

TC TORNADOES and SPC FORECASTS in TC SITUATIONS

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***Storm
Prediction
Center***

Norman, Oklahoma

***METR 4403/5403: Applications of Meteorological
Theory to Severe-Thunderstorm Forecasting***

TC HERMINE TORNADOES HIT DALLAS

Tornadoes touch down in Dallas

By **the CNN Wire Staff**

September 9, 2010 -- Updated 0046 GMT (0846 HKT)

INFO MOR
KUP



TC MUJIGAE TORNADOES HIT CHINA

Seven dead and 223 injured as tornadoes brought by Typhoon Mujigae ravage China's Guangdong province

Mimi Lau
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UPDATED : Tuesday, 06 October, 2014



One of the tornadoes that struck Guangdong province on Sunday. Photo: SCMP Pictures

At least seven people were killed and 16 were reported missing in Guangdong on Sunday after Typhoon Mujigae and the tornadoes it generated ravaged the province, cutting power, water supplies and communications.

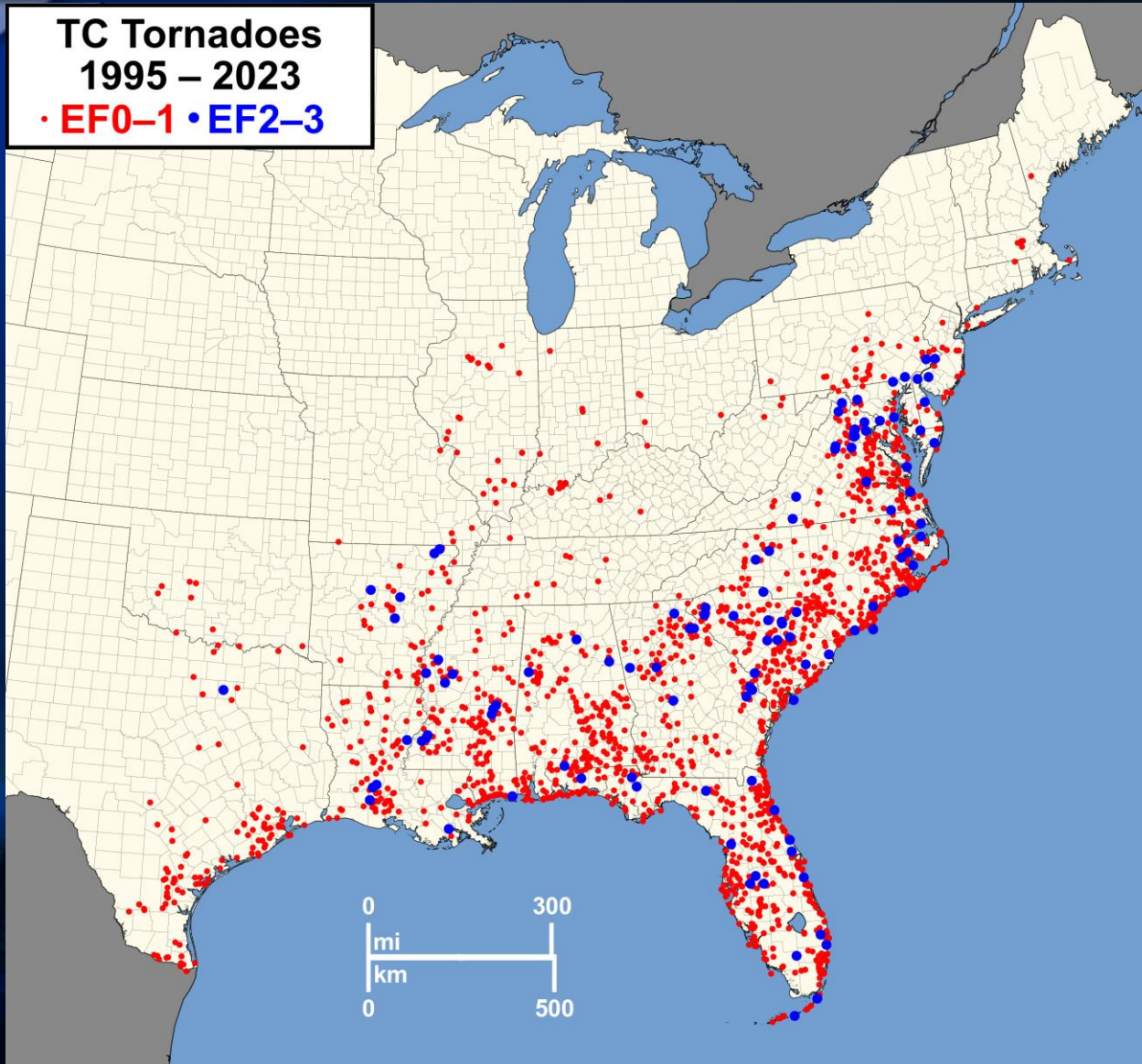
**Six killed by 2 tornadoes (3 each).
One killed on boat in typhoon itself.
Image courtesy South China Morning Post.**



TC TORNADO FACTS & CLIMATOLOGY

- **MOST COMMON IN <50-kt WIND AREA**
- **MOST COMMON NNW-NE-SE OF CENTER**
- **MOST COMMON AND DAMAGING FROM MINI-SUPERCELLS (EF0-EF3, TWO F4S SINCE 1950)**
- **OCCASIONALLY REPORTED FROM NON-SUPERCELL RADAR FEATURES (WEAK – EF0-EF1)**
- **SHARP DECREASE >500 km FROM COASTS**
- **MORE COMMON DIURNALLY**
- **OCCUR OVER WATER AND CAN MOVE ASHORE**
- **OCCUR IN EVERY STAGE OF CLASSIFICATION**
- **DETAILED DISCUSSION IN EDWARDS (2012), EJSSM**

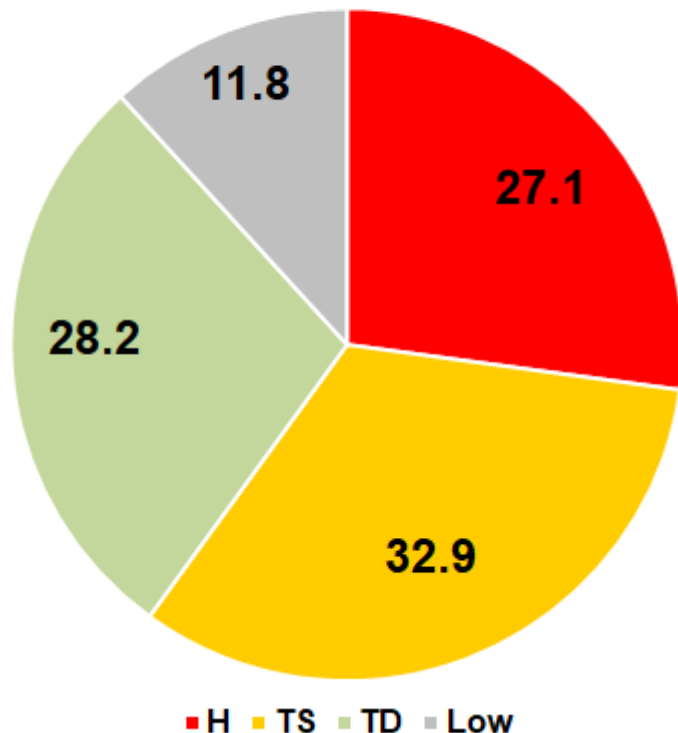
TC TORNADO FACTS & CLIMATOLOGY



Geography of
TCTOR events

TC TORNADO FACTS & CLIMATOLOGY

TC Tornadoes by
Classification at Tornado
Time: 1995–2023 Percent

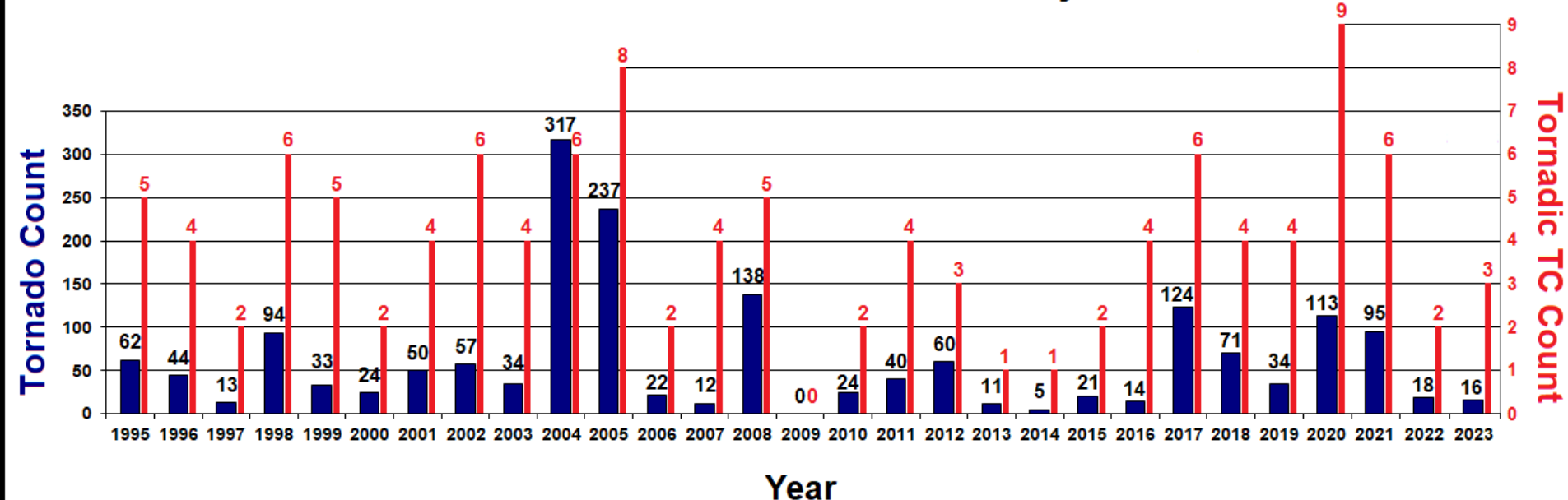


TCTOR DATA: TC STRENGTH AT TORNADO TIME (from HURDAT)

<u>TC Category</u>	<u>Max Sus. Wind (mph)</u>
MH 5	>155
MH 4	131-155
MH 3	111-130
MH 2	96-110
MH 1	74-95
TS 0	39-73
TD -1	<38
N -2	Not classified

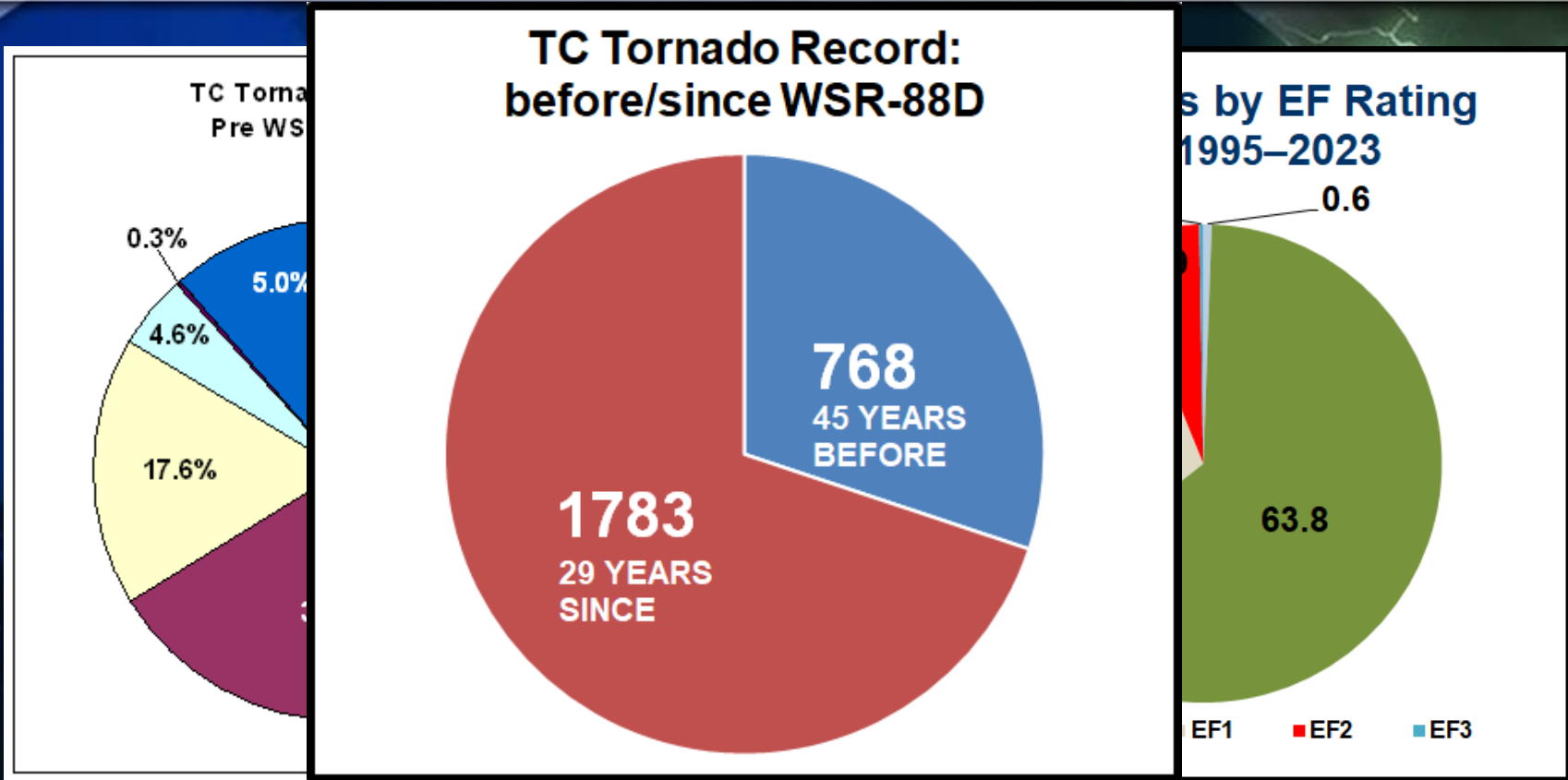
TC TORNADO FACTS & CLIMATOLOGY

TC Tornadoes and Tornadoic TCs by Year



Highly variable year-to-year in WSR-88D era

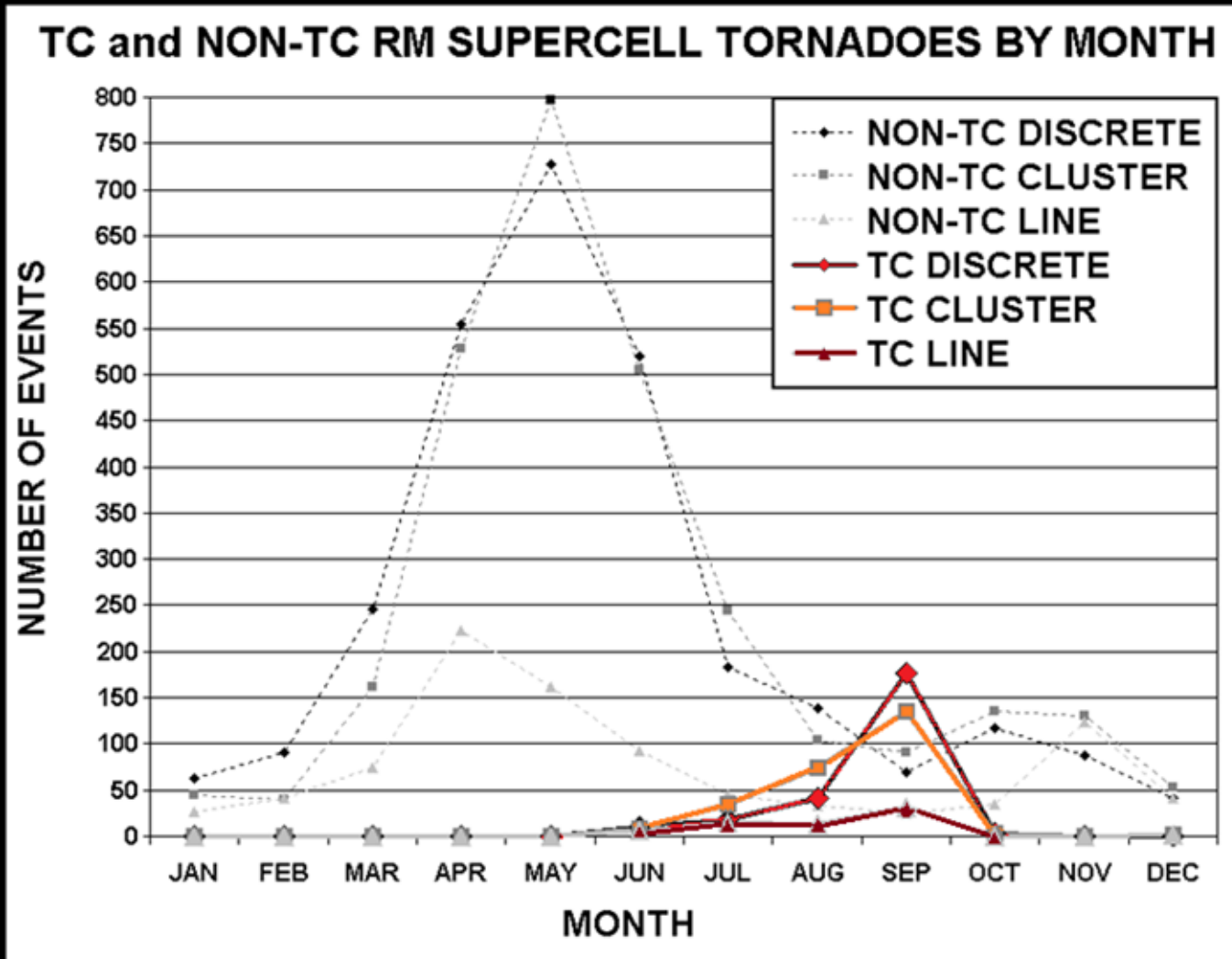
TC TORNADO FACTS & CLIMATOLOGY



88D era: Many more weak TC tornado reports, Many more TC tornado reports PERIOD!

