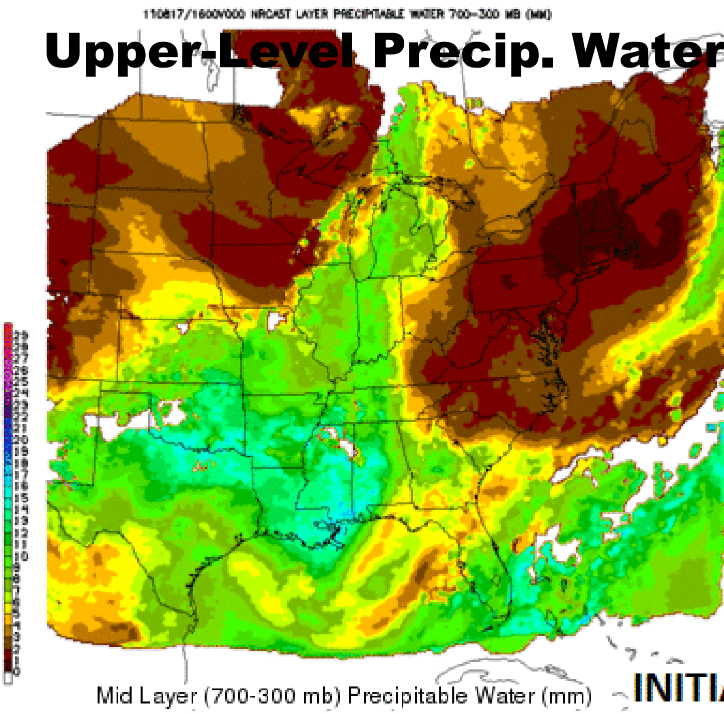


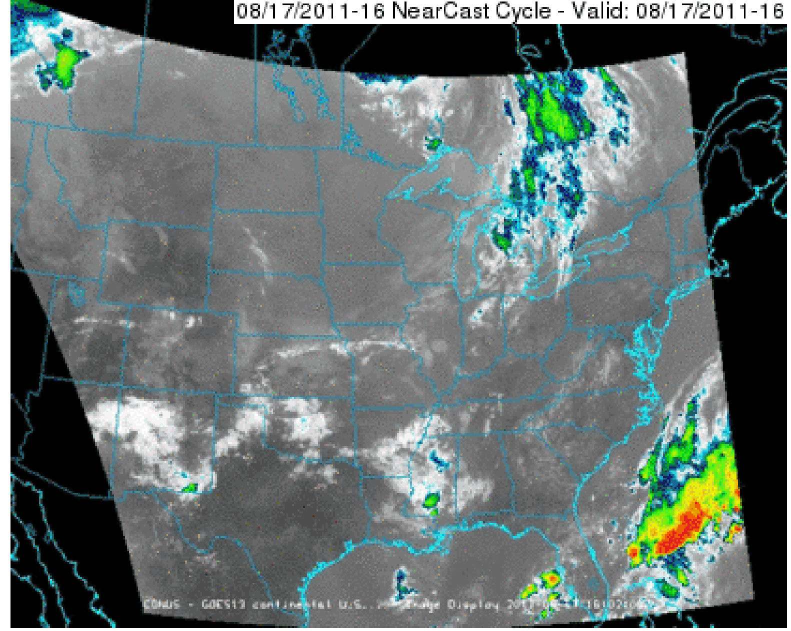
INITIALIZED: 16 z | VALID: 16 z



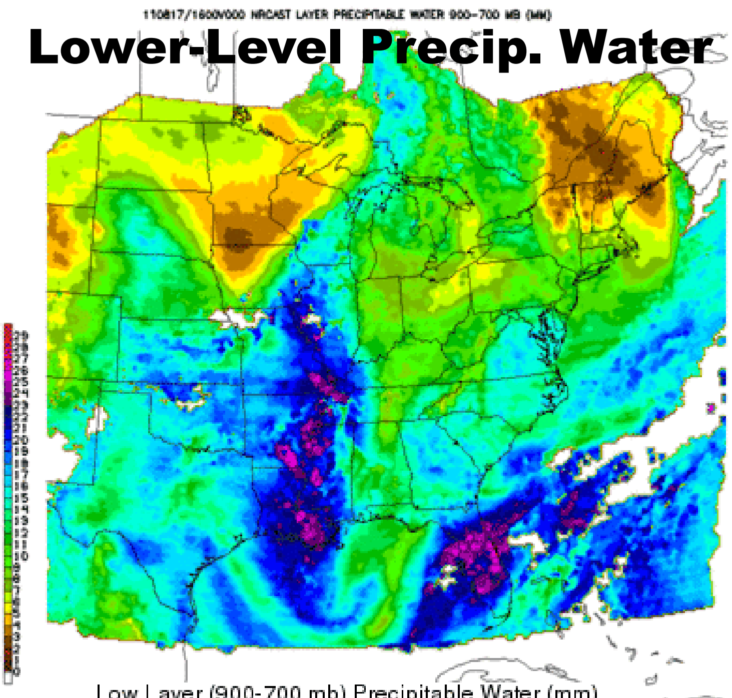


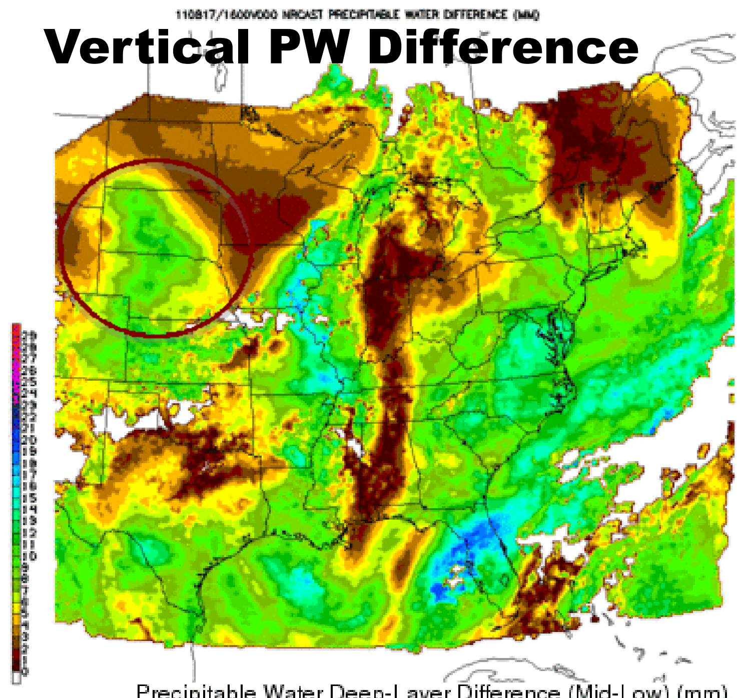
August 17, 2011
Central So. Dakota / north-central Nebraska

