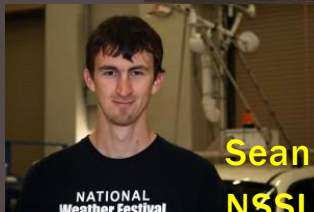




IMPACT OF MPEX UPSONDE DATA ASSIMILATION ON SHORT-TERM FORECASTS OF CONVECTION



Mike Coniglio
Kent Knopfmeier
Stacey Hitchcock
NSSL



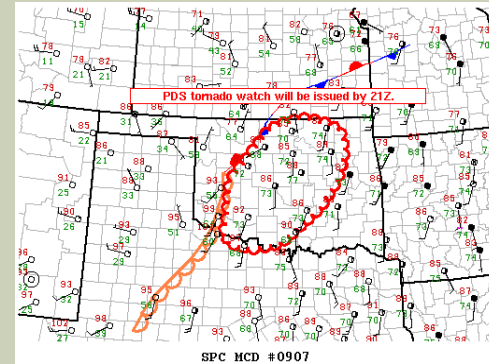
Sean Waugh
NSSL



MOTIVATION FOR MY MPEX PARTICIPATION

■ NSSL/SPC collaborations:

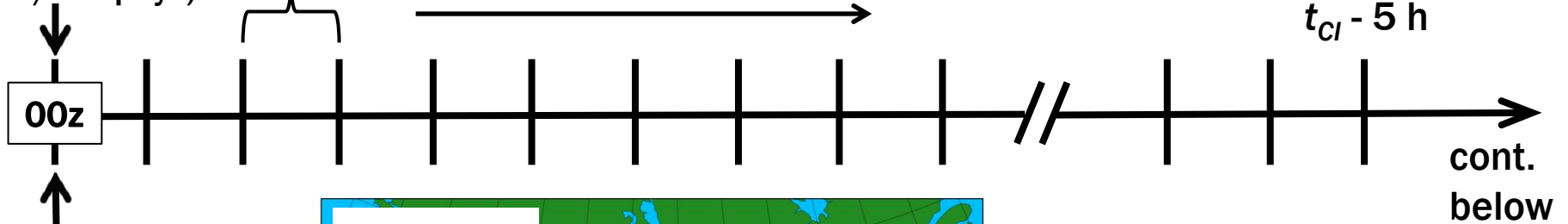
- Probabilistic information void on time scales < 24 h
- Mesoscale Discussions
- Watches



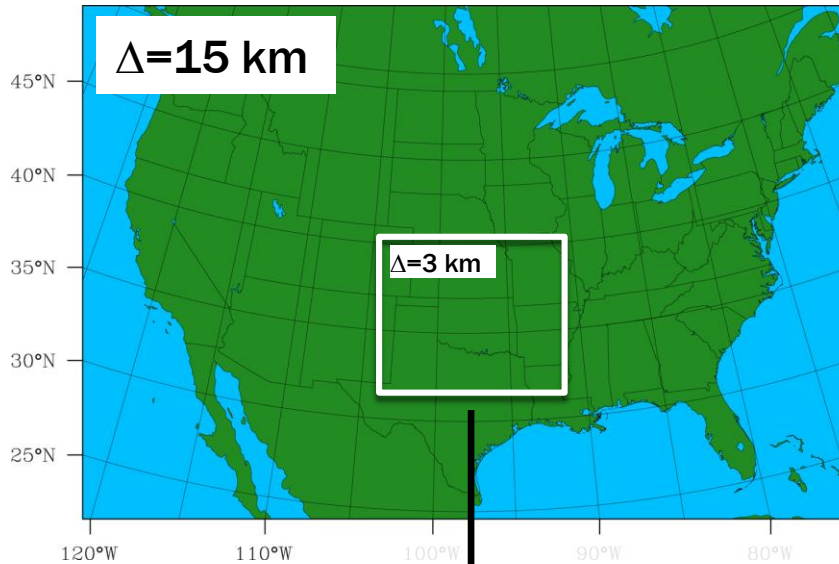
- Can we issue “probabilistic watches” out earlier than current watches, or even before MDs with skill?
- Need to improve storm-scale ensemble guidance....*will assimilation of targeted soundings help on 1 - 12 h time scales? WRF-DART experiments*

WRF-DART EXPERIMENT STRATEGY

WRF 3.4.1,
36 mems,
18 GEFS
IC/LBCs (x 2
w/diff phys)

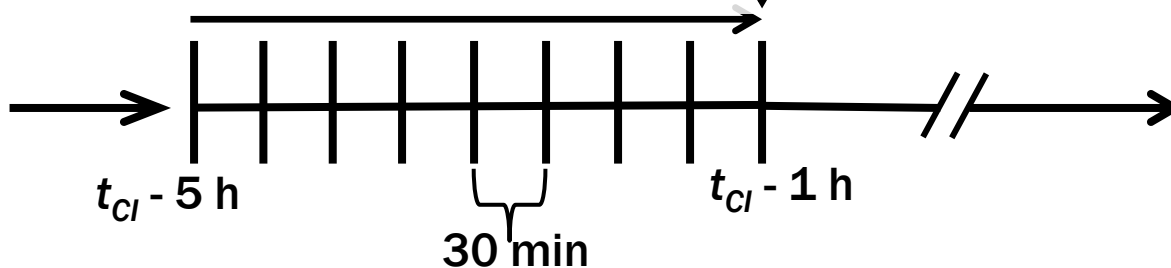


RAP soil data



- Chunk data into half-hour intervals \rightarrow balloon drift
- Play with localization radii for upsonde data

Above plus mesonet **plus MPEX upsondes**



**6 - 9 h forecast
on 3-km grid.....CTRL**

t_{CI} = time of
conv initiation

$t_{CI} - 5$ h

cont.
below

Date	Region	Storm Type	# pre storm	# near storm
May 15	Northern TX	Tornadic supercell	2	3
May 16	Western KS	Non-severe convective system	0	6
May 18	Western KS	Tornadic supercells	5	7
May 19	Central OK	Tornadic supercells	3	12
May 20	Central OK	Tornadic to non-tornadic supercell	3	15
May 23	Western TX	Tornadic supercell to convective system	4	16
May 27	Central KS	Tornadic and a weak supercell	9	12
May 28	Central KS	Tornadic supercell and convective system	5	14
May 29	TX/western OK	Convective system/bow echo	2	18
May 30	Central OK	Non-tornadic supercell	2	26!
May 31	Central OK	Tornadic supercell to convective system	3	14
June 3	SW KS/OK panhandle	Non-tornadic supercell to bow echo	2	18
June 4	TX panhandle	Dryline, no storms	15	0
June 8	SW KS/NW OK/TX pan	Squall line w/embedded supercells	5	14
June 11	Nebraska	Weak storms, then supercell late	10	10
June 12	SE Wyoming	Upslope flow, no storms	15	0
June 14	Nebraska/NW KS	Squall line	4	4
TOTAL			89	189

MAY 15TH TORNADIC SUPERCELLS

MAY 15TH TORNADIC SUPERCELLS

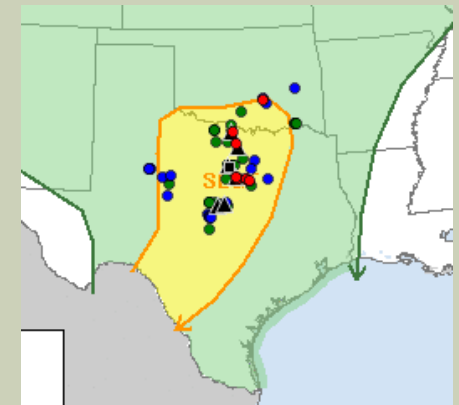
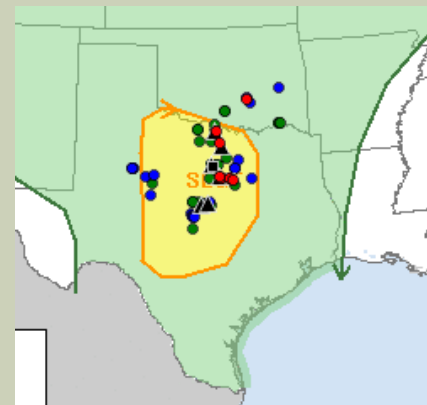
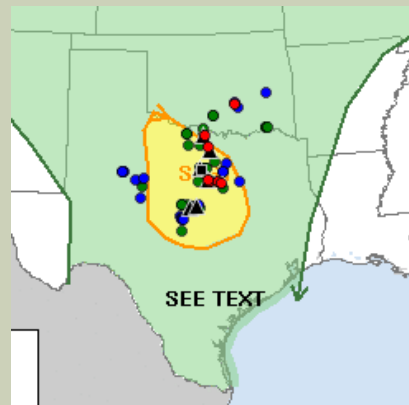
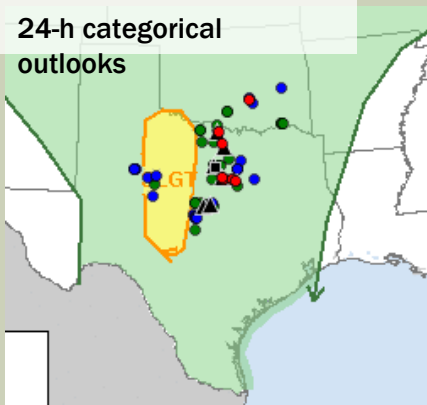
0600Z