Pre-TCTOR data from Schultz and Cecil (2009)

TC TORNADO FACTS & CLIMATOLOGY



data from Edwards et al. (2012)

TC TORNADO FACTS & CLIMATOLOGY

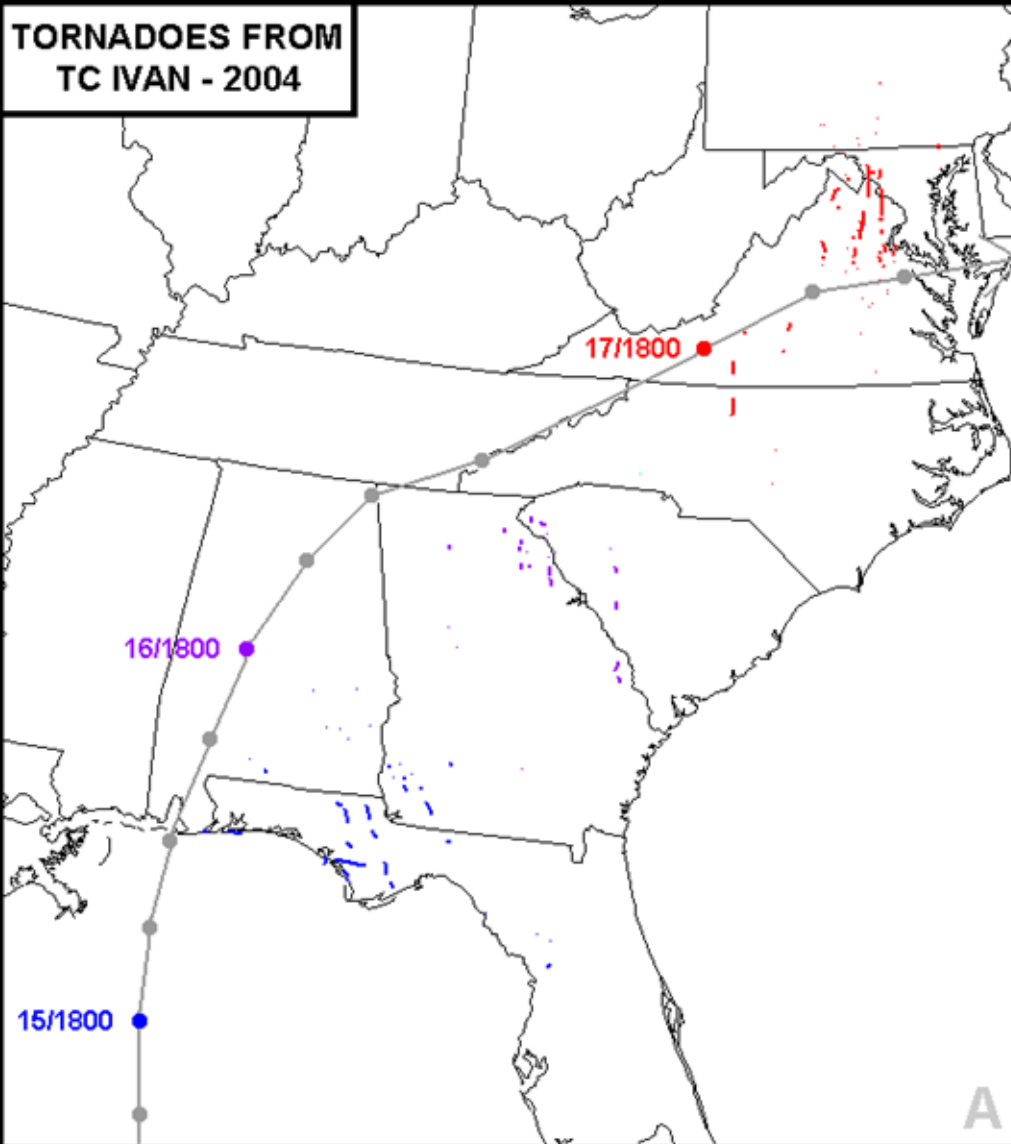
...and the single-storm winner is

IVAN



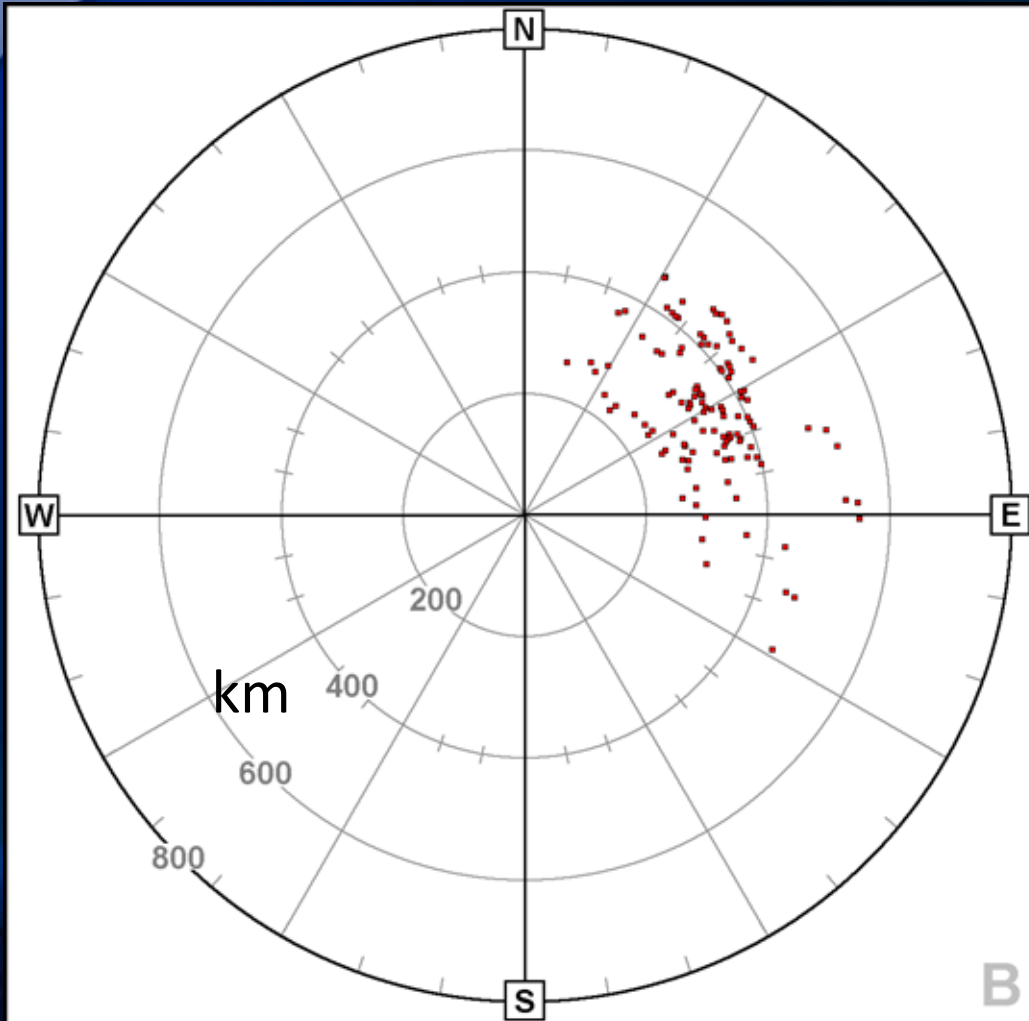
**118 in 3-DAY CYCLE
MAY HAVE SET ALL-
TIME RECORD
(115 – BEULAH 1967)**

TORNADOES FROM
TC IVAN - 2004



A

TC TORNADO FACTS & CLIMATOLOGY



3 DAYS COMBINED
TOTAL TORNADO
DISTRUBITION FROM
CENTER FOR IVAN
(2004)
VERY TIGHT!



TC TORNADO FACTS & CLIMATOLOGY

TROPICAL CYCLONE	YEAR	TORNADO REPORTS
H Ivan	2004	118
H Beulah	1967	115
H Frances	2004	103
H Rita	2005	97
H Katrina	2005	59
H Andrew	1992	56
H Harvey	2017	52
TS Fay	2008	50
H Gustav	2008	49
H Georges, H Cindy	1998, 2005	48

TOP-10 LIST

From TCTOR and pre-1995 formal references

Peak classification

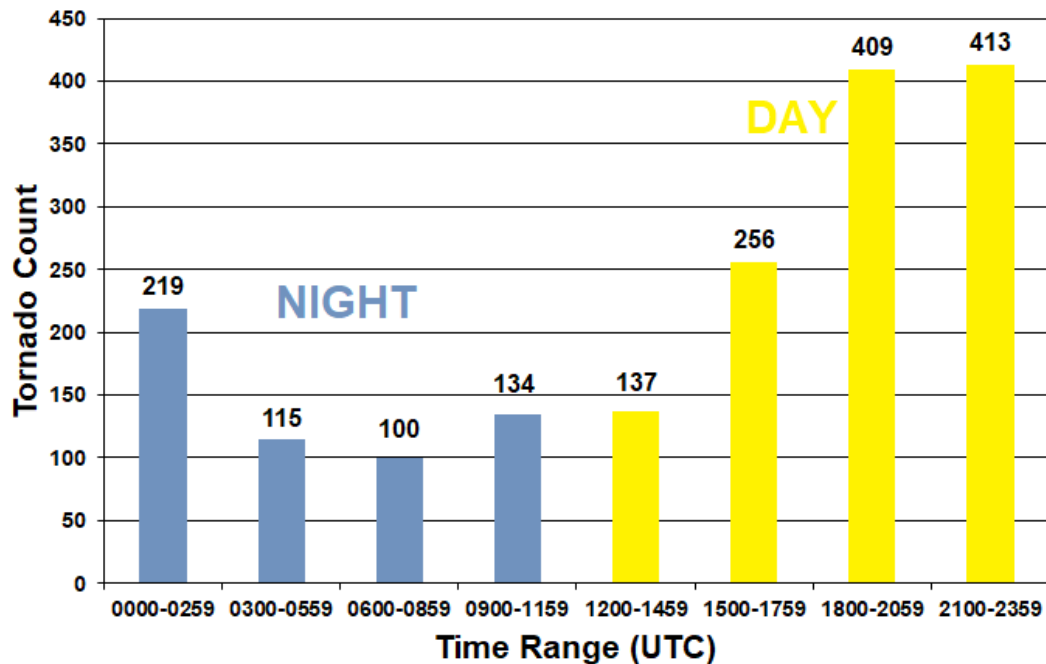
CLIMATOLOGICAL APPLICATION TO FORECASTING CONCEPTS

DIURNAL TREND:

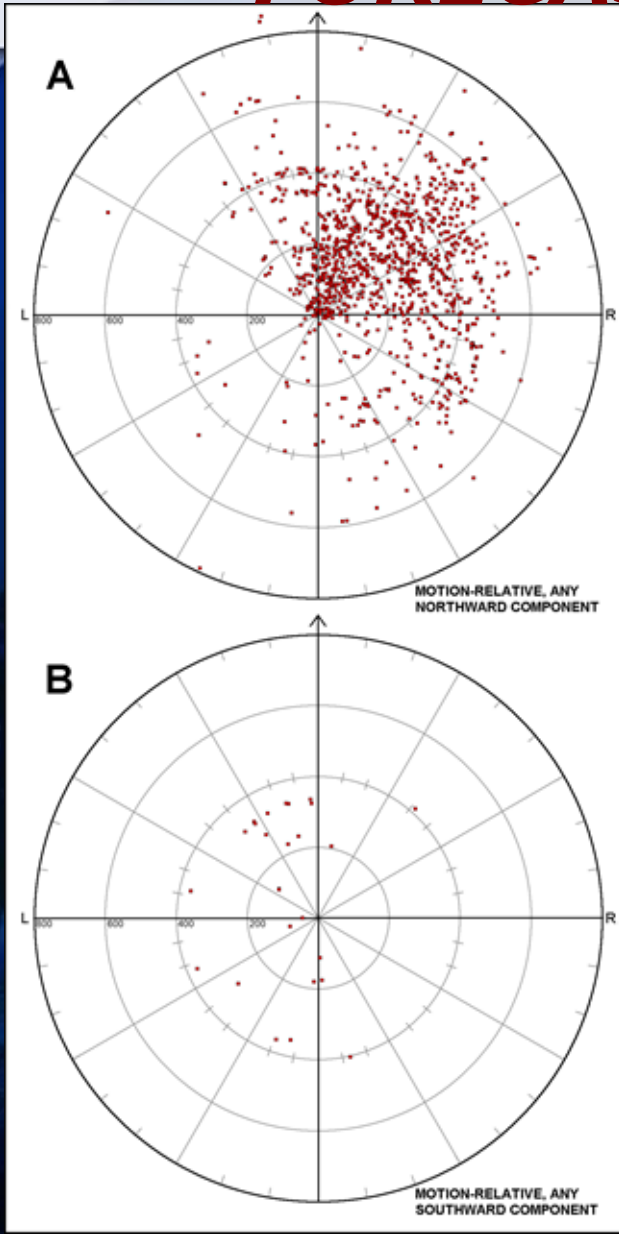
In moist-adiabatic lapse rate environment, even subtle thermal warming under cloud cover greatly increases CAPE.