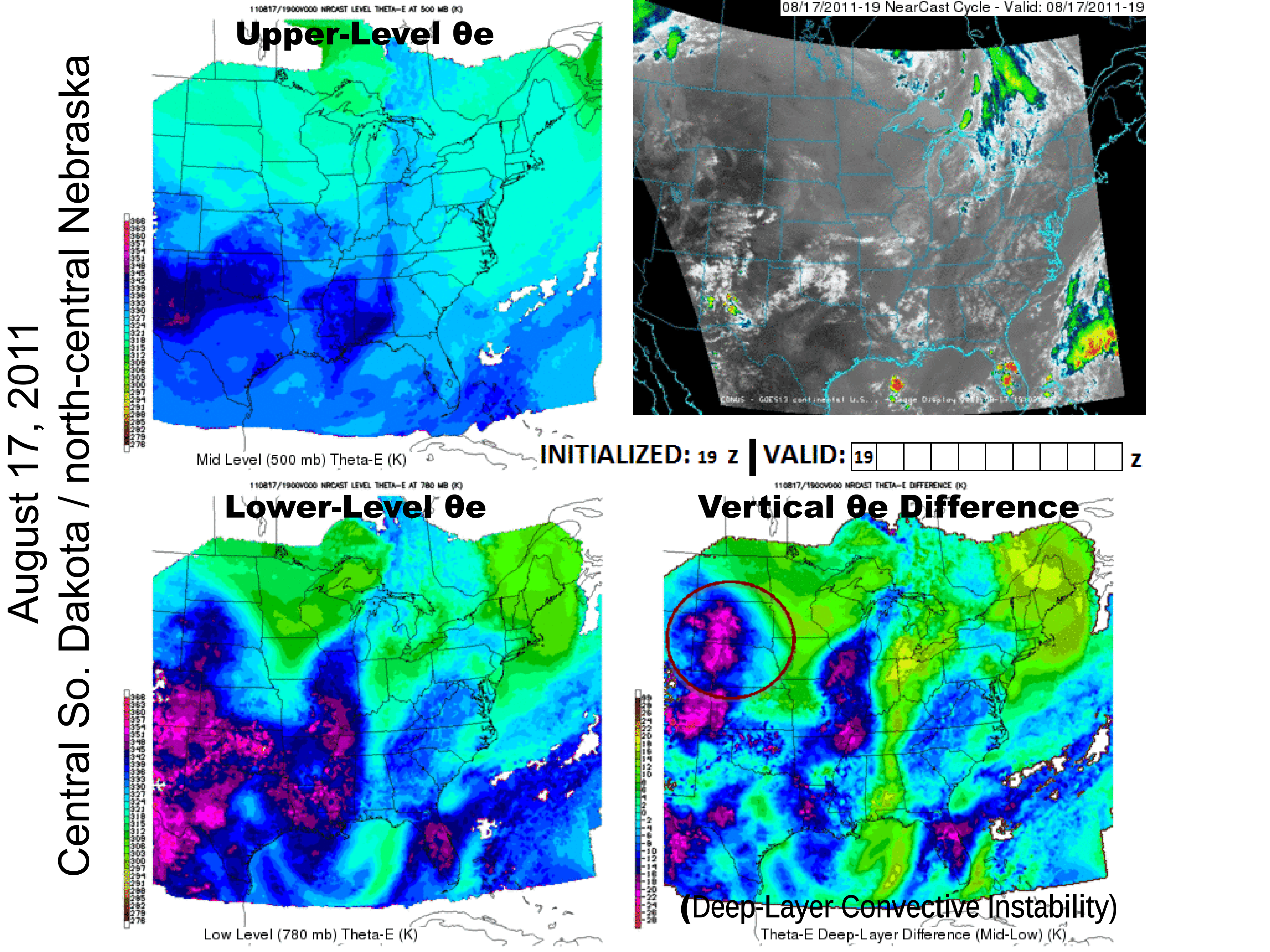




INITIALIZED: 16 Z | VALID: 16 Z






August 17, 2011
Central So. Dakota / north-central Nebraska
Upper-Level θe
Mid Level (500 mb) Theta-E (K)
08/17/2011-19 NearCast Cycle - Valid: 08/17/2011-19
INITIALIZED: 19 Z | VALID: 19 Z
Lower-Level θe
Low Level (780 mb) Theta-E (K)
Vertical θe Difference
(Deep-Layer Convective Instability)
Theta-E Deep-Layer Difference (Mid-Low) (K)

Feb 28-29, 2012 – Branson, MO (south central MO)

- Tornado struck Branson about 07Z on the 29th
  - *In the middle of night when most people were asleep*
    - *Early warning would have reduced injuries*

- NearCasts showed a maximum in Convective Instability moving through southern MO - precisely along the path of some of the deepest convection.

- Upper-level θe loop shows the dry air moving over the strip of moist LL air

- SPC reported many severe storms along the path of this edge of instability.

Feb 28-29, 2012 – Branson, MO (south central MO)

(AP)

Feb 28-29, 2012 – Branson, MO (south central MO)

(Denver Post)