1300Z

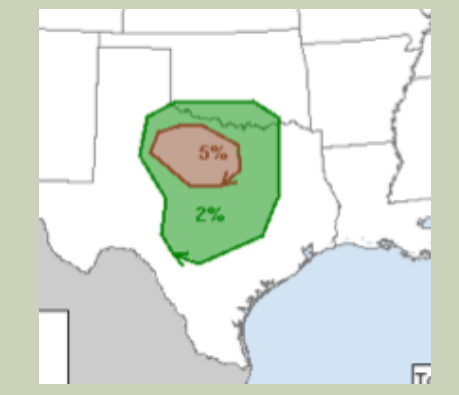
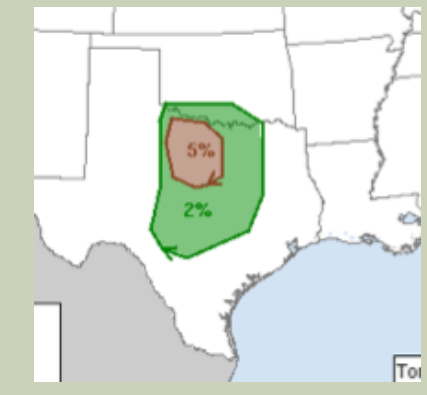
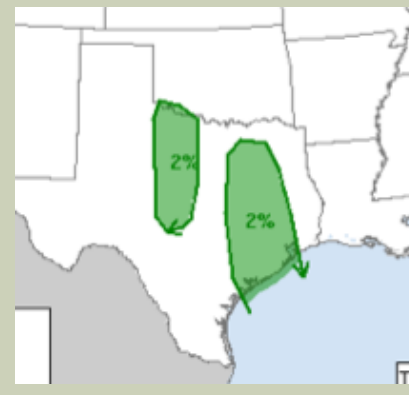
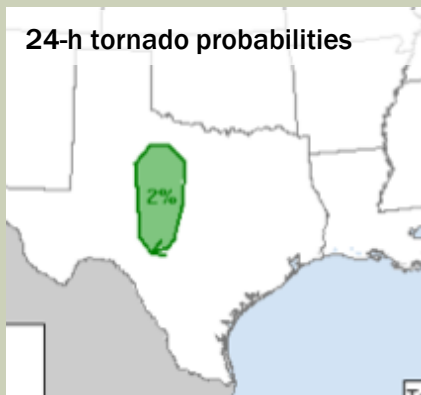
1630Z