Dry air intrusions into TCs allow for gaps between convective rainbands

TC Tornadoes
1995–2023 by UTC Time Bin



CLIMATOLOGICAL APPLICATION TO FORECASTING CONCEPTS

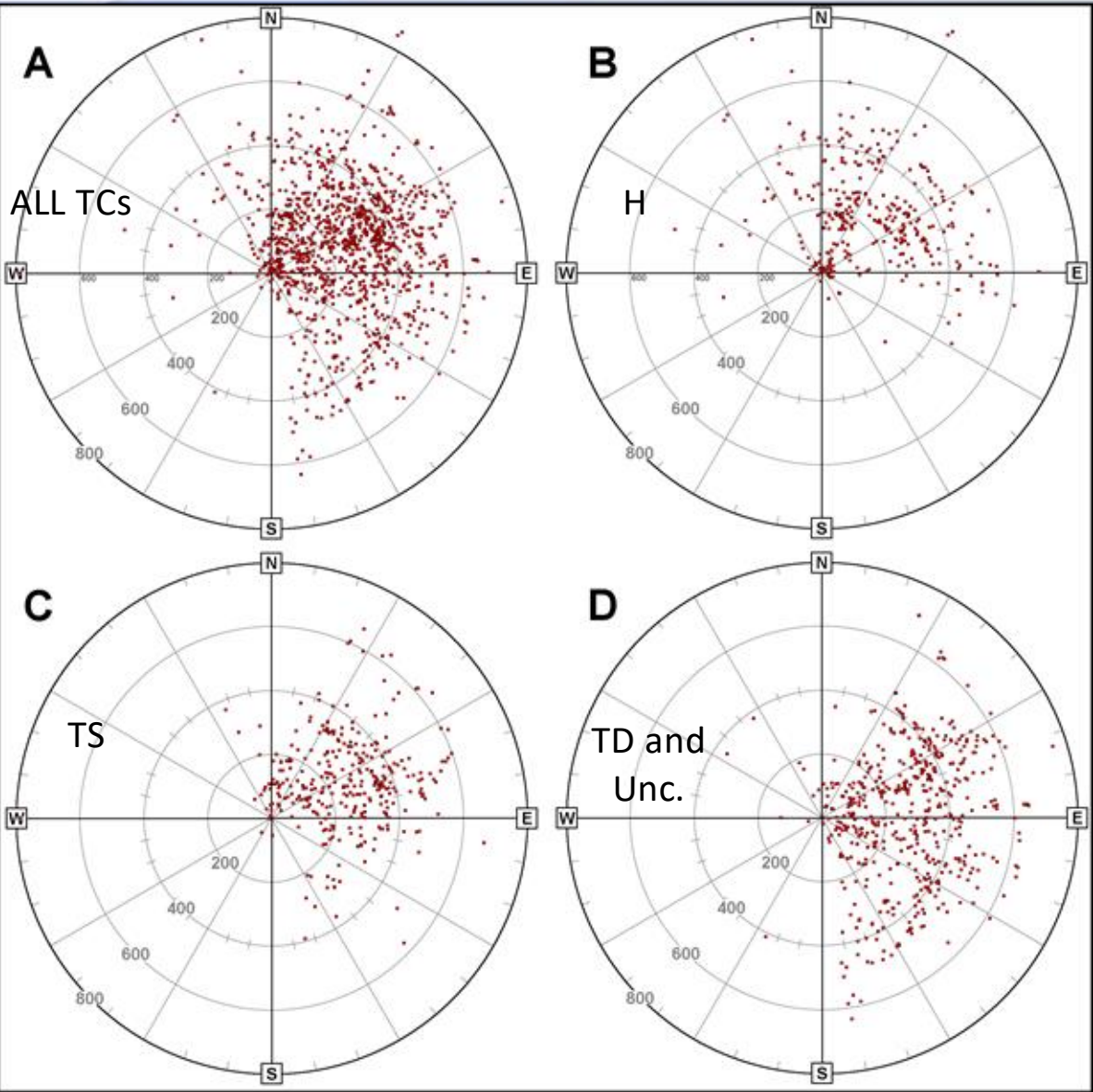


Motion-relative AZRAN of TCTOR events from center: **Northward translation component**

HOW MOTION-RELATIVE FAILS

Motion-relative AZRAN of TCTOR events from center: **Southward translation component**

CLIMATOLOGICAL APPLICATION TO FORECASTING CONCEPTS

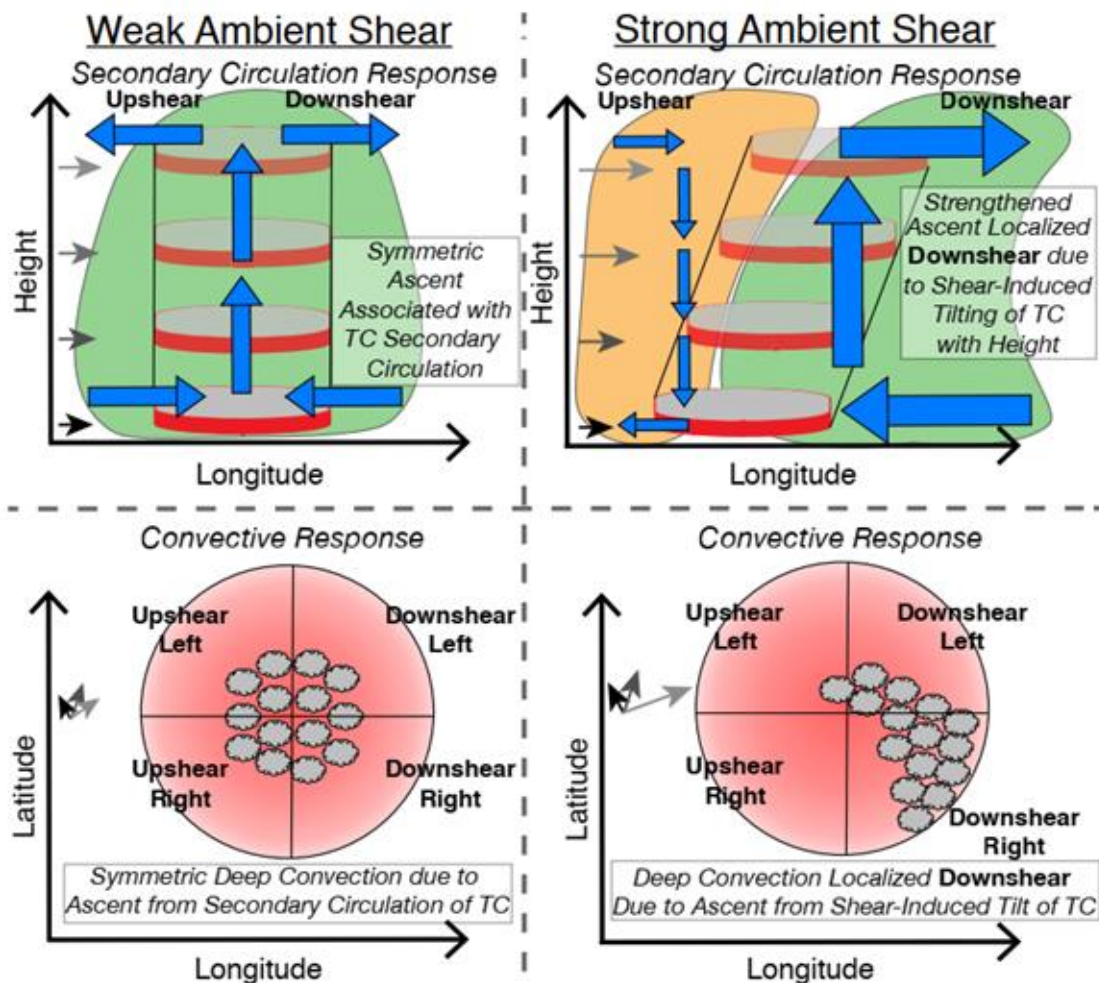


Tornadoes more common in SE sectors as TCs weaken...WHY?

...partly due to that sector's being over water when most are mature hurricanes!

CLIMATOLOGICAL APPLICATION TO FORECASTING CONCEPTS

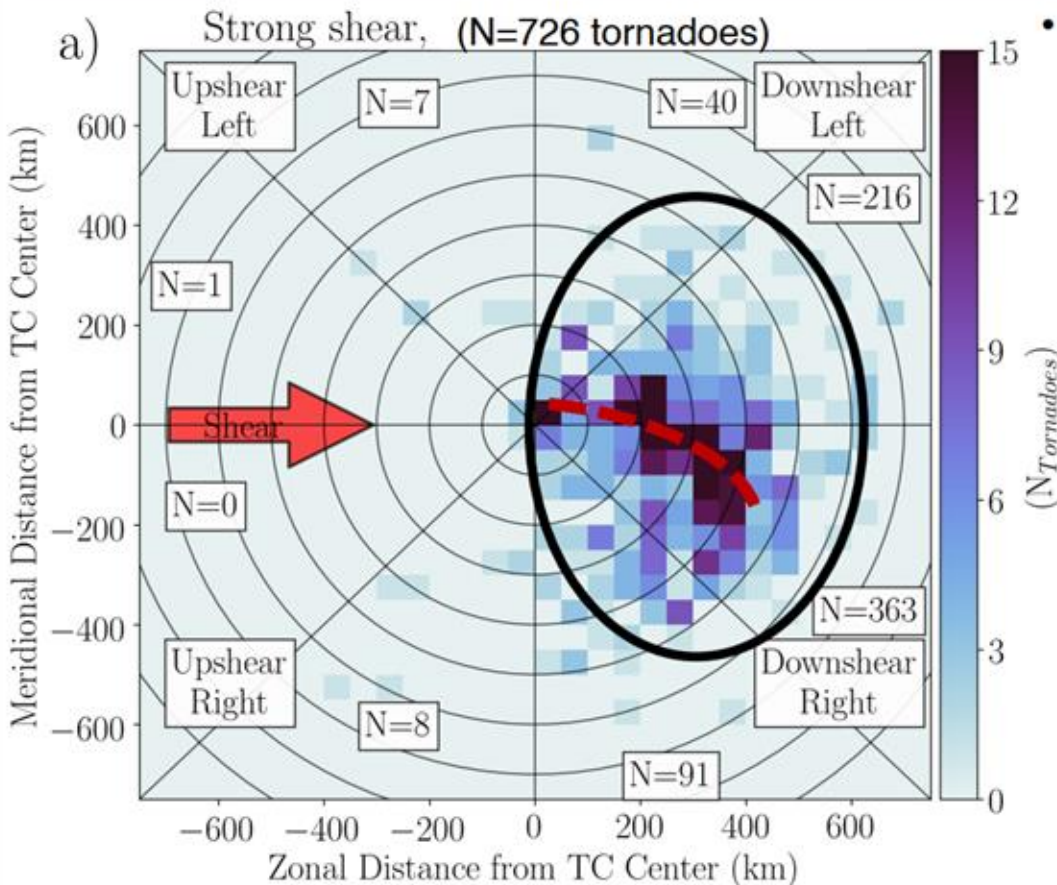
Shear-vector-relative distributions with physical basis
(Schenkel et al. 2020 – October 2020 WaF)



CLIMATOLOGICAL APPLICATION TO FORECASTING CONCEPTS

Shear-vector-relative distributions with physical basis (Schenkel et al. 2020 – October 2020 WaF)

Tornado Frequency and Location in Strongly Sheared TCs



- Strongly sheared TCs associated with:
 1. Majority of tornadoes (57%);
 2. Nearly all tornadoes in **downshear half** of TC.

TC TORNADO FORECASTING CONCEPTS

Shifting from climatology-based and empirical to

INGREDIENTS-BASED THINKING

For supercells in midlatitude systems and tropical cyclones!

- ◆ **MOISTURE:** usually no problem
- ◆ **INSTABILITY:** helps to have diurnal heating with large antecedent BL theta-e to offset weak lapse rates aloft
- ◆ **(source for) LIFT:** Spiral bands, embedded boundaries concentrate threat on mesoscale and smaller – **FREQUENT HAND ANALYSIS is CRUCIAL!**
- ◆ **VERTICAL SHEAR:** Peak hodographs in climatologically favored N-NE-SSE sector, which is **DOWNSHEAR**

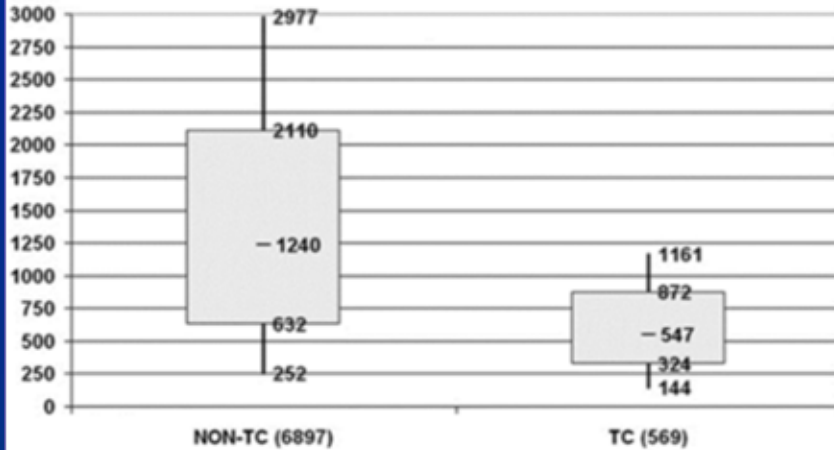
TC TORNADO FORECASTING CONCEPTS

Objectively analyzed parameters (e.g. SPC SFCOA)

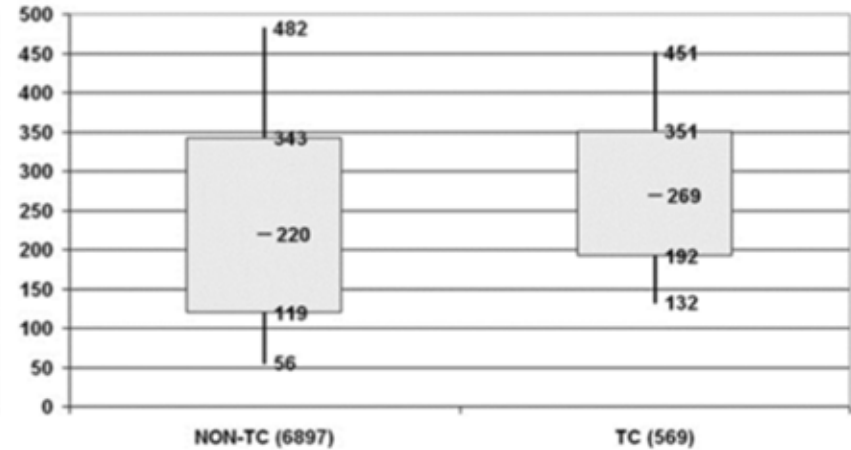
- ◆ **TESTED FOR 2003-2011 TC TORNADO ENVIRONMENTS**
- ◆ **LITTLE DIFFERENCE WITH ANY PARAMETER between WEAK & STRONG TC TORNADOES**
- ◆ **HIGH PW, WEAK LAPSE RATES, LOWER MLCAPE WITH TC vs. MIDLATITUDE TORNADOES**
- ◆ **LOWER/MORE COMPRESSED SCP AND STP DISTRIBUTIONS FOR TC TORNADOES**
- ◆ **RUC-BASED: WAS UNRELIABLE/INACCURATE WITH WIND AND PRESSURE TOWARD CENTER OF TS AND HURRICANE. TOO FEW CASES on RAPID REFRESH.**

TC TORNADO FORECASTING CONCEPTS

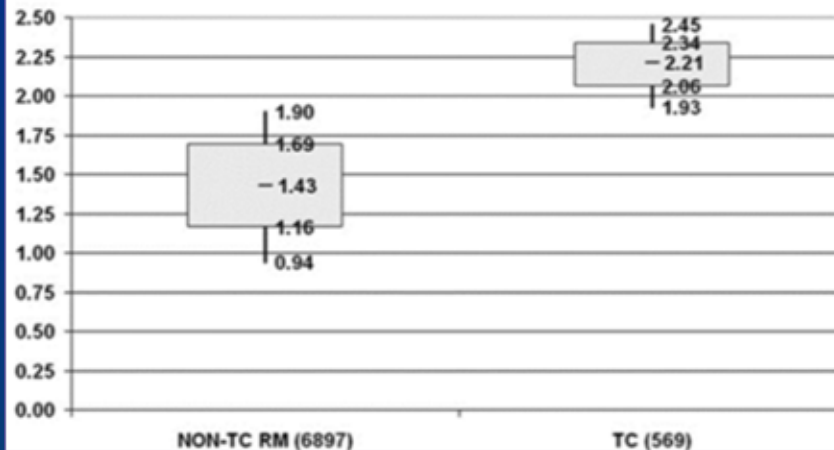
MLCAPE for SUPERCELL TORNADOES:
2003-2011



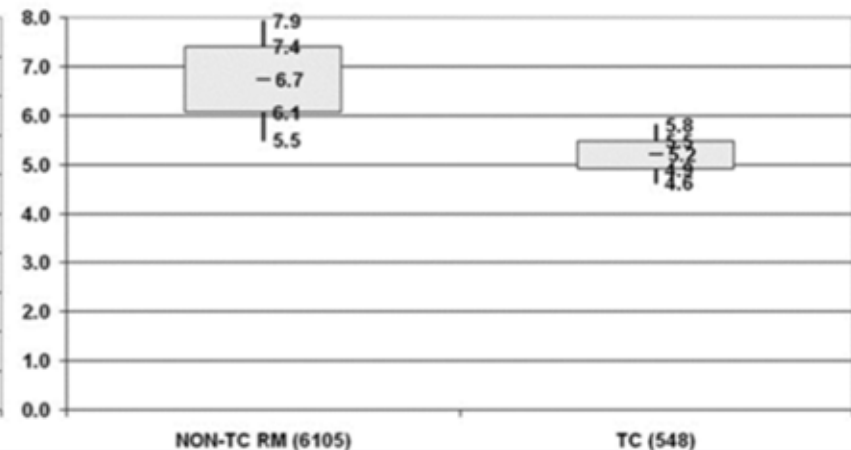
0-1 km SRH for SUPERCELL TORNADOES:
2003-2011