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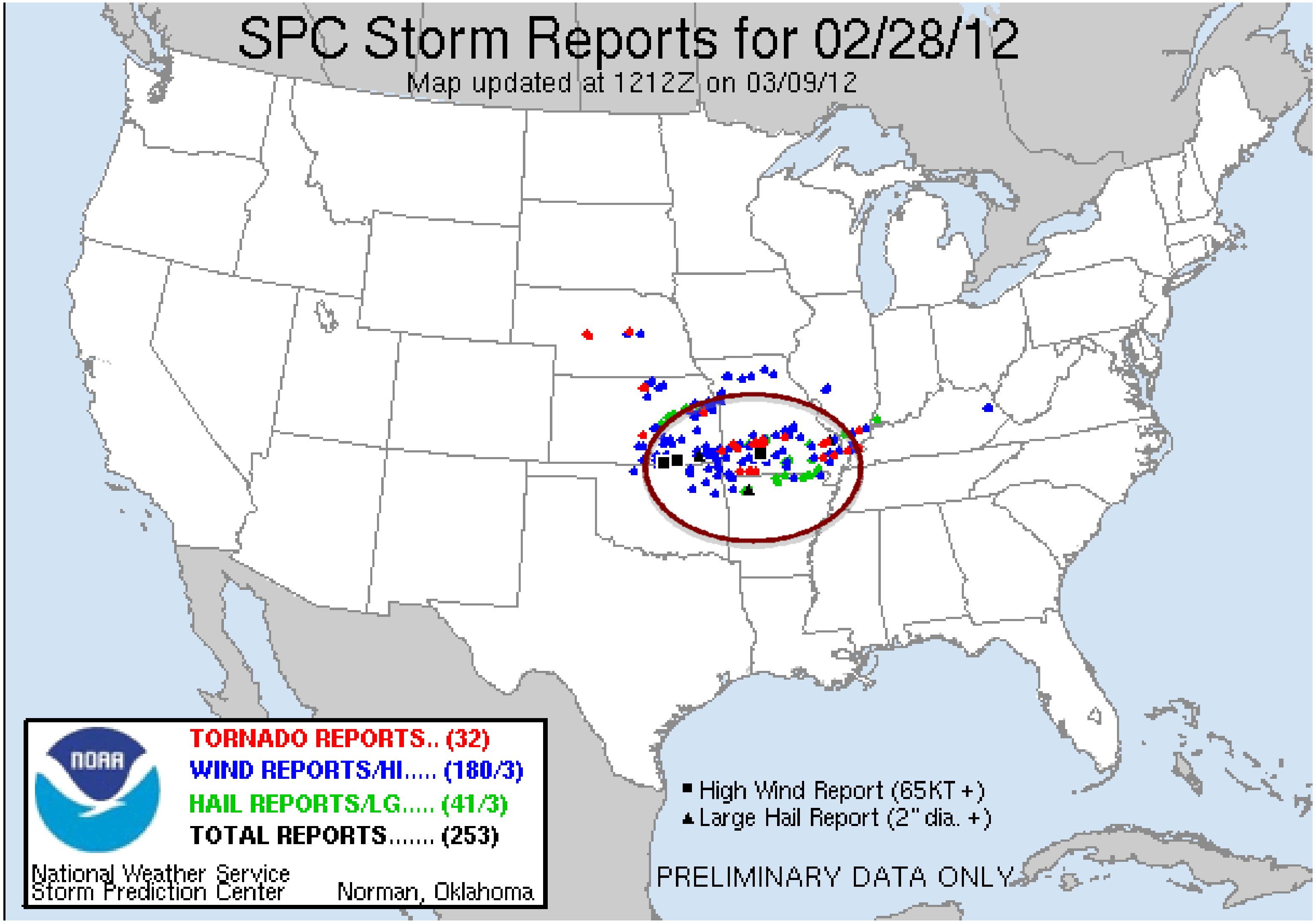