2000Z

24-h categorical outlooks

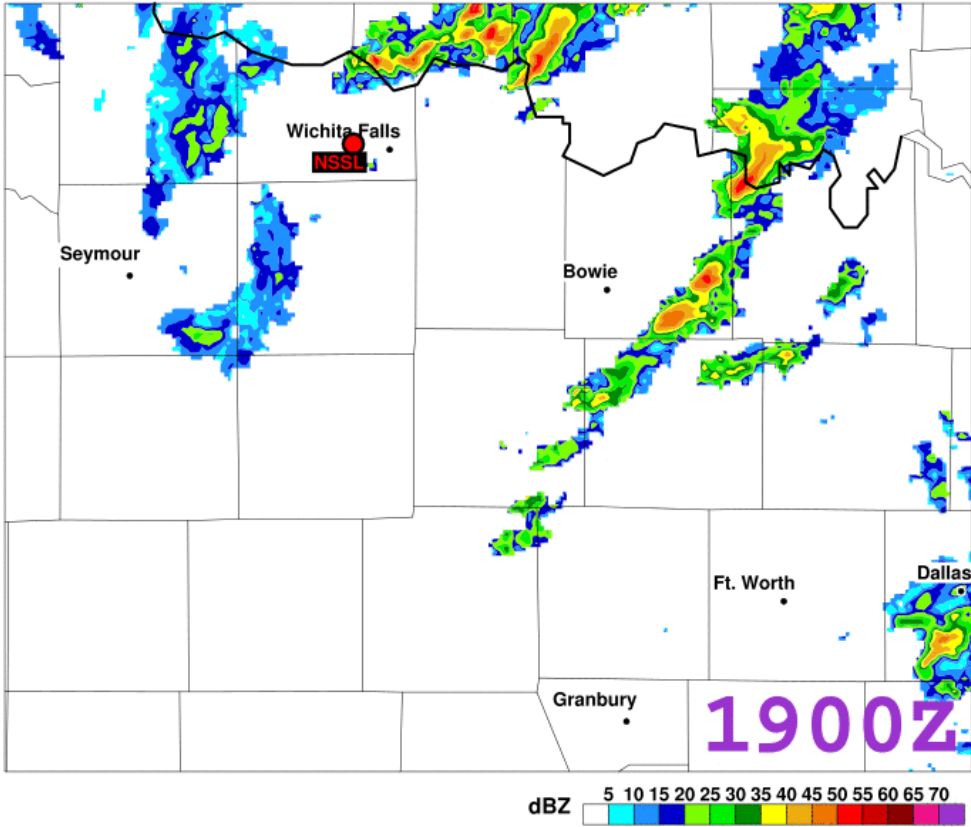


24-h tornado probabilities

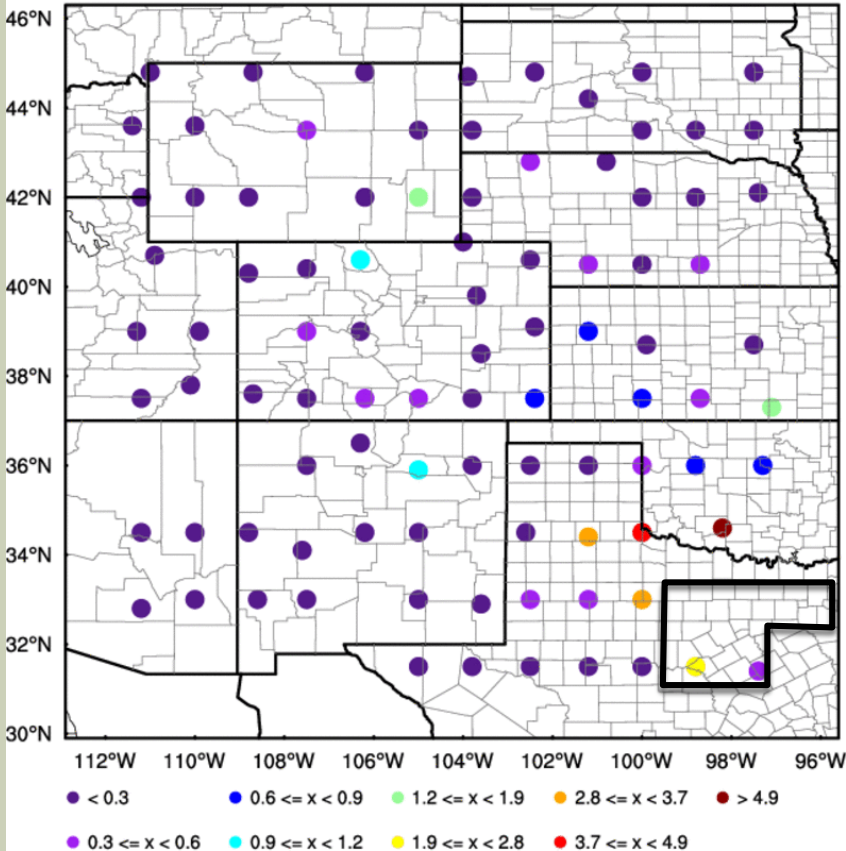


MAY 15TH TORNADIC SUPERCELLS

NSSL NMQ hybrid scan reflectivity valid 1900Z 15 May 2013

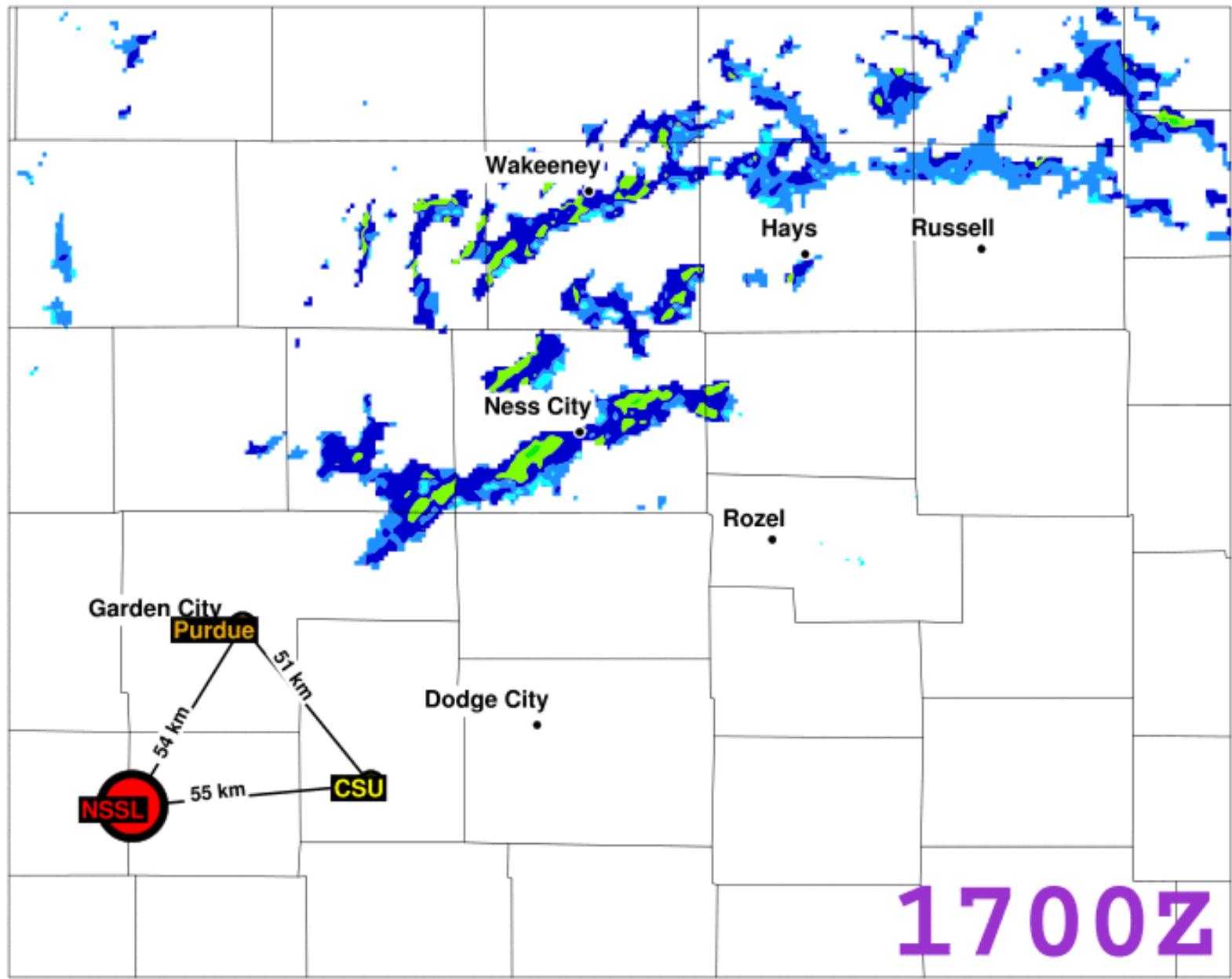


Drosonde impact at 2013051521 (F009)

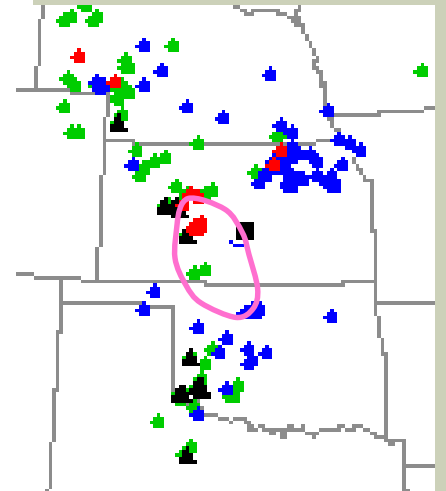
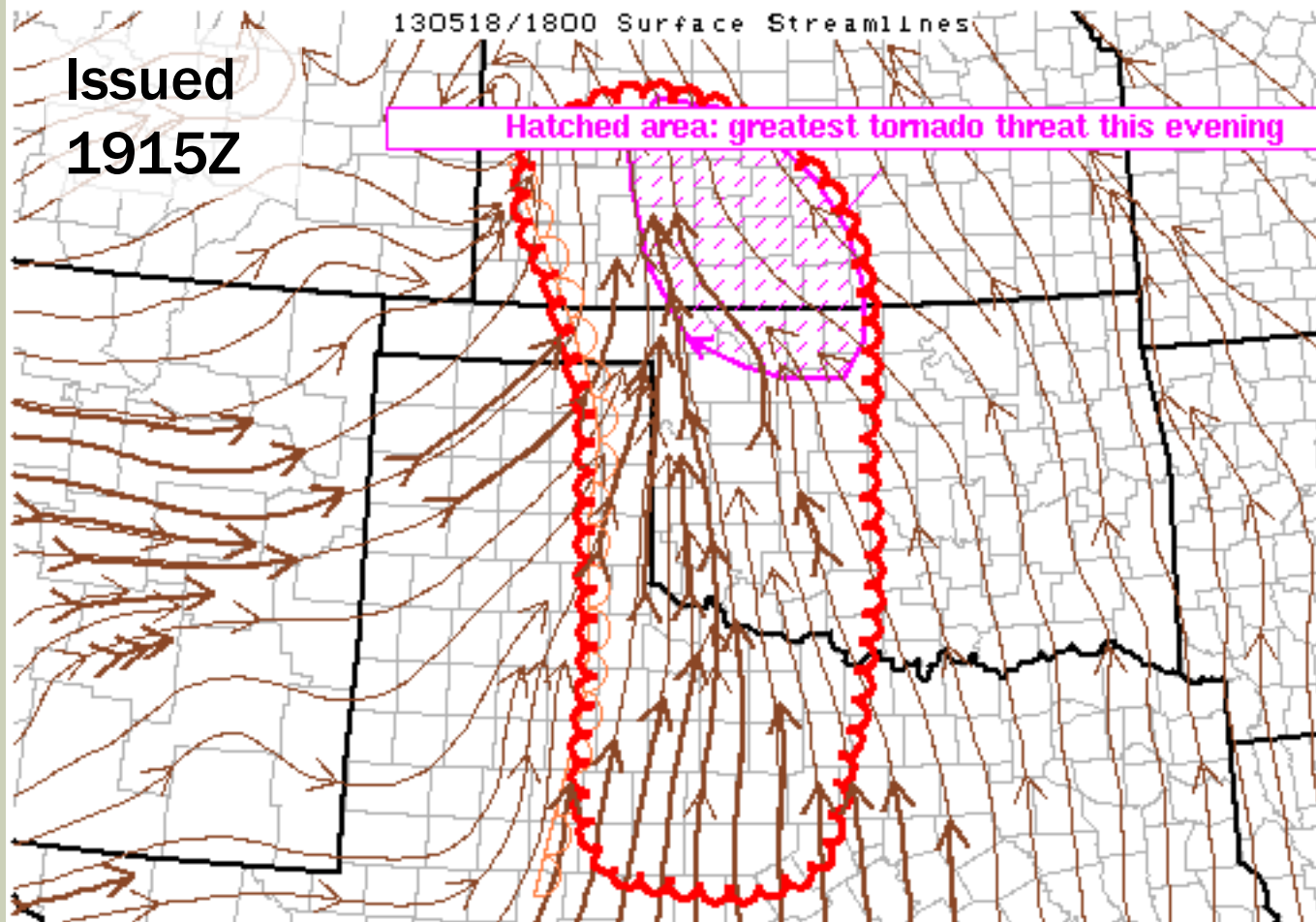