PW for SUPERCELL TORNADOES:
2003-2011



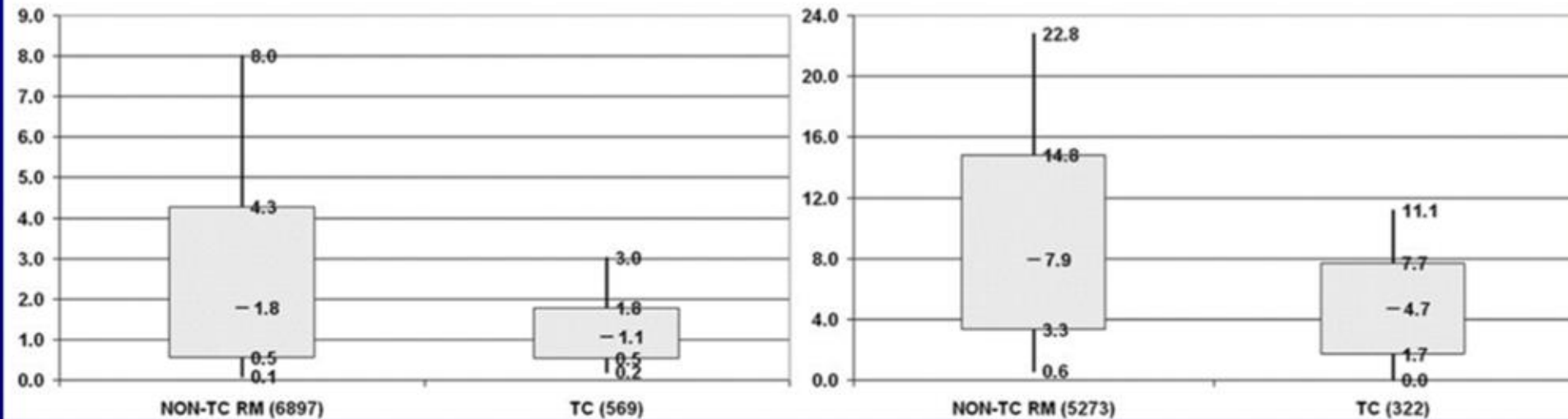
700-500 mb LR for SUPERCELL TORNADOES:
2003-2011



TC TORNADO FORECASTING CONCEPTS

STP for SUPERCELL TORNADOES:
2003-2011

SCP-EFF for SUPERCELL TORNADOES:
2003-2011



TC TORNADO FORECASTING CONCEPTS

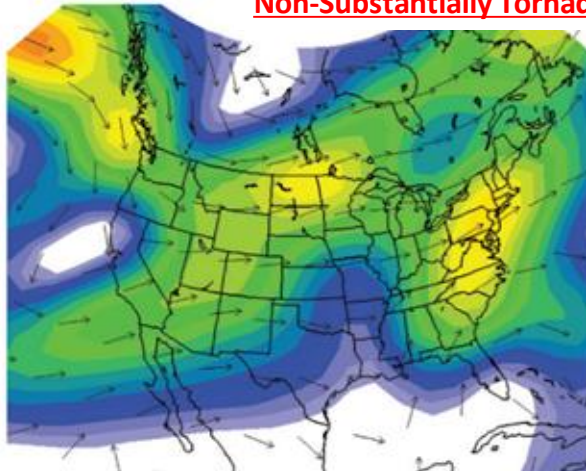


TC TORNADO FORECASTING CONCEPTS – SYNOPTIC PATTERNS

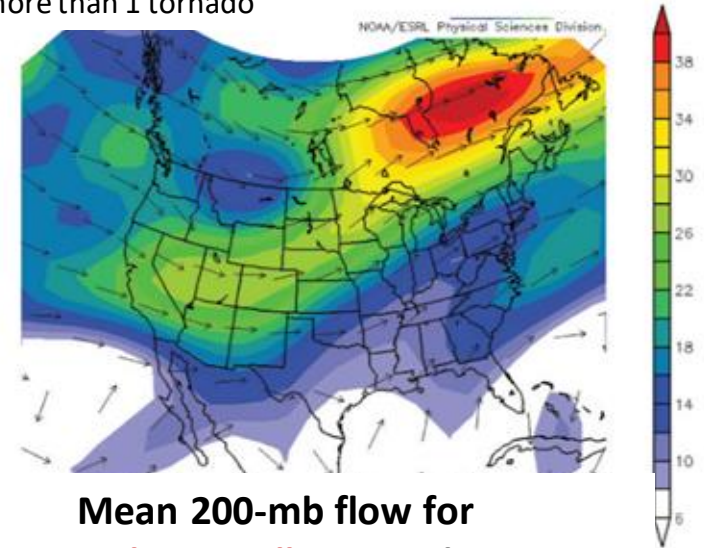
Substantially Tornadoic TCs: Produce at least 4 tornadoes

Non-Substantially Tornadoic TCs: Produce no more than 1 tornado

Fig. 3(c).



Mean 200-mb flow for
Substantially Tornadoic TCs



Mean 200-mb flow for
Non-Substantially Tornadoic TCs

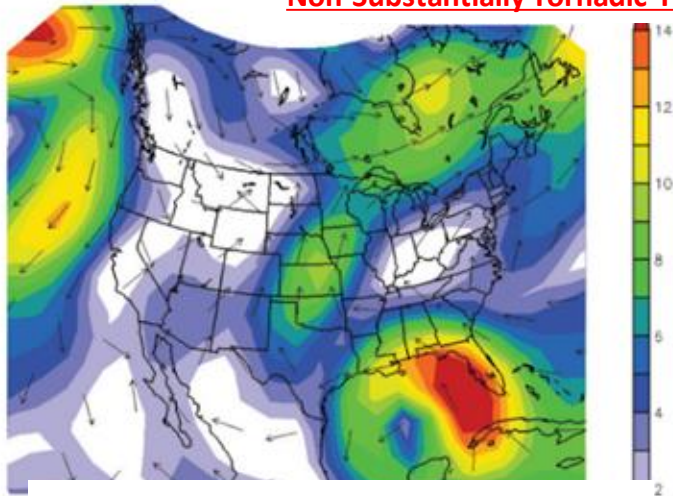
-Right entrance region of enhanced 200-mb jet streak enhances tornado potential over Southeast.

-Any upper-level jet streak associated with non-substantial tornadoic TCs was much weaker.

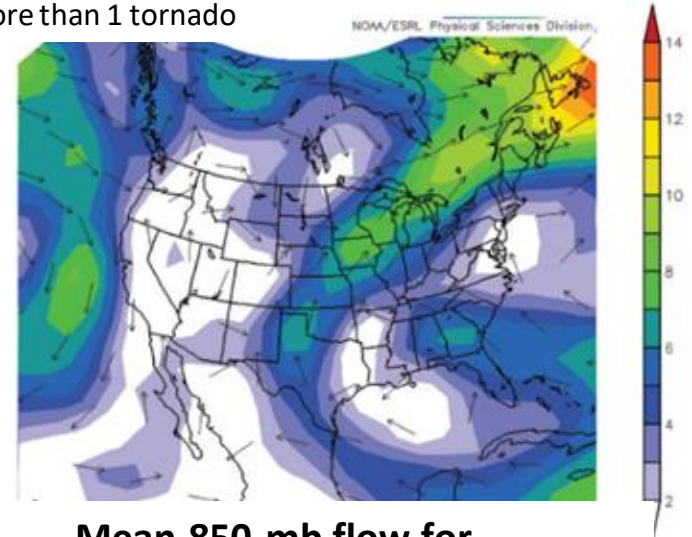
TC TORNADO FORECASTING CONCEPTS – SYNOPTIC PATTERNS

Substantially Tornadic TCs: Produce at least 4 tornadoes

Non-Substantially Tornadic TCs: Produce no more than 1 tornado



Mean 850-mb flow for
Substantially Tornadic TCs



Mean 850-mb flow for
Non-Substantially Tornadic TCs

Fig. 4(c).

-850-mb flow field -- associated with subst. tornadic TCs -- well organized, large, and directionally-symmetric, with strongest flow in NE semicircle of cyclonic flow envelope

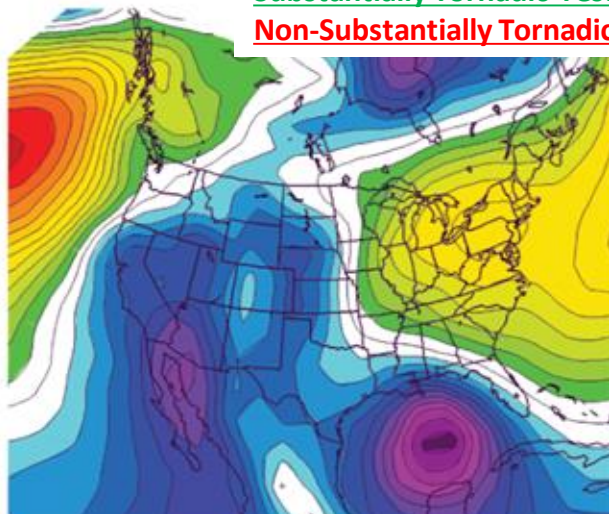
-In this region, SRH will be maximized, enhancing tornadogenesis potential

TC TORNADO FORECASTING CONCEPTS – SYNOPTIC PATTERNS

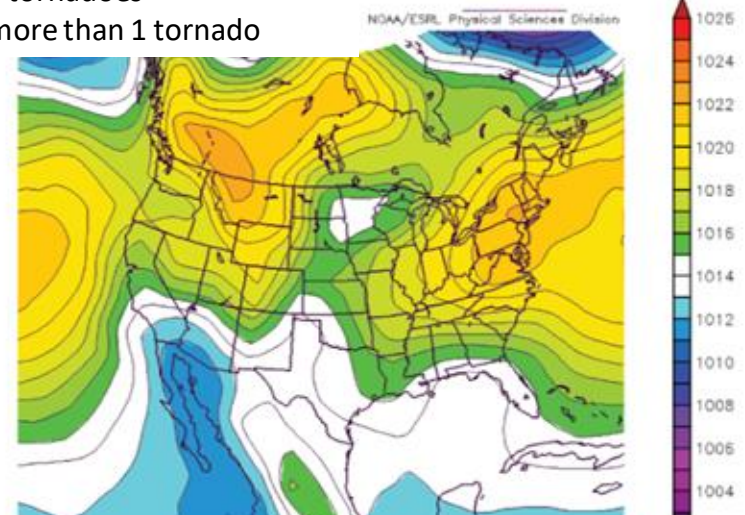
Substantially Tornadic TCs: Produce at least 4 tornadoes

Non-Substantially Tornadic TCs: Produce no more than 1 tornado

Fig. 5(c).



Mean MSLP for
Substantially Tornadic TCs



Mean MSLP for
Non-Substantially Tornadic TCs

-The area of low pressure associated with subst. tornadic TCs well-defined and symmetric, as opposed to a broad trough

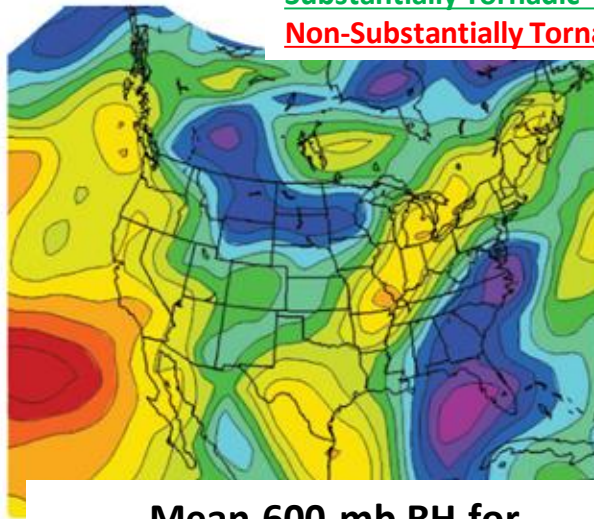
-Pressure gradient maximized in NE semicircle. In this region, SRH will be maximized, enhancing tornado potential

TC TORNADO FORECASTING CONCEPTS – SYNOPTIC PATTERNS

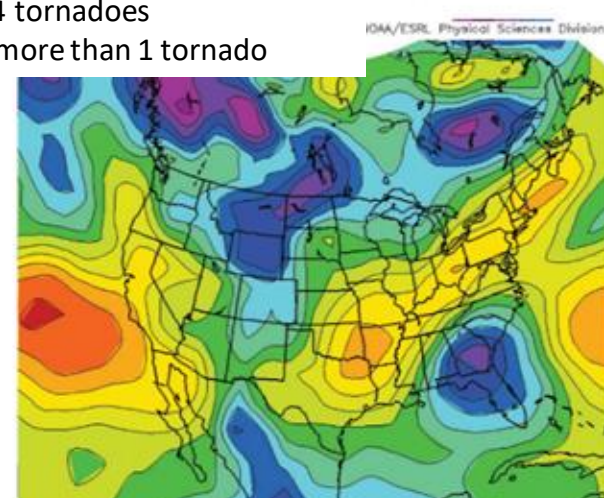
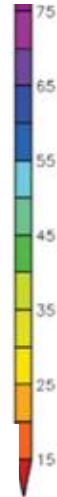
Substantially Tornadoic TCs: Produce at least 4 tornadoes

Non-Substantially Tornadoic TCs: Produce no more than 1 tornado

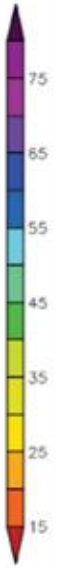
Fig. 6(c).



Mean 600-mb RH for
Substantially Tornadoic TCs



Mean 600-mb RH for
Non-Substantially Tornadoic TCs

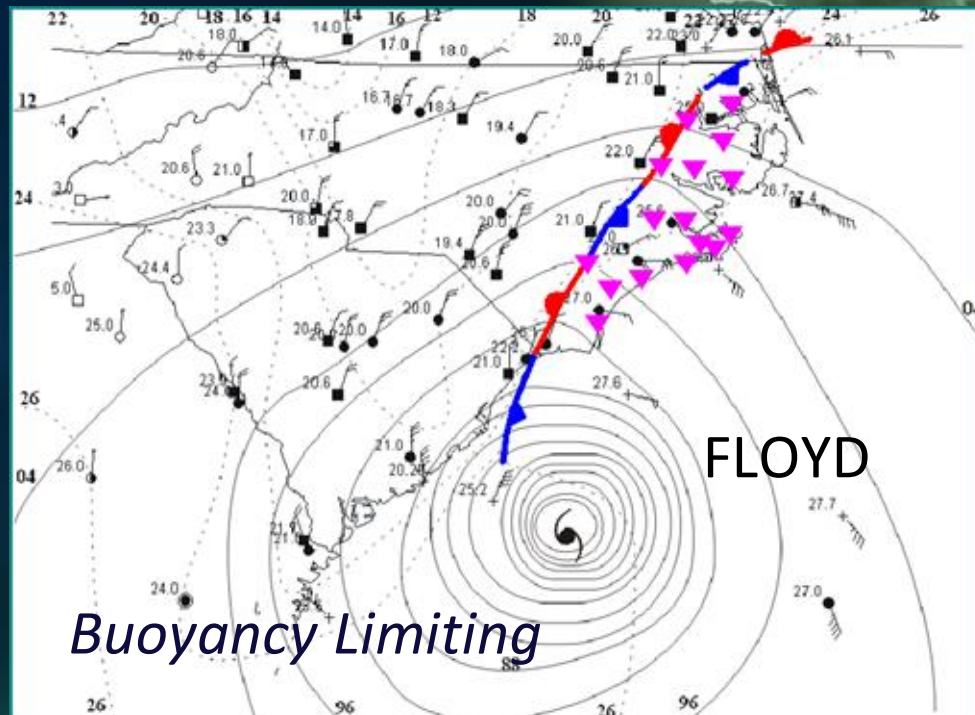
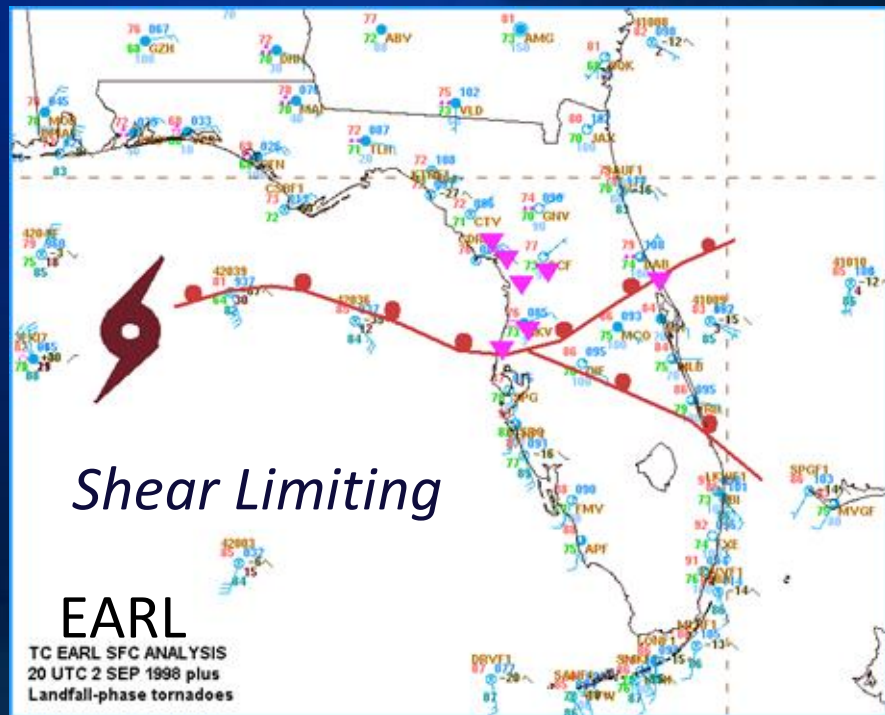