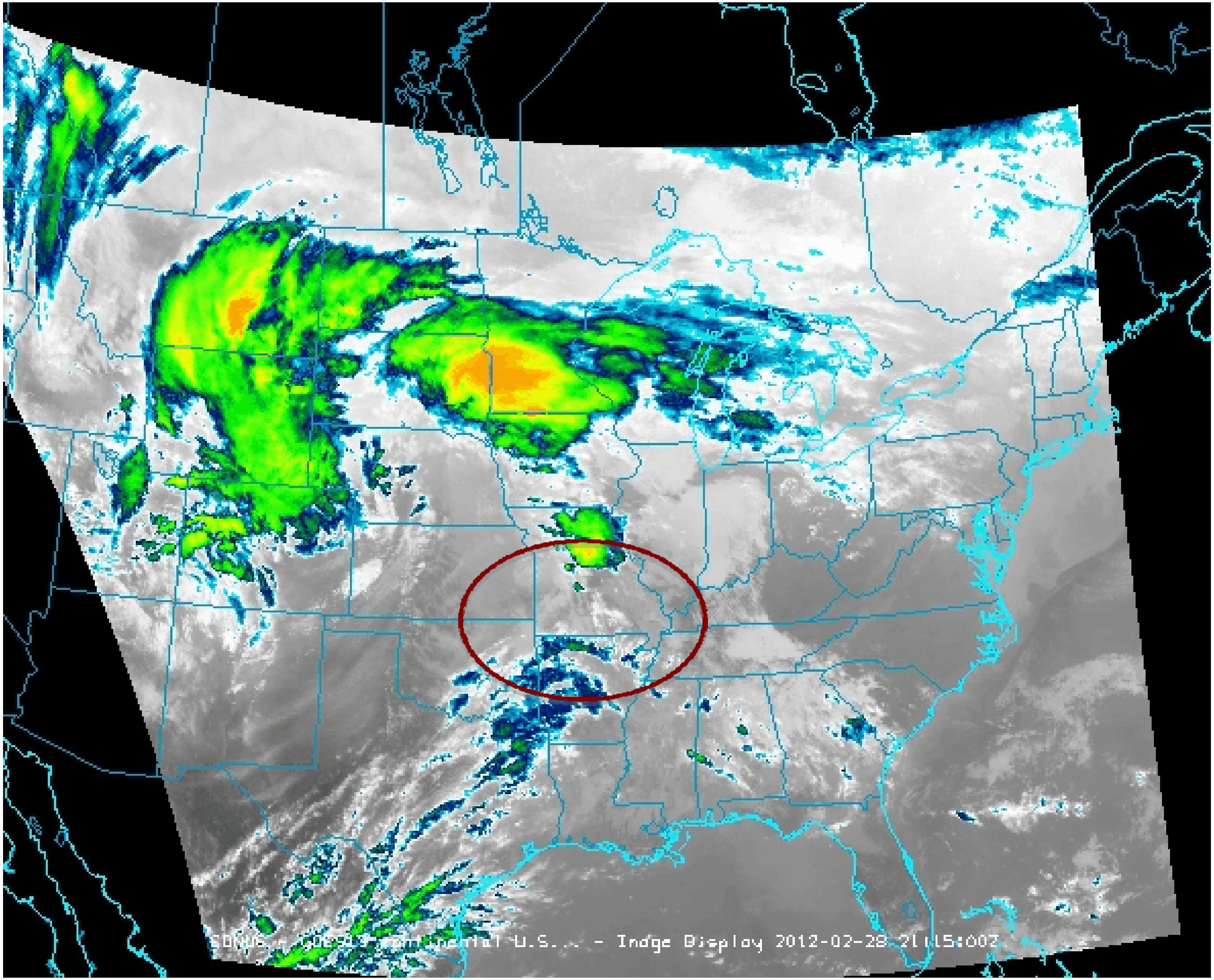
Feb 28-29, 2012 – Branson, MO (south central MO)