MAY 18TH TORNADIC SUPERCELLS/MCS

NSSL NMQ hybrid scan reflectivity valid 1700Z 18 May 2013



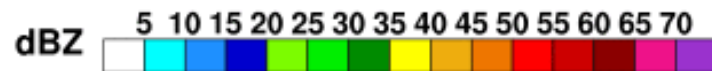
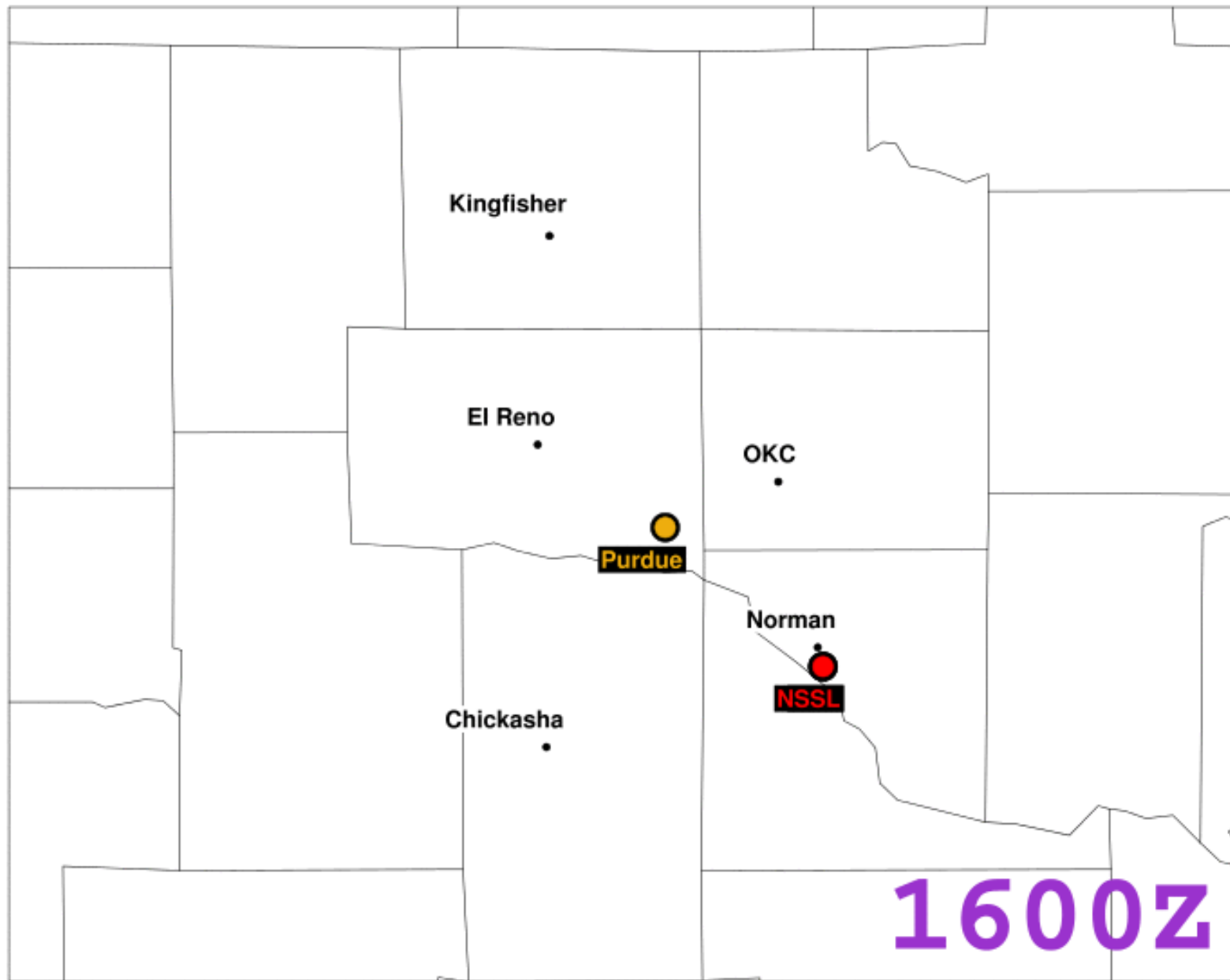
MAY 18TH TORNADIC SUPERCELLS



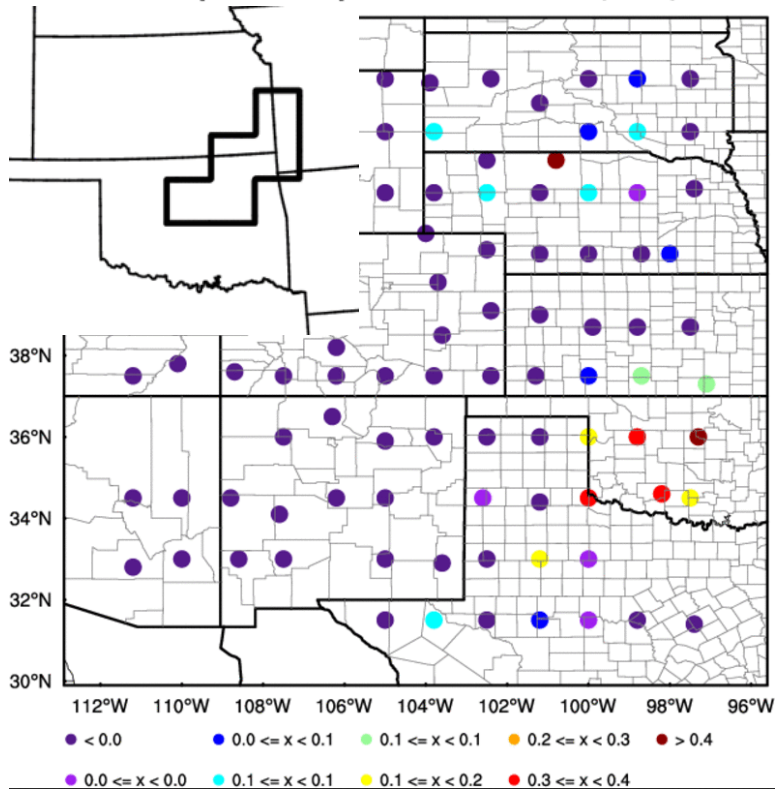
SPC MCD #0676

MAY 31ST TORNADIC SUPERCELLS/MCS

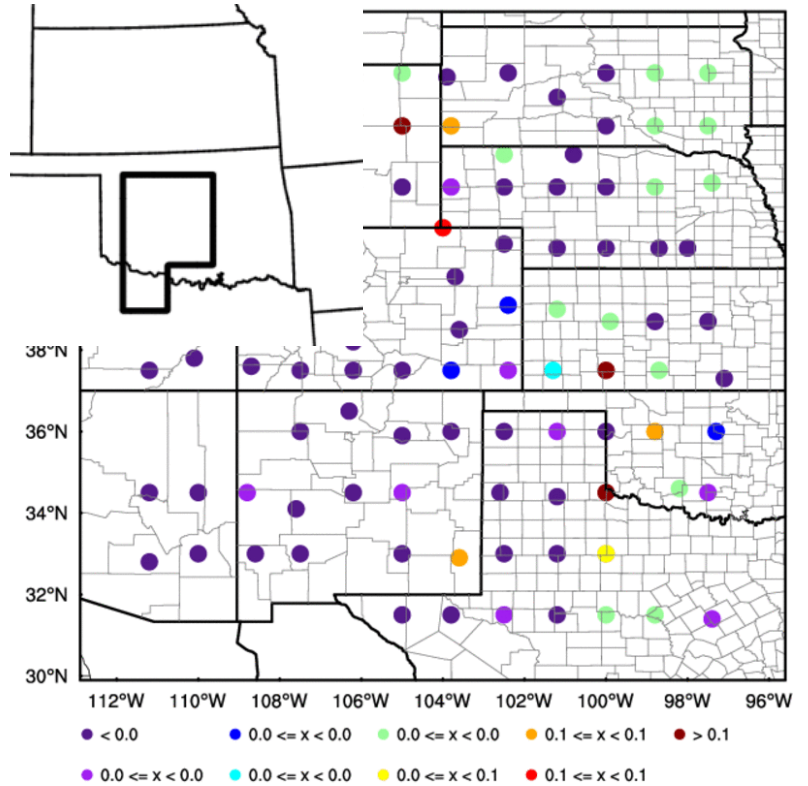
NSSL NMQ hybrid scan reflectivity valid 1600Z 31 May 2013