-Presence of a spatially-broad, yet strong, horizontal gradient in mid-level moisture is found over NW semicircle of cyclonic flow envelope

-Dry air driving this gradient enhances low-level buoyancy in vicinity of rain bands through mid-level dry air entrainment into the TC

TC TORNADO FORECASTING CONCEPTS – MESOSCALE BOUNDARIES

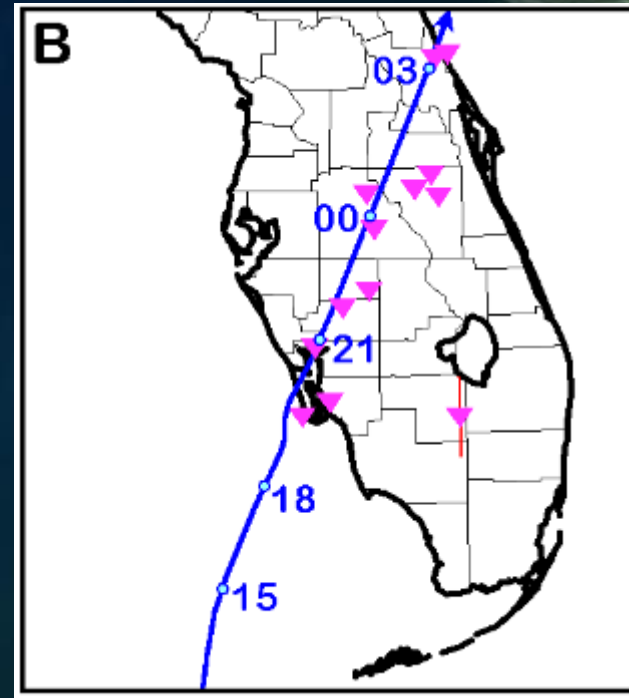
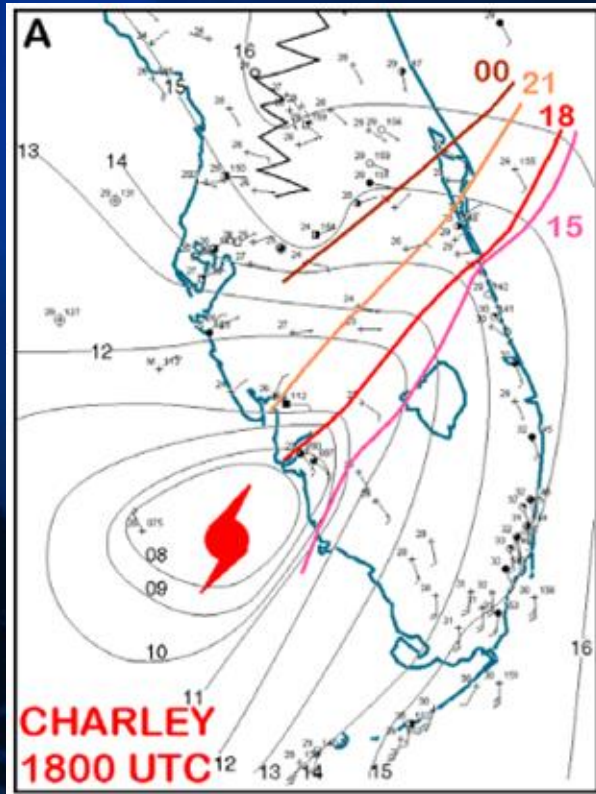
Baroclinic and wind boundaries can influence threat



Favorable buoyancy on both sides, only favorable shear on cool side.

Favorable shear on both sides, only favorable buoyancy on warm side.

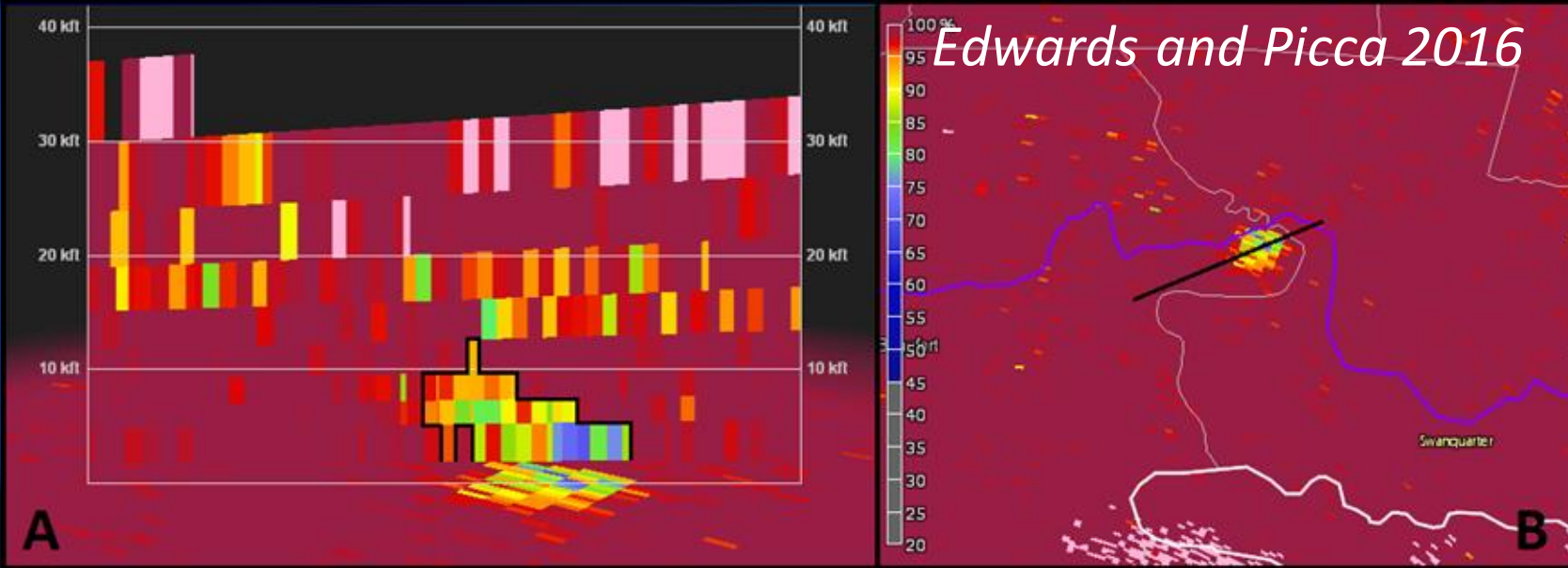
TC TORNADO FORECASTING CONCEPTS – MESOSCALE BOUNDARIES



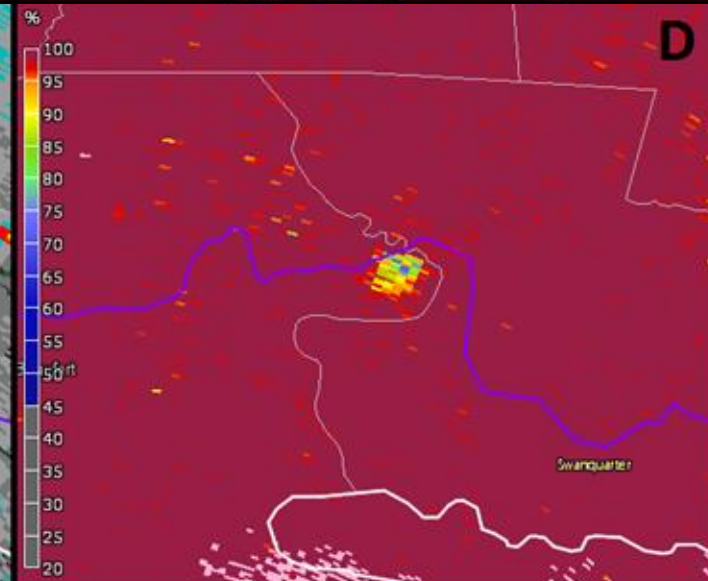
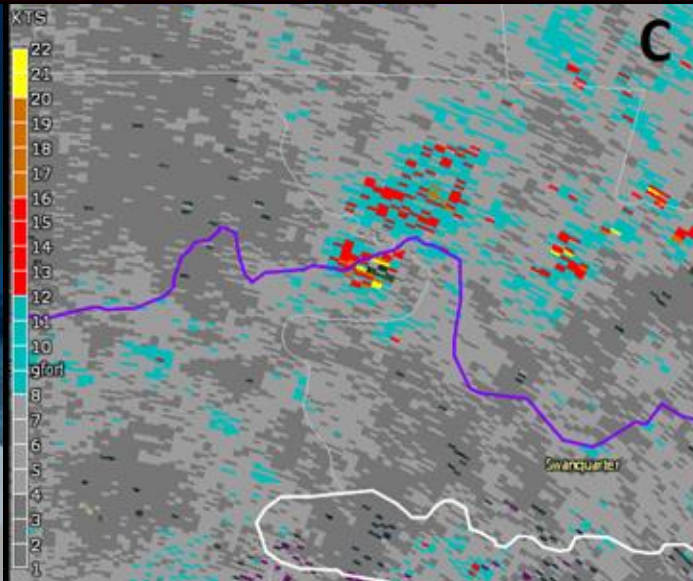
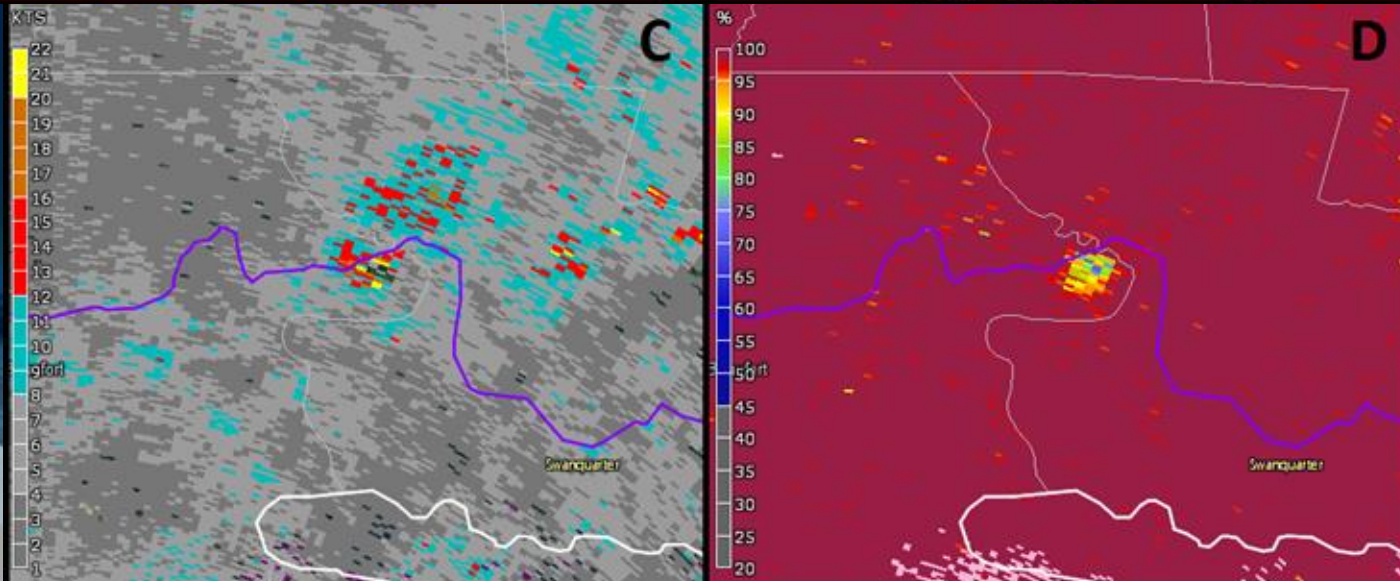
Buoyancy-Shear Overlap