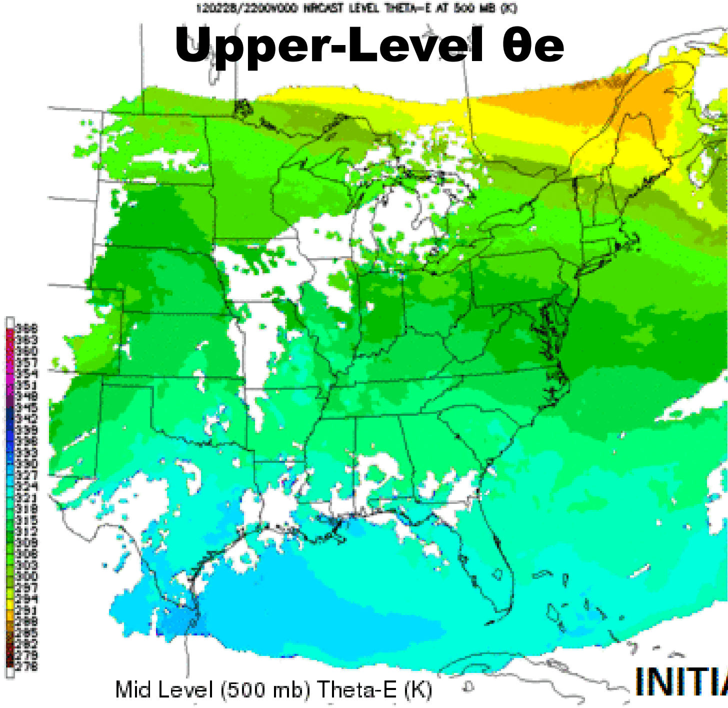
Feb 28-29, 2012 – Branson, MO (south central MO)