Dropsonde impact at 2013053118 (F006)



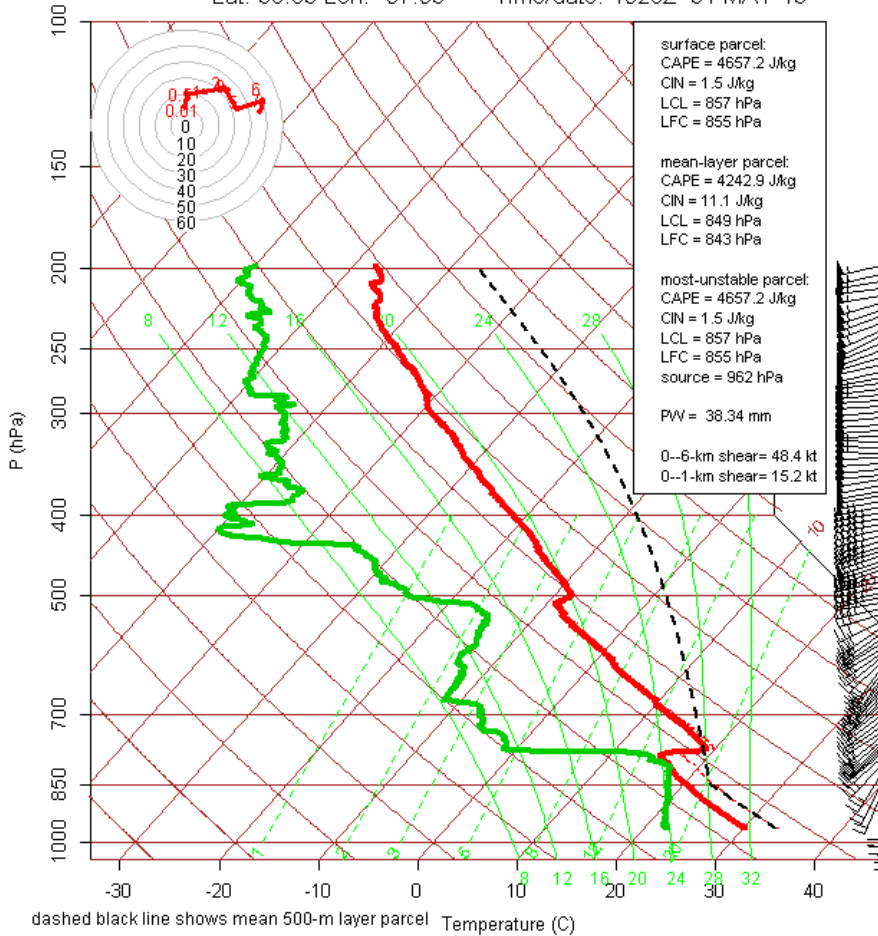
Dropsonde impact at 2013053118 (F006)