**Favorable buoyancy on one side,
favorable shear on the other. (Slim
corridor of overlap near the boundary)**

RADAR CONCEPTS for TC TORNADOES



Edwards and Picca 2016



**Beaufort Co.
N. Carolina
27 Aug 2011
0203 UTC**

RADAR CONCEPTS for TC TORNADOES

Tornado Warned Supercell

near Norge OK

TC

Erin

PAR VCP 12 60° sector

0.5° oversampling in azimuth

Interval ~ 43 s

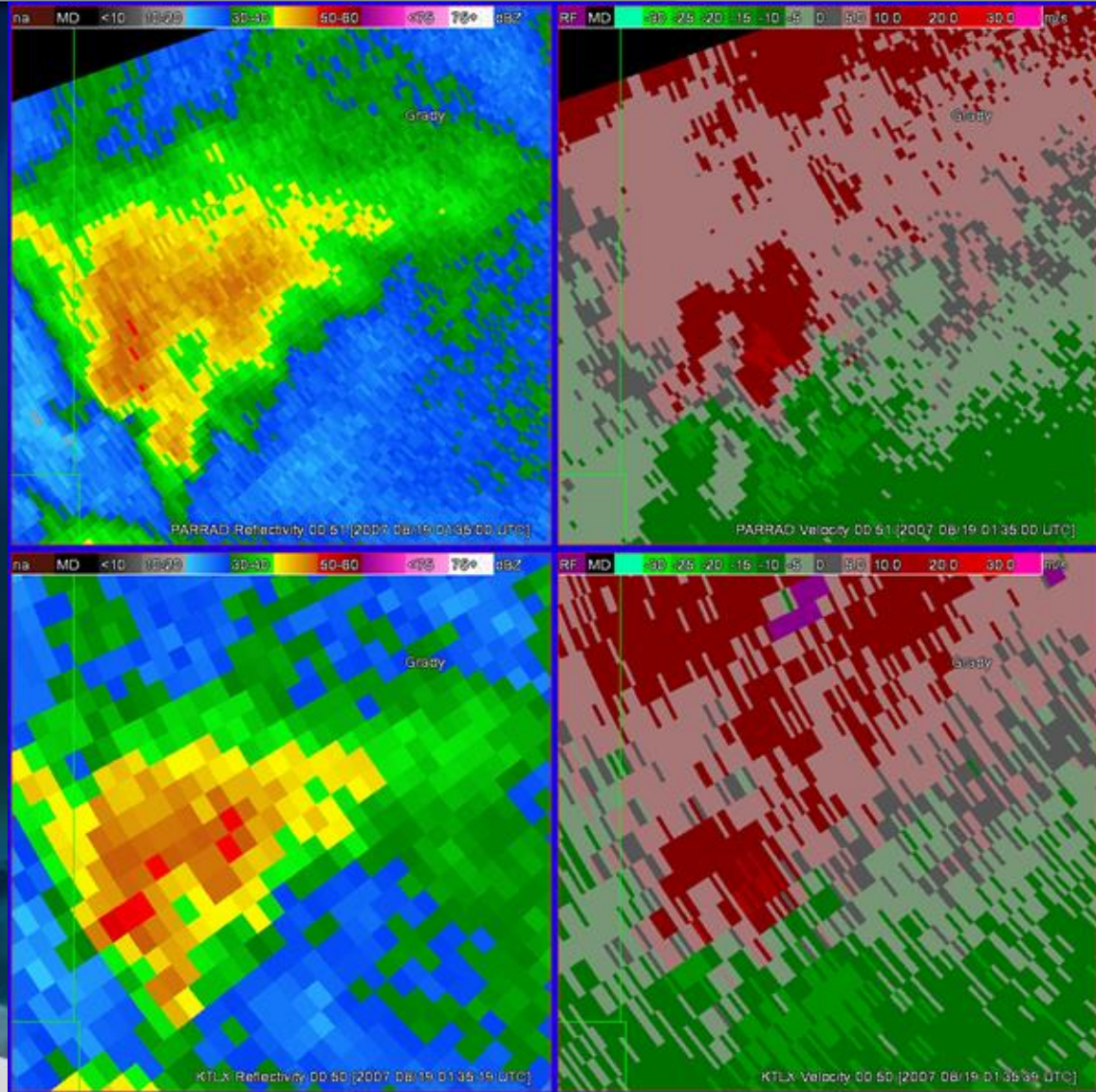
19 Aug 2007

0135-0154 UTC

WSR-88D

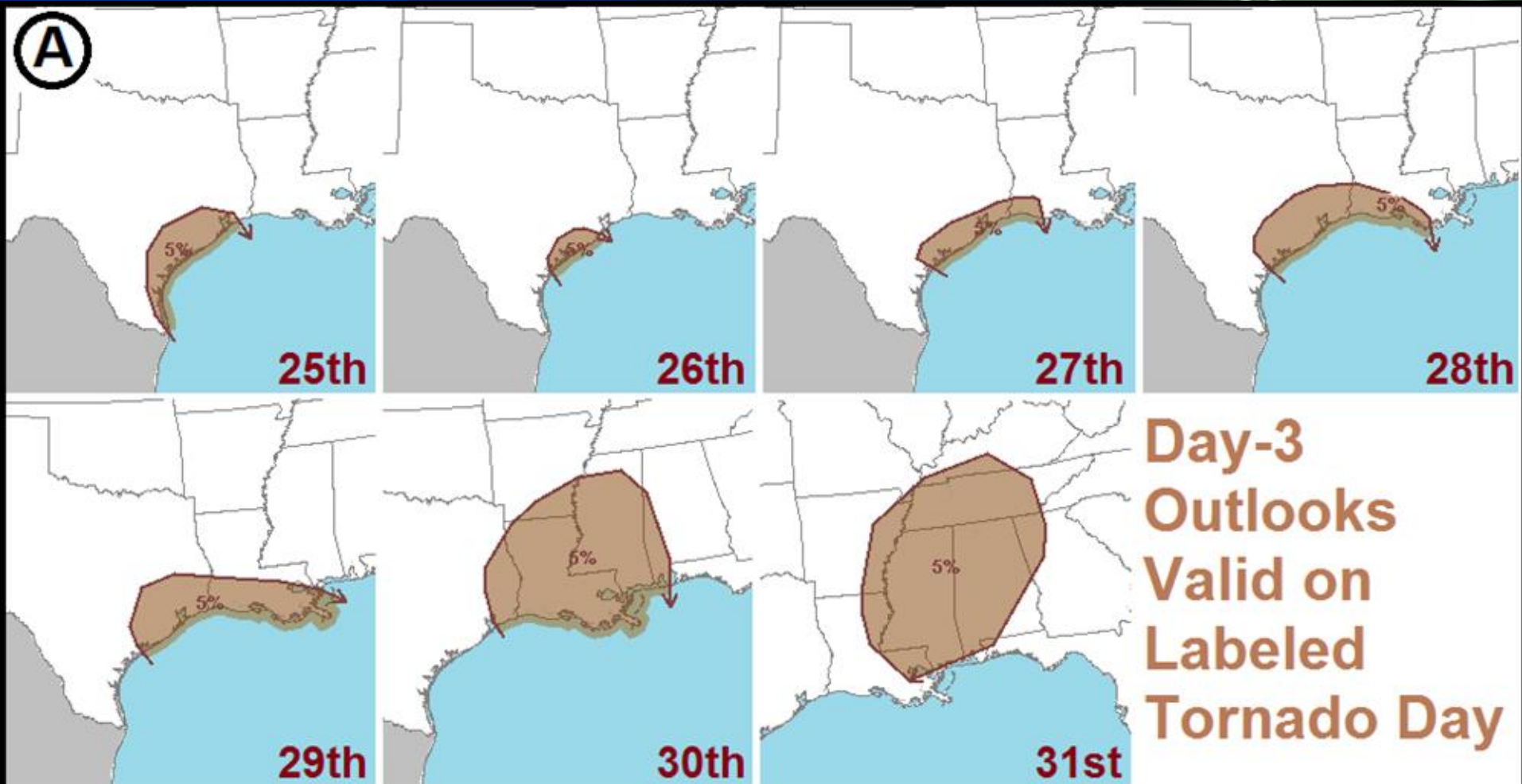
VCP 12

Interval ~ 4.1 min



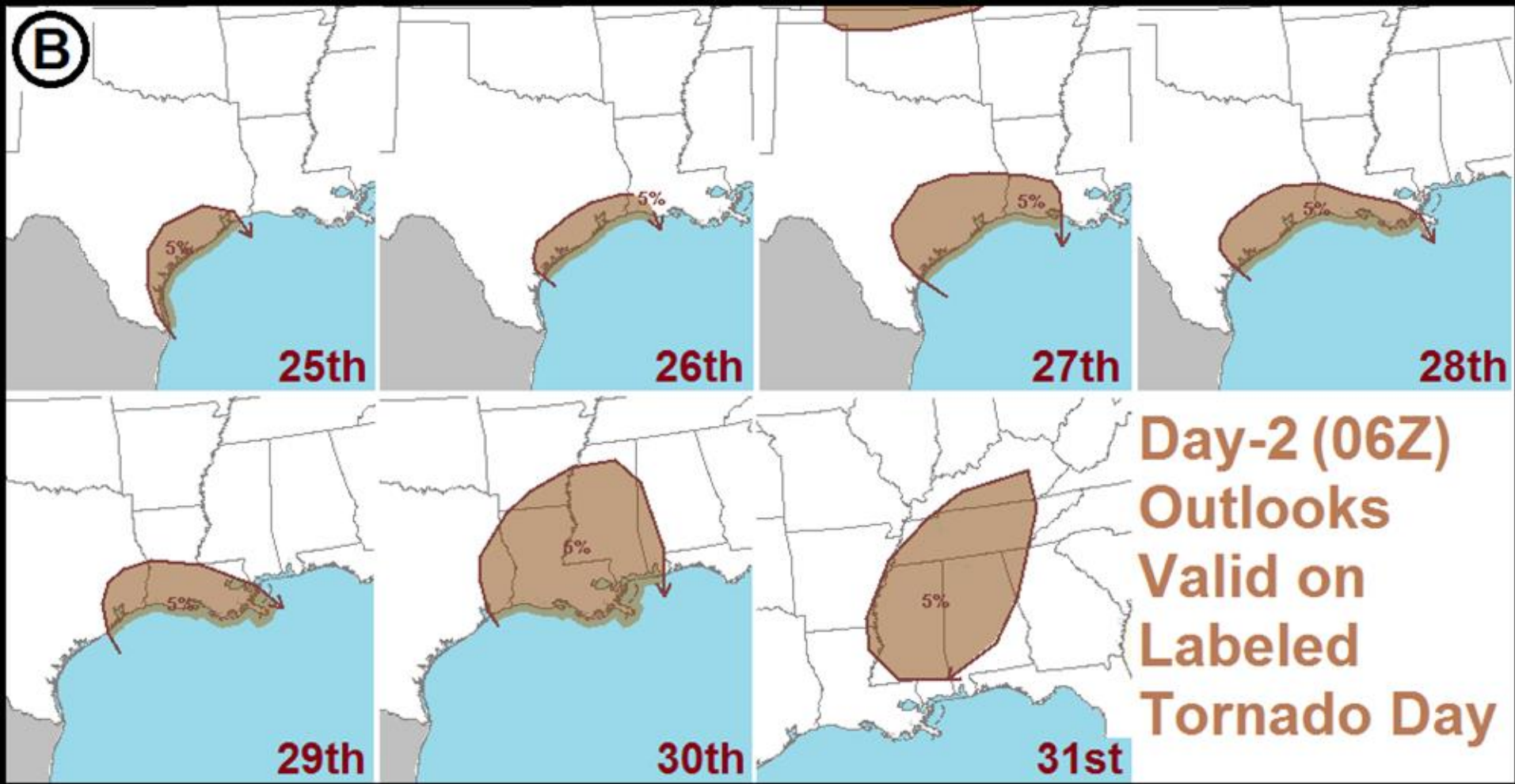
SPC FORECAST EXAMPLES FOR TCs

OUTLOOKS (Day-3 examples for HARVEY)



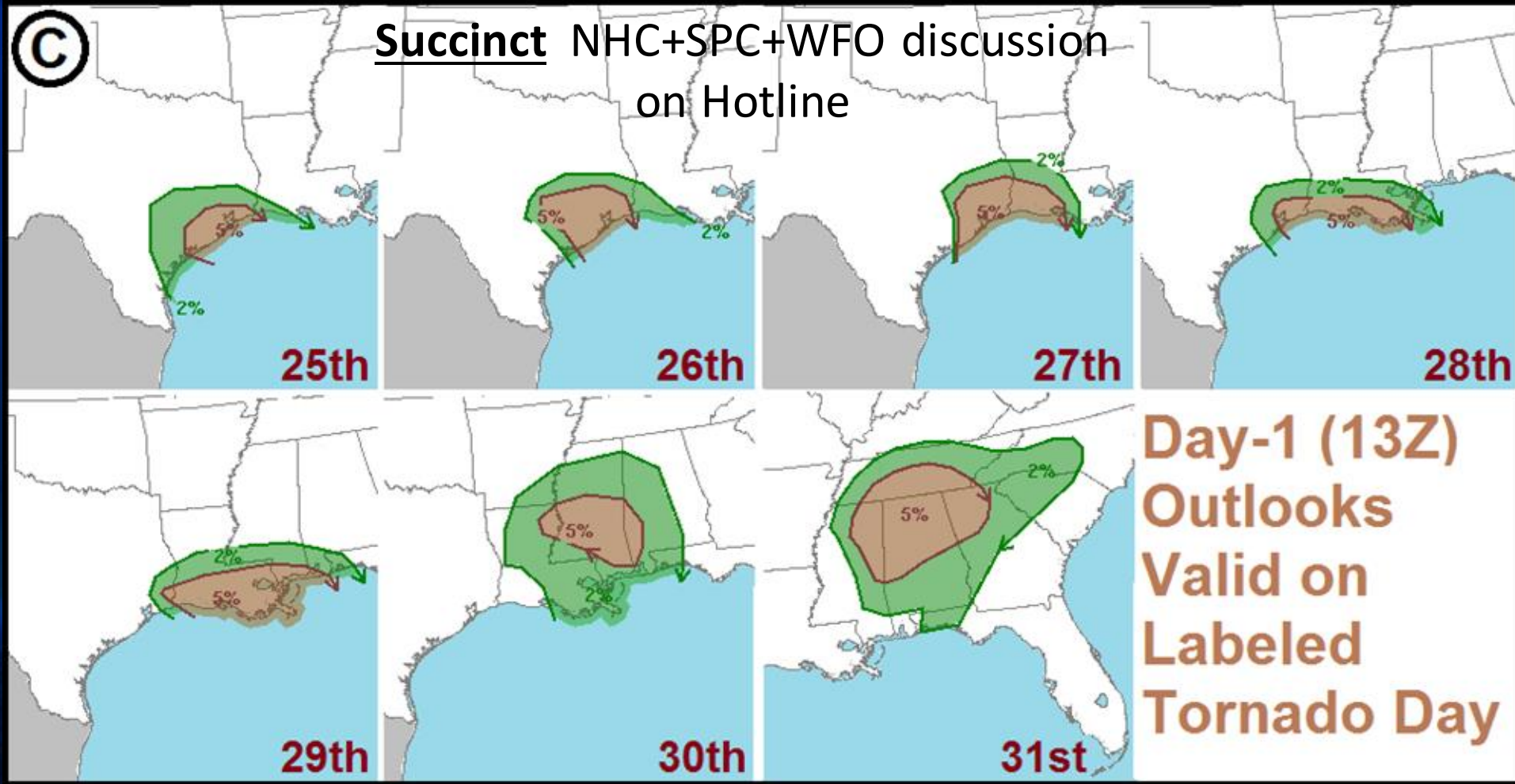
SPC FORECAST EXAMPLES FOR TCs

OUTLOOKS (Day-2 examples for HARVEY)

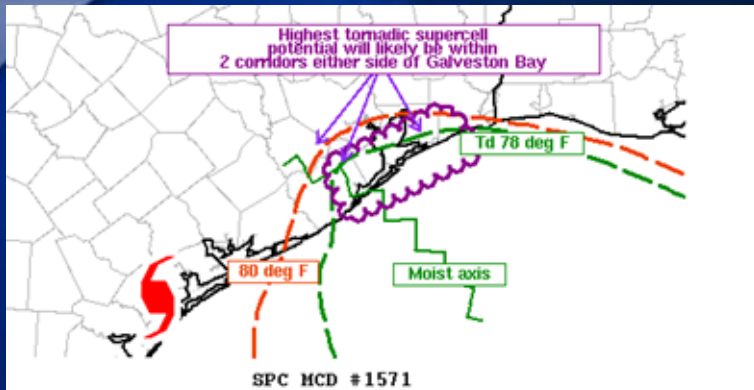


SPC FORECAST EXAMPLES FOR TCs

OUTLOOKS (Day-1 examples for HARVEY)



SPC FORECAST EXAMPLES FOR TCs



Mesoscale Discussion 1571
NWS Storm Prediction Center Norman OK
0117 AM CDT Sat Aug 26 2017

Areas affected...Upper Texas Coast

Concerning...Tornado Watch 465...

Valid 260617Z - 260645Z

The severe weather threat for Tornado Watch 465 continues.

SUMMARY...The highest potential for tornadic supercells will likely be within 2 corridors either side of Galveston Bay (Brazoria/Fort Bend and Chambers Counties) for the next 1-2 hours. A new tornado watch will be issued before 0700 UTC.

DISCUSSION...Latest subjective surface mesoanalysis indicates the 80 degree F isotherm encompasses Brazoria county northeast into Chambers county. The northwest area of a plume of 78 degree F dewpoints protrudes northwest from the northwest Gulf of Mexico into the immediate coastal area of Brazoria county. The latest RAP forecast sounding appears to be representative of the surface and around 1400 J/kg MLCAPE is noted. When inputting storm motion (135 degrees at 35-kt), the KHGX VAD indicates around 200 m²/s² 0-1 km SRH. With robust updrafts implied by the convective structures (echo tops 35-40k ft), the environment will continue to be favorable for low-level mesocyclones and a tornado risk over the next 1-2 hours.