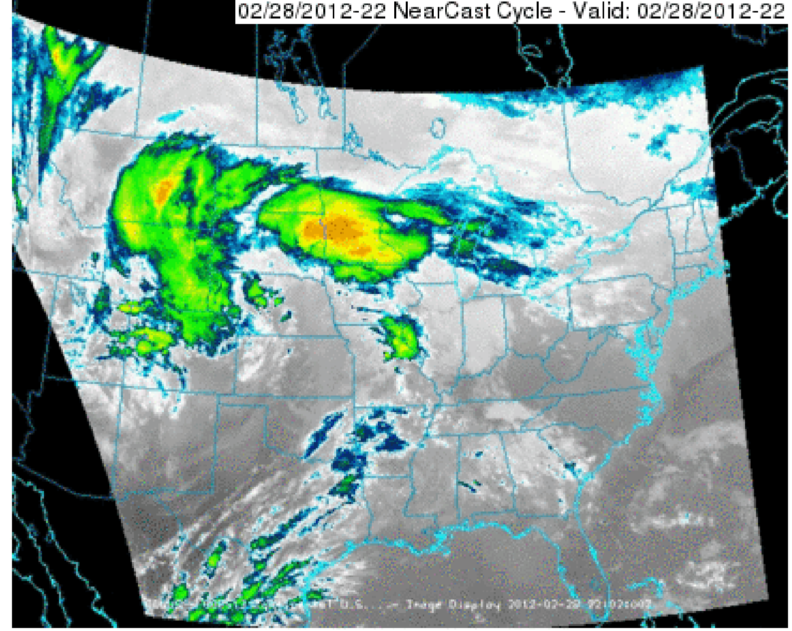


Feb 28-29, 2012

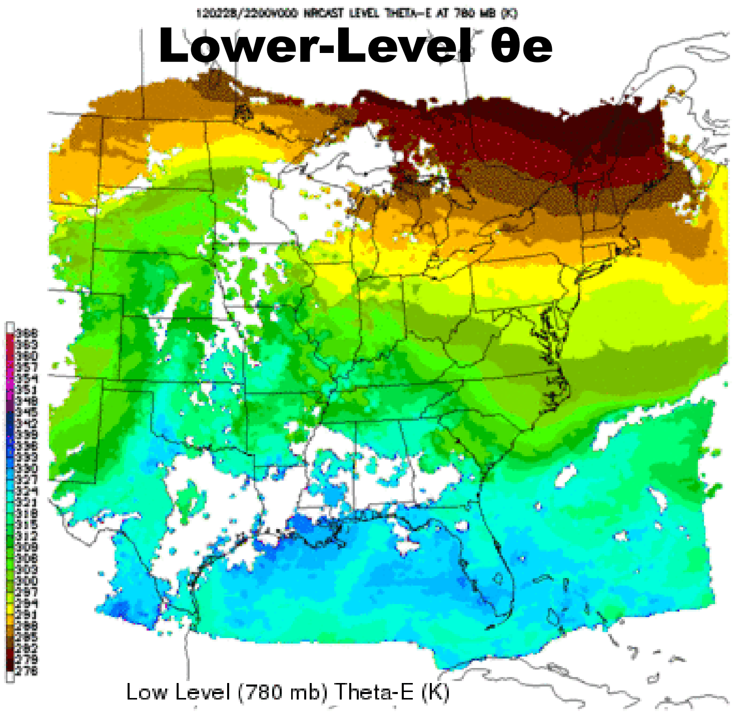
Branson, Missouri (south central MO)