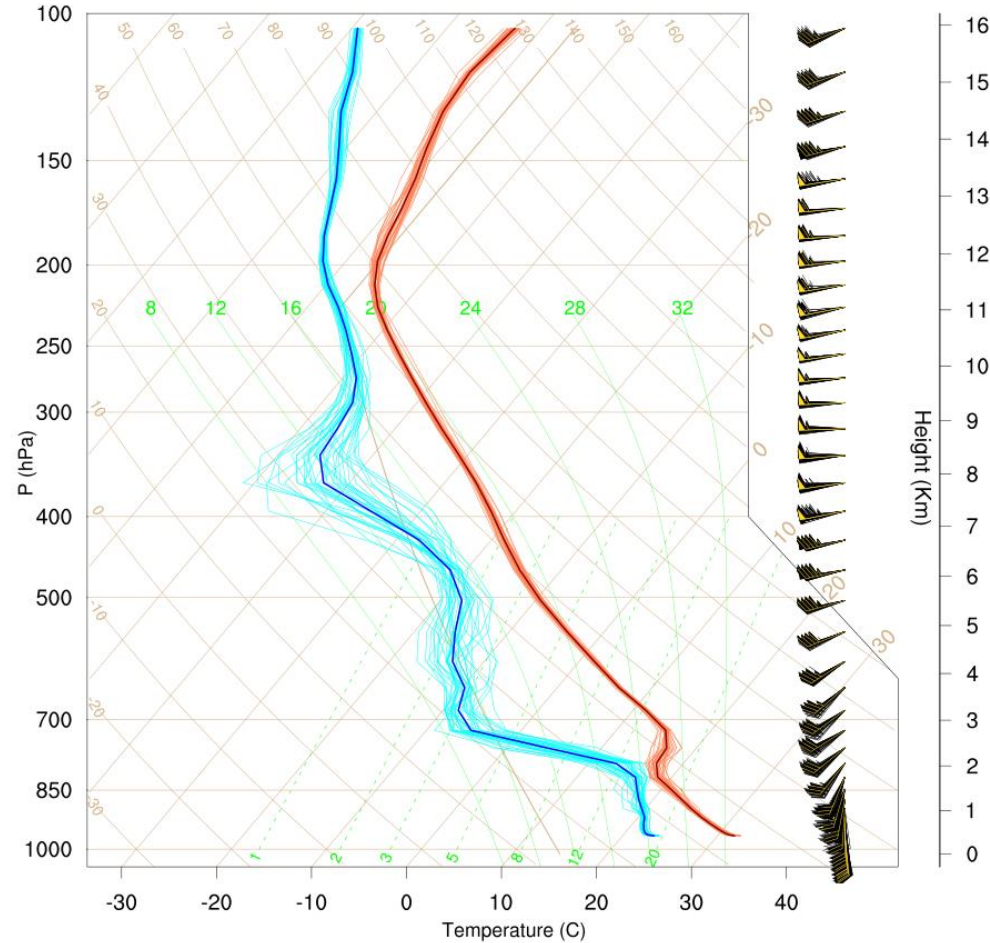
MAY 31ST TORNADIC SUPERCELLS/MCS

CSU sonde for MPEX

Lat: 35.03 Lon: -97.93 Time/date: 1920Z 31 MAY 13

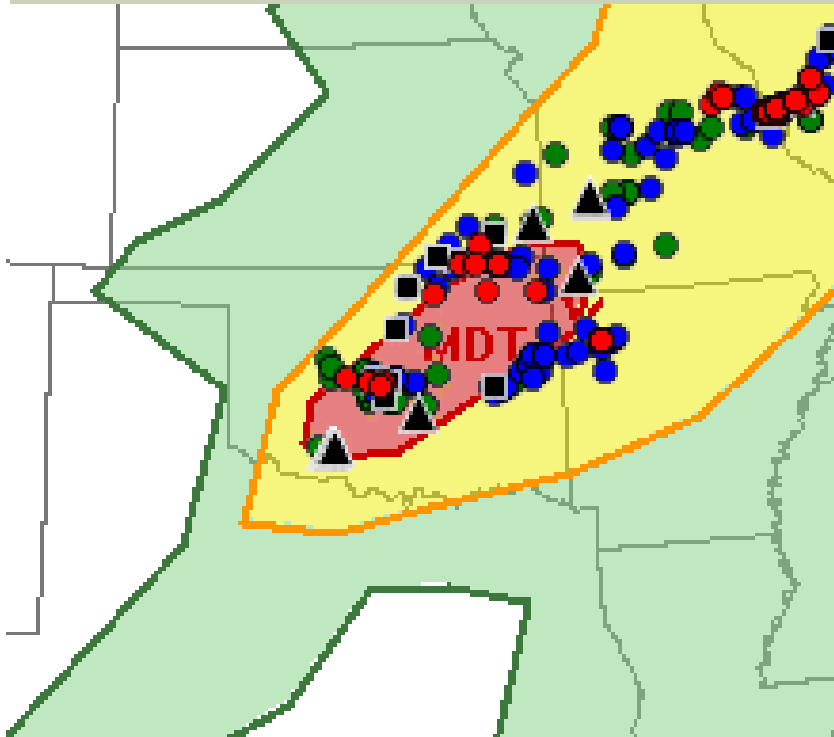


POSTERIOR CTRL valid 130531 1930 35.03 -97.93

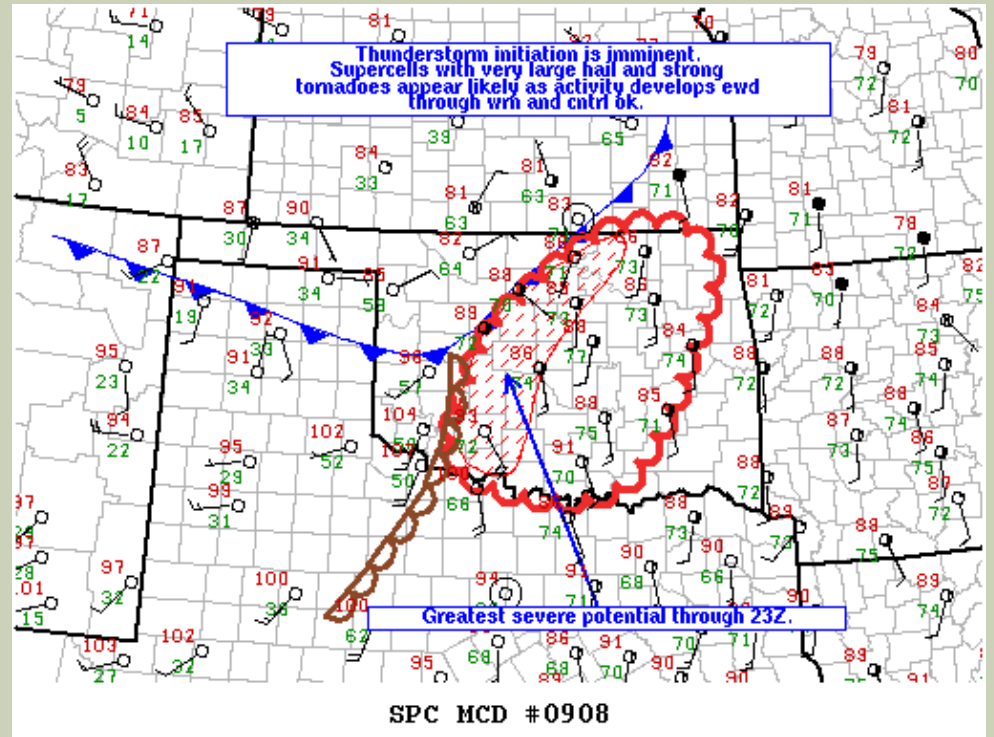


MAY 31ST TORNADIC SUPERCELLS/MCS

Issued 0600Z



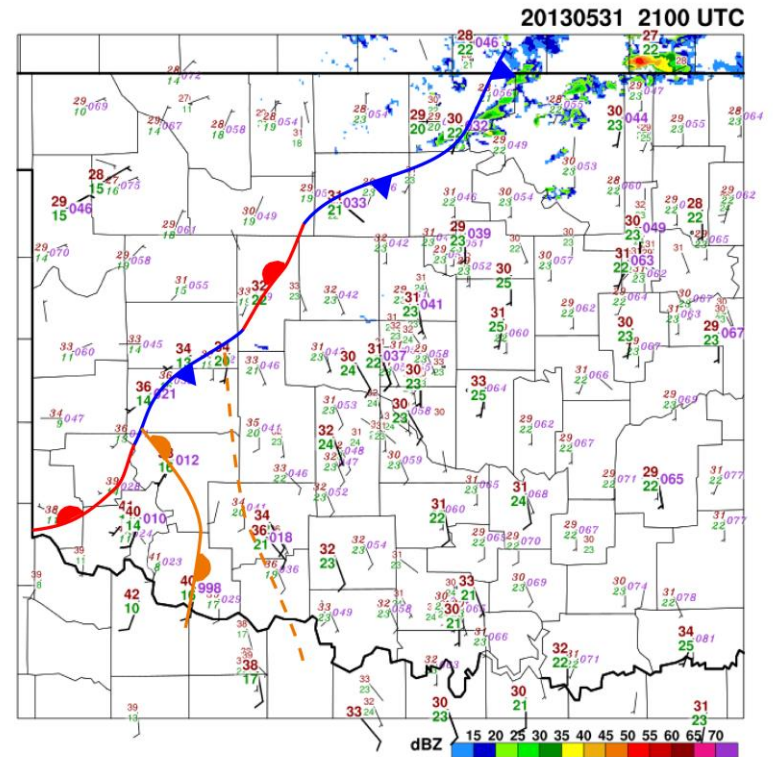
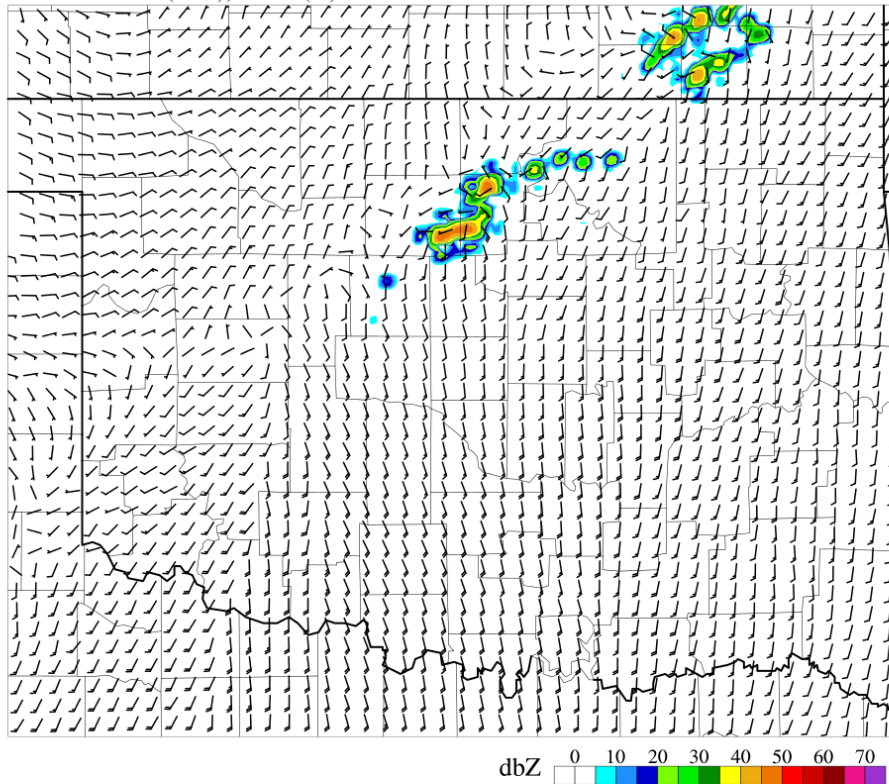
Issued 2155Z