..Smith.. 08/26/2017

MESOSCALE DISCUSSIONS

Example:
HARVEY (2017)

Issued for watch
potential or watch
updates

Situational, no
deadlines nor rigid
thresholds

SPC FORECAST EXAMPLES FOR TCs

WATCHES

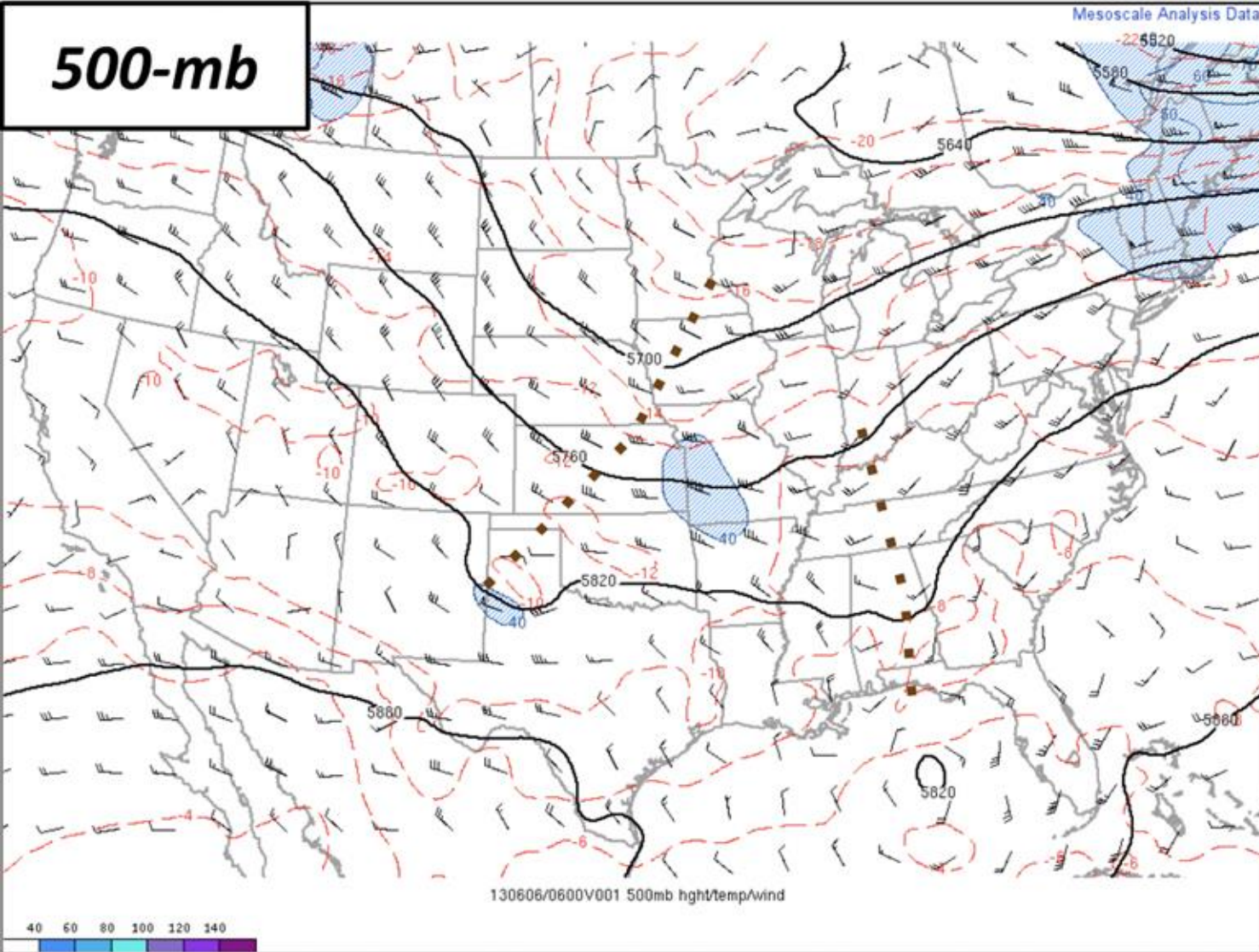
- Coordinated SPC+WFO
- County based
- Cleared / extended by WFO
- Legacy polygon for aviation
- Tornado probabilities offered with watch
- Targeted to situational tornado threat
- Not necessary for all TCs. *Some TCs don't produce tornadoes!*



Example from
Harvey (2017)

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

500-mb

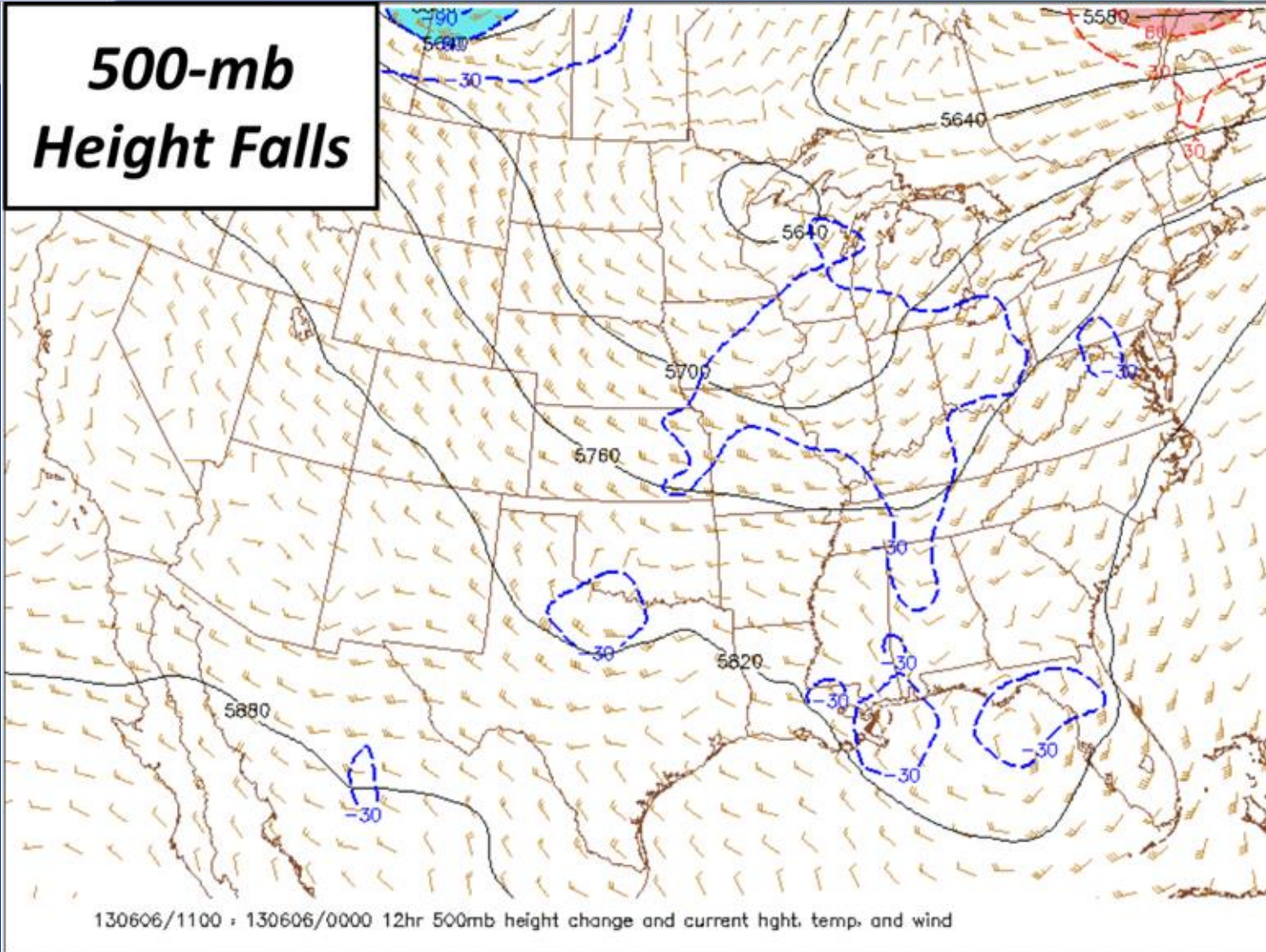


-Southern-stream shortwave trough and accompanying upstream DAVA/subsidence-induced drying tracking eastward across SE CONUS

-Introduces the potential for baroclinic-related processes to inject into the cyclonic flow envelope -- fostering opportunities for a favorable meso environment for tornadogenesis

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

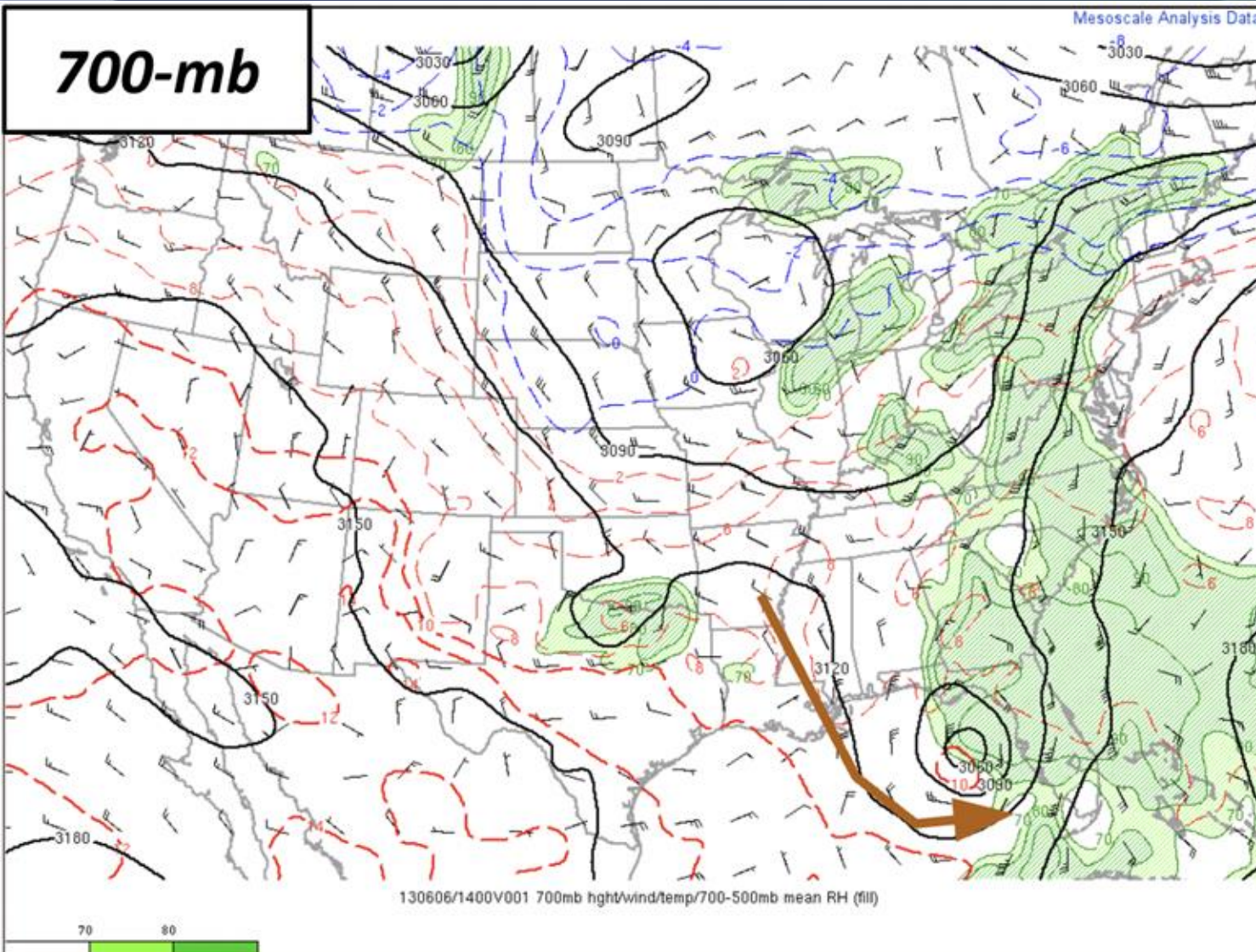
500-mb Height Falls



-Mid-level height-falls associated with baroclinic shortwave trough spreading eastward into the tropical environment

-Essentially injecting baroclinicity into the cyclonic flow envelope -- facilitating a conducive mesoscale environment for tornadogenesis

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

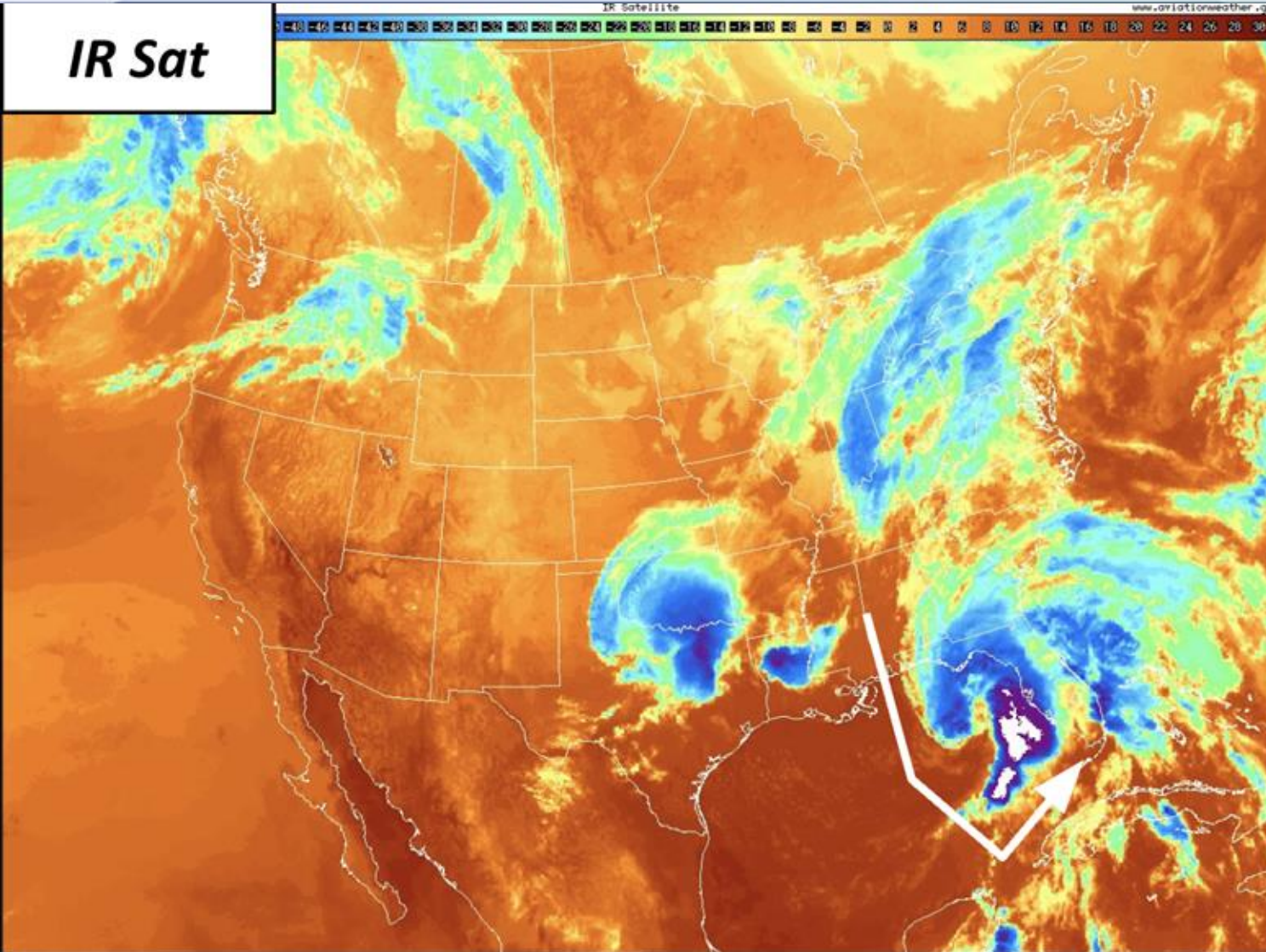


-Mid-level dry air (associated with aforementioned shortwave trough) cyclonically wrapping into the TC

-This allows for favorable breaks between convection and resulting potent/non-overtured air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