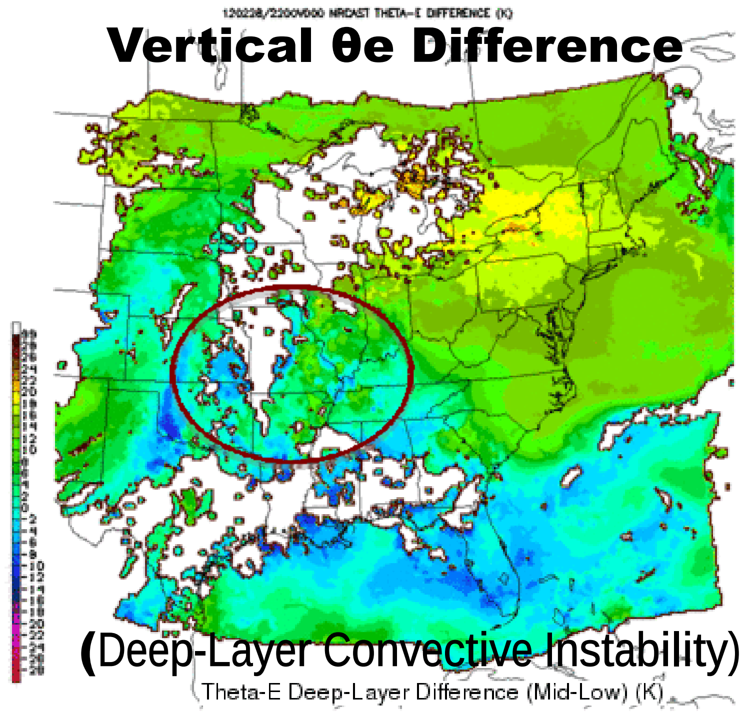
Using Li Retrievals – like SEVIRI





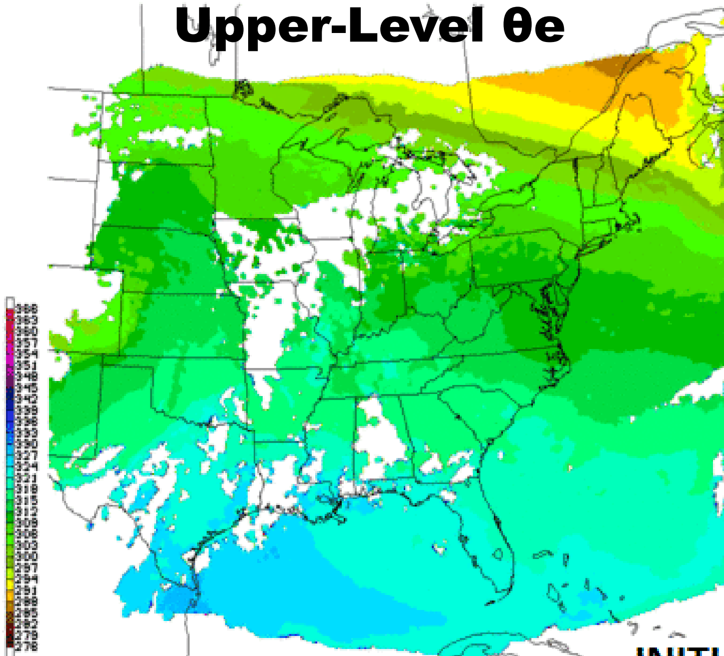
INITIALIZED: 22 z | VALID: 22 z



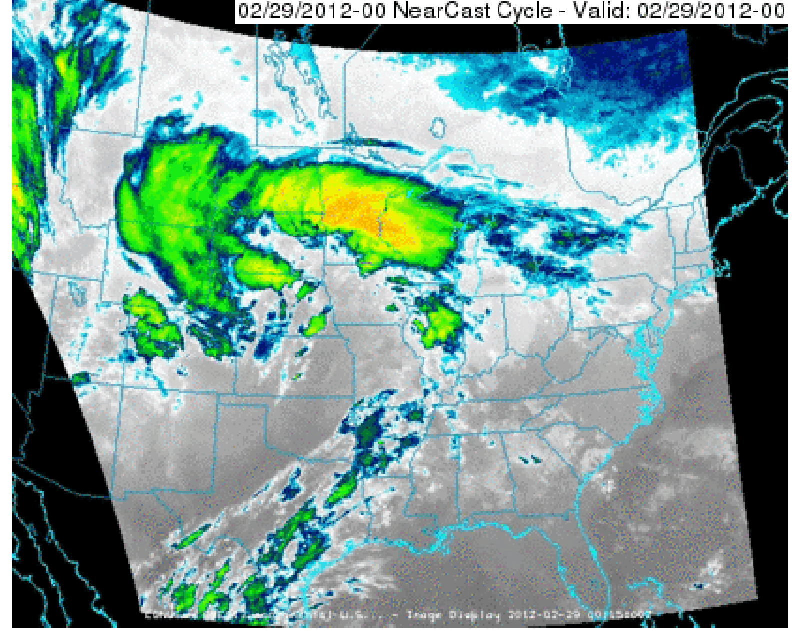


Feb 28-29, 2012
Branson, Missouri (south central MO)

Upper-Level θe

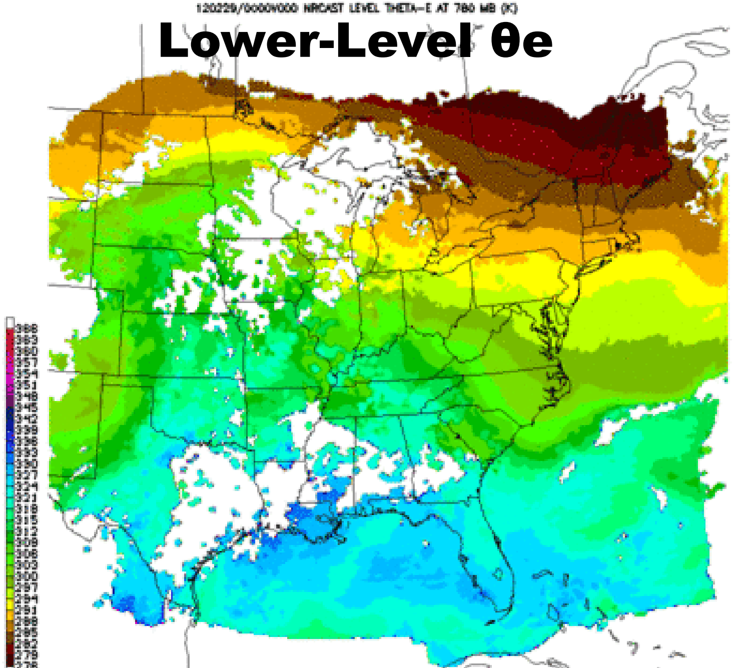


Mid Level (500 mb) Theta-E (K)