MAY 31ST TORNADIC SUPERCELLS/MCS

1-h forecast

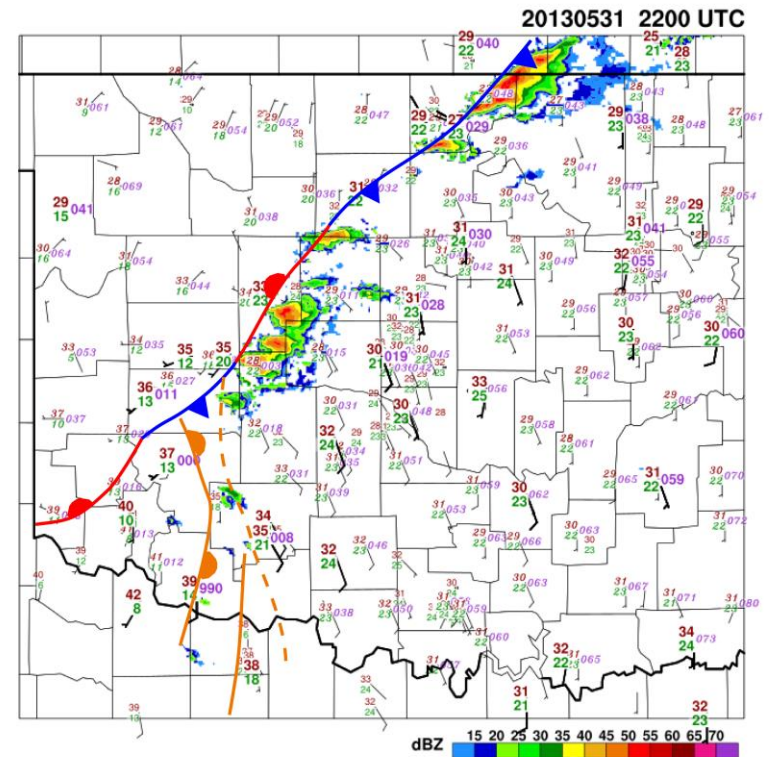
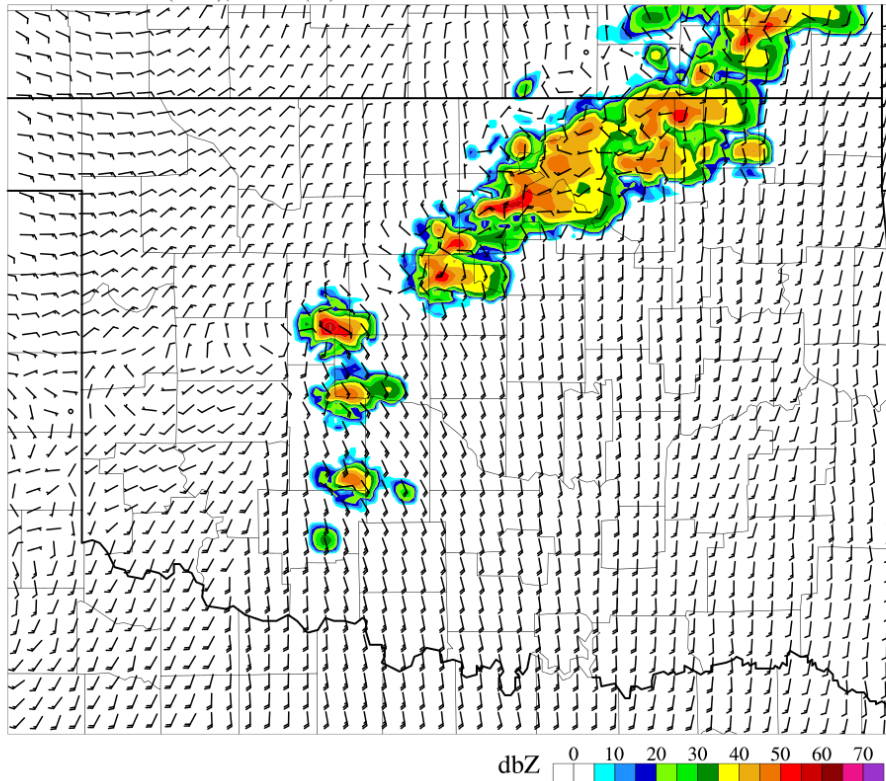
CTRL 1km refl (dBZ), winds (kt) at 10 m F60min valid 2100 UTC 20130531



MAY 31ST TORNADIC SUPERCELLS/MCS

2-h forecast

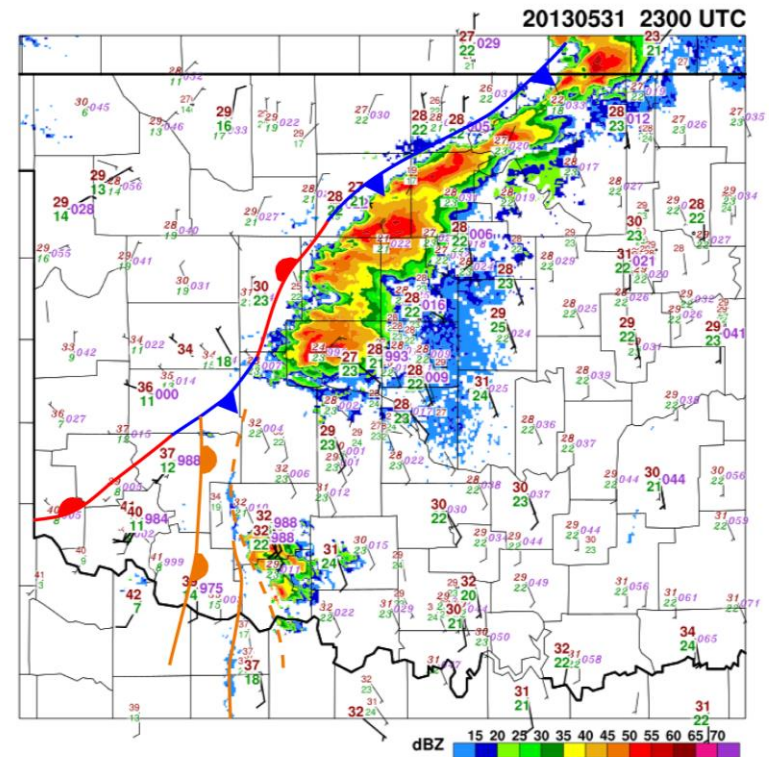
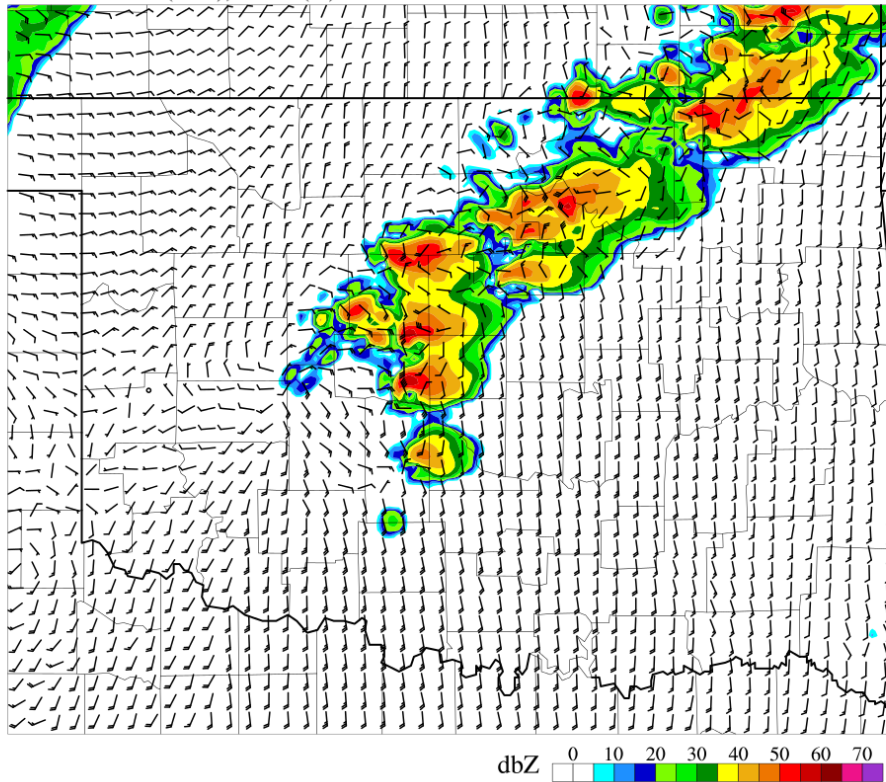
CTRL 1km refl (dBZ), winds (kt) at 10 m F120min valid 2200 UTC 20130531