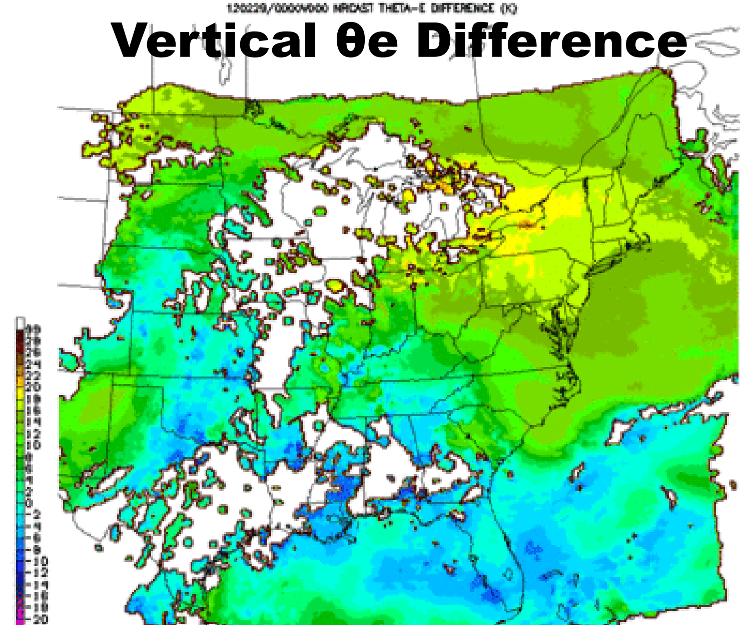
INITIALIZED: 00 z | VALID: 00 z

Lower-Level θe



Low Level (780 mb) Theta-E (K)

Vertical θe Difference



(Deep-Layer Convective Instability)

Theta-E Deep-Layer Difference (Mid-Low) (K)

Using Li Retrievals – like SEVIRI

NearCasting Recap

- Nearcasts successfully provide short-range forecasts of timing and locations of severe thunderstorms, especially for hard-to-forecast, isolated summer-time convection when NWP systems have least skill

NearCast 1-9 hour forecasts allow forecasters to quickly monitor where hazardous weather will (or will not) form.

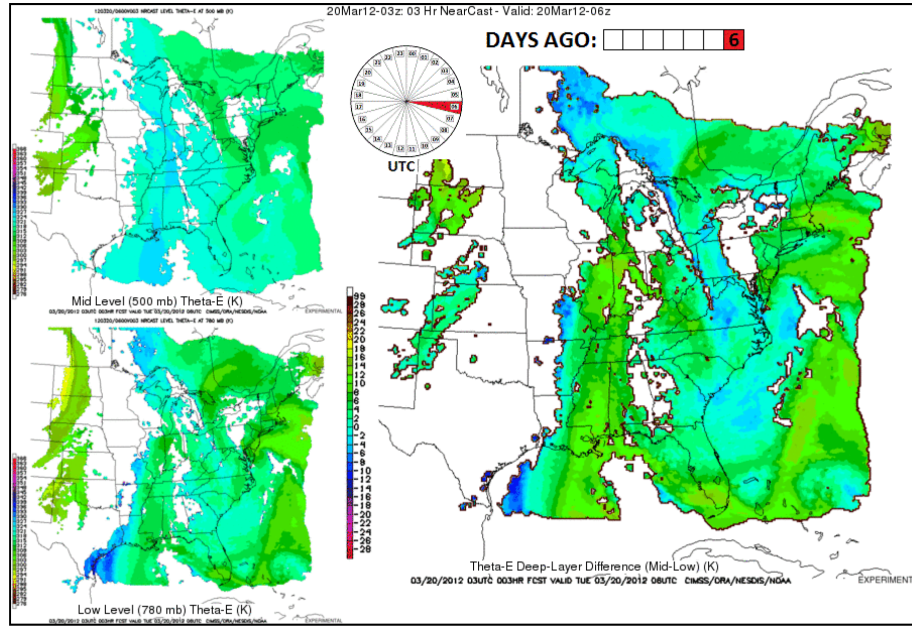
NearCasts are:

- Useful in improving subjective forecasting

- ***Available within minutes of observation times,***
- ***Are frequently updated (hourly or sub-hourly), and***
- ***Rely on quality GOES sounder observations that are not included over land in traditional NWP systems***
- ***Valuable tools for forecasters to validate and enhances upon NPW and ensemble products***
- ***- Show the potential of GOES-R***

What Next?

[Exposing Forecasts to satellite NearCasts]



[6 day loop of previous 6-hr NearCasts]

NearCast Model has been modified to run anywhere on the globe

- Uses NCEP GFS data for Heights and initial Winds

- Output as web pages or GRIB-II

Recommend test and evaluate over Europe/Africa using SEVIRI sounding

- ***Options to get SEVIRI data from Eumetsat or CIMSS***
  - ***Eumetsat is preferable since we would test operational products***
- ***Need to define areas to perform evaluations***
- ***Need volunteers for testing (Poland has expressed interest already)***

C I M S S