MAY 31ST TORNADIC SUPERCELLS/MCS

3-h forecast

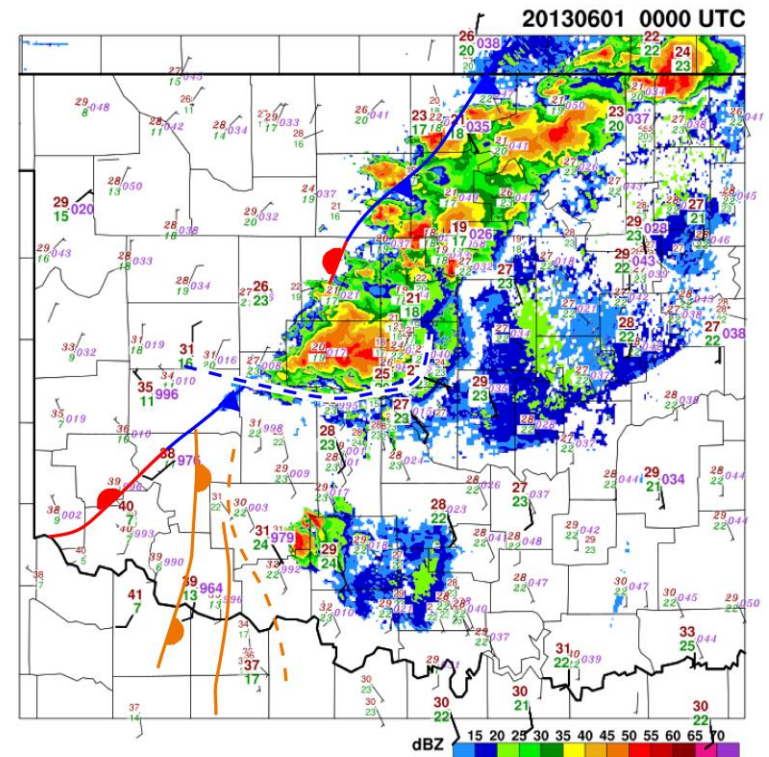
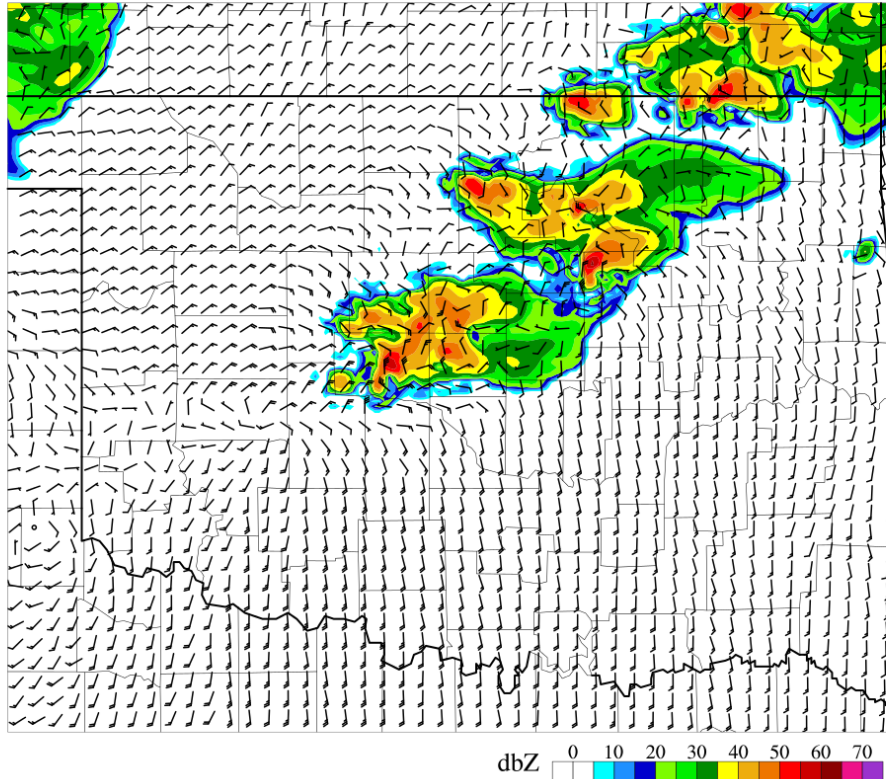
CTRL 1km refl (dBZ), winds (kt) at 10 m F180min valid 2300 UTC 20130531



MAY 31ST TORNADIC SUPERCELLS/MCS

4-h forecast

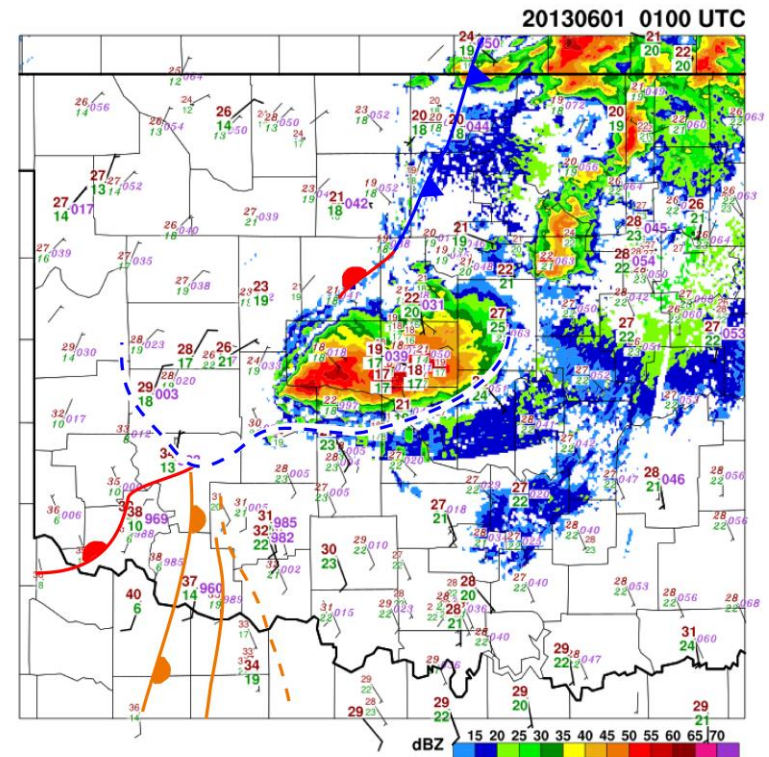
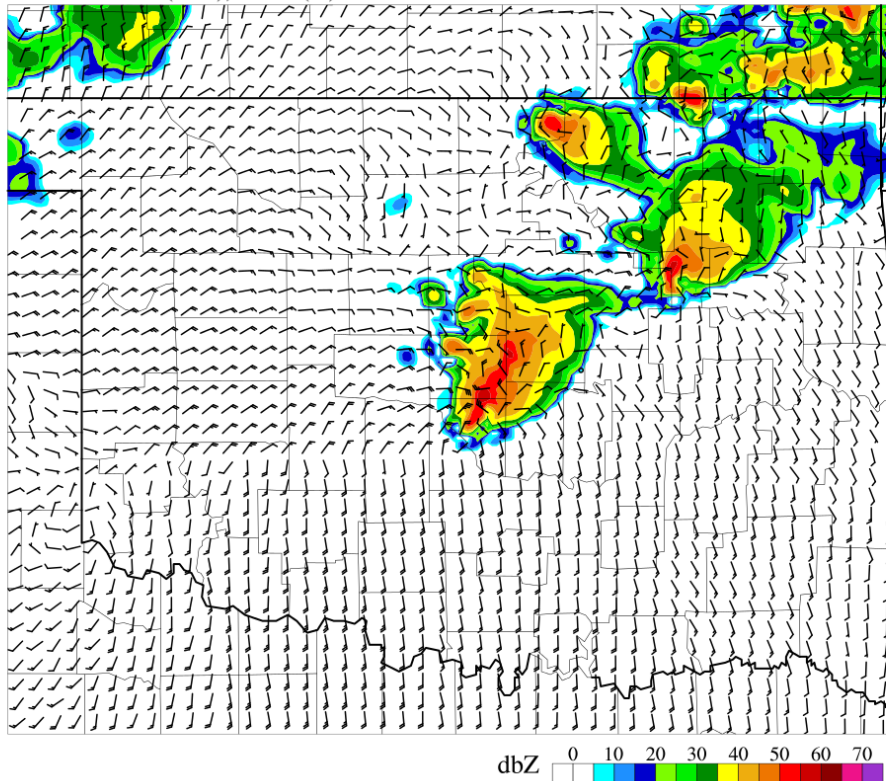
CTRL 1km refl (dBZ), winds (kt) at 10 m F240min valid 0000 UTC 20130601



MAY 31ST TORNADIC SUPERCELLS/MCS

5-h forecast

CTRL 1km refl (dBZ), winds (kt) at 10 m F300min valid 0100 UTC 20130601



MAY 31ST TORNADIC SUPERCELLS/MCS

6-h forecast

CTRL 1km refl (dBZ), winds (kt) at 10 m F360min valid 0200 UTC 20130601