IR Sat

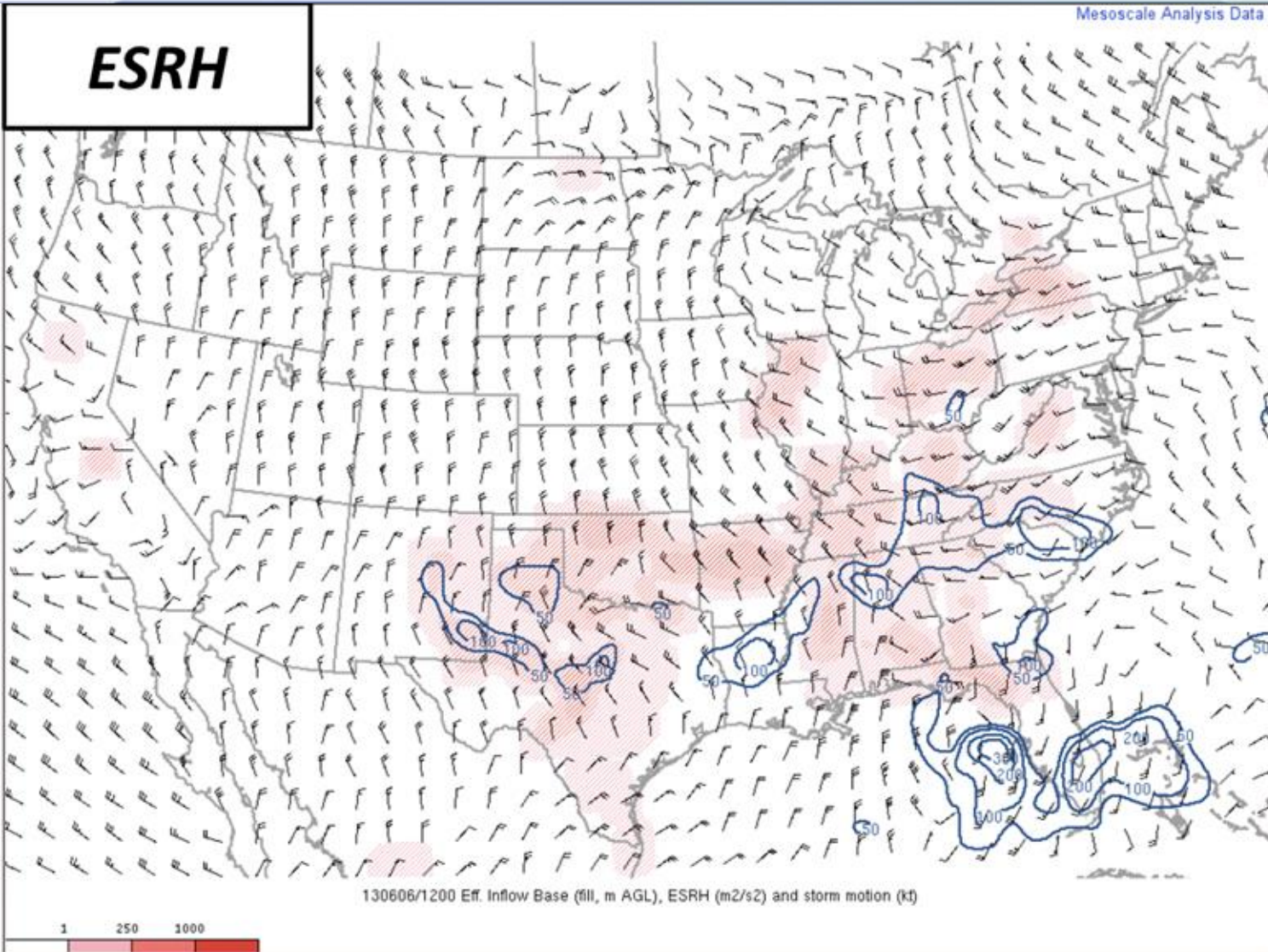


-Another depiction of dry air cyclonically enveloping the TC

- Mid-level dry air reduces mid-level theta-E values -- resulting in higher convective instability

-Dry slots can promote enhanced heating/differential heating, setting up temporary baroclinic zones

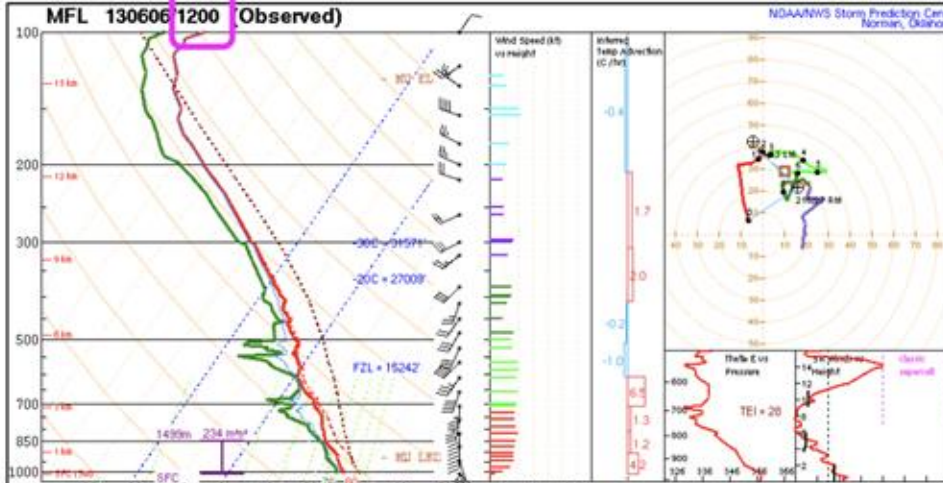
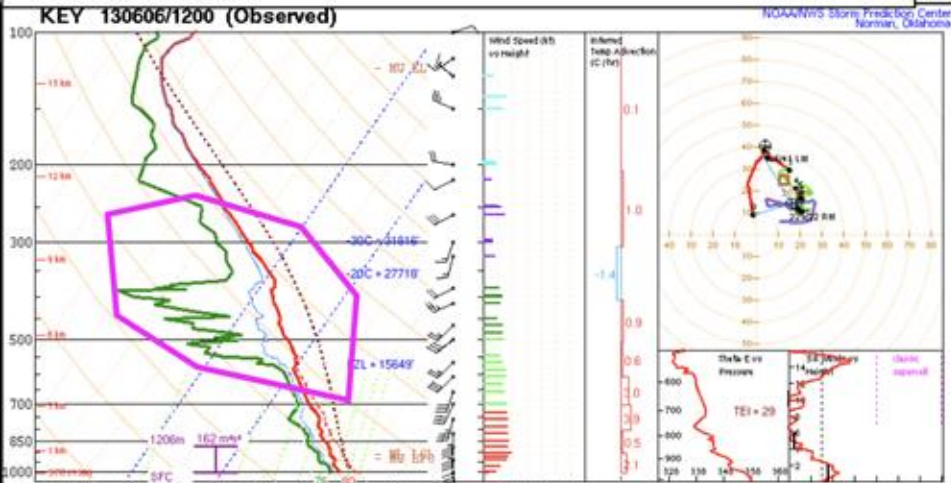
TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



-Favorable environmental storm-relative helicity -- supportive of immediate updraft rotation -- owing to ingestion of air following helical trajectories into updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

Upstream air mass at KEY depicts dry mid/upper-levels and steeper mid-level lapse rates (compared to downstream MFL data)



PARCEL	CAPE	CINH	LCL	LI	LFC	EL
SURFACE	2374	-9	327m	-6	752m	49941'
MIXED LAYER	1344	-18	656m	-5	1455m	46620'
FCST SURFACE	2455	0	1309m	-6	1309m	49941'
MU (1000 mb)	2632	-4	324m	-7	691m	50706'

SRH(m2h2)	Shear(k1)	MixWind	SRW	
SFC - 1 km	173	30	179/08	130/22
SFC - 3 km	211	26	187/02	145/21
Eff Inflow Layer	162	27	180/00	133/22
SFC - 6 km	24	197/09	151/16	
SFC - 8 km	21	200/08	152/14	
Lower Half Storm Depth	24	200/08	151/14	
Cloud Bearing Layer	31	205/27	154/11	

BRN Shear	4-6km SR Wind
23 m/hp	234/7 kt

Storm Motion Vectors
Bunkers Right = 229/22 kt
Bunkers Left = 186/41 kt
Corrid Downshear = 245/32 kt
Corrid Upshear = 301/16 kt

1km & 5km AgL Wind Ratio
1.0

*** BEST GUESS PRECIP TYPE ***	
Rain.	
Based on sfc temperature of 80.2 F.	
SARS - Sounding Analogs	
SUPERCELL	SGFNT HAIL
No Quality Matches	No Quality Matches
18 (no matches)	13 (no matches)
SARS: 62% TOR	SARS: 11% SIG

Supercell = 5.1
Left Supercell = 1.3
Sig Tor (CIN) = 0.0
Sig Tor (fbcd) = 0.0
Sig Hail = 0.4

700-500mb Lapse Rate = 6.0 C/km

PARCEL	CAPE	CINH	LCL	LI	LFC	EL
SURFACE	2552	-9	236m	-6	815m	48967'
MIXED LAYER	1796	-6	751m	-4	1053m	46622'
FCST SURFACE	2802	0	1201m	-6	1201m	49705'
MU (976 mb)	2612	-3	412m	-6	759m	49705'

SRH(m2h2)	Shear(k1)	MixWind	SRW	
SFC - 1 km	216	28	162/08	102/25
SFC - 3 km	247	32	176/32	120/21
Eff Inflow Layer	234	31	169/00	109/23
SFC - 6 km	31	187/32	130/16	
SFC - 8 km	32	190/31	129/14	
Lower Half Storm Depth	30	189/31	129/14	
Cloud Bearing Layer	37	196/31	136/11	

BRN Shear	4-6km SR Wind
35 m/hp	215/10 kt

Storm Motion Vectors
Bunkers Right = 216/27 kt
Bunkers Left = 174/43 kt
Corrid Downshear = 229/43 kt
Corrid Upshear = 272/19 kt

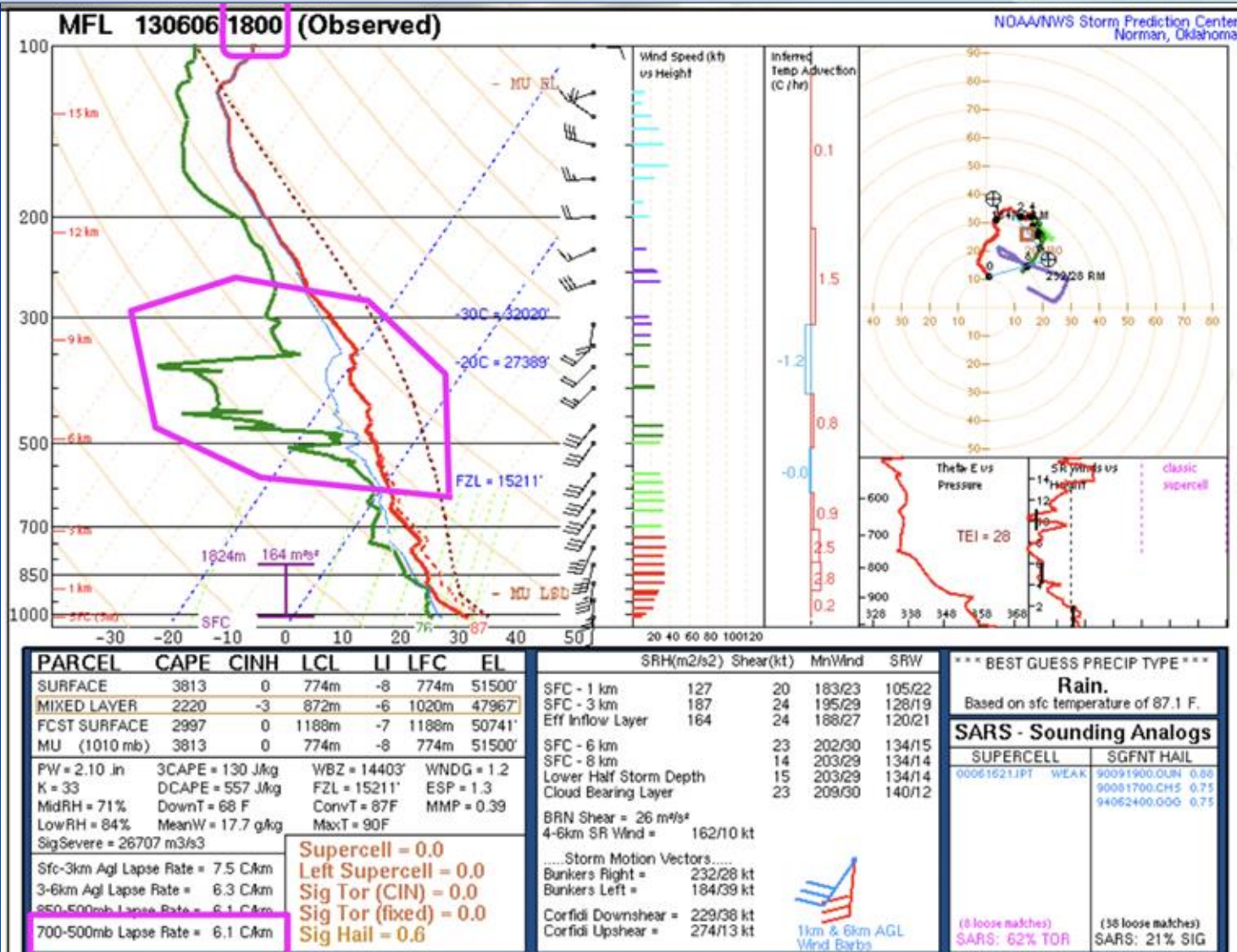
1km & 5km AgL Wind Ratio
1.0

*** BEST GUESS PRECIP TYPE ***	
Rain.	
Based on sfc temperature of 79.5 F.	
SARS - Sounding Analogs	
SUPERCELL	SGFNT HAIL
No Quality Matches	No Quality Matches
18 (no matches)	13 (no matches)
SARS: 33% TOR	SARS: 8% SIG

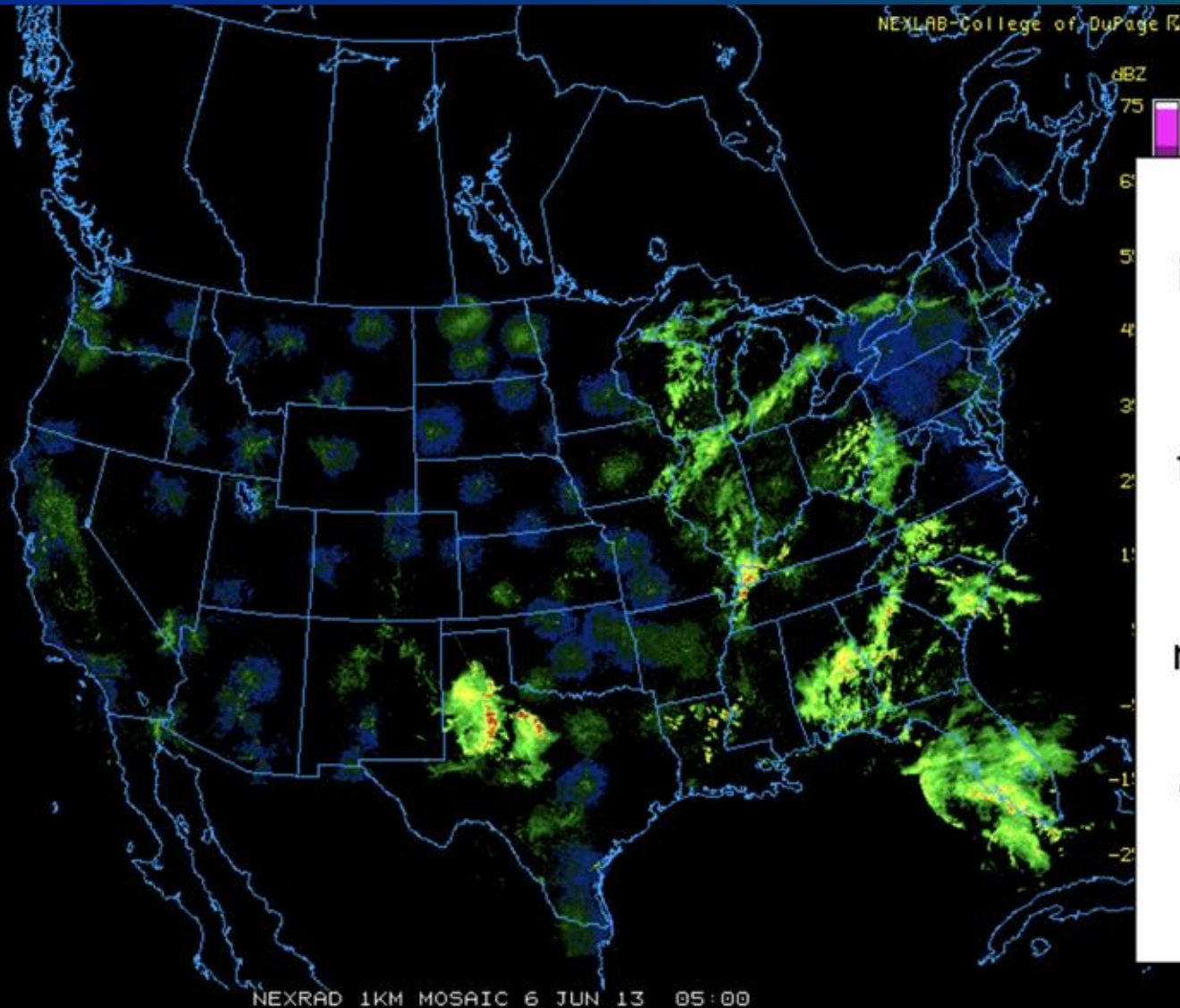
Supercell = 9.2
Left Supercell = 1.4
Sig Tor (CIN) = 1.4
Sig Tor (fbcd) = 1.9
Sig Hail = 0.4

700-500mb Lapse Rate = 5.4 C/km

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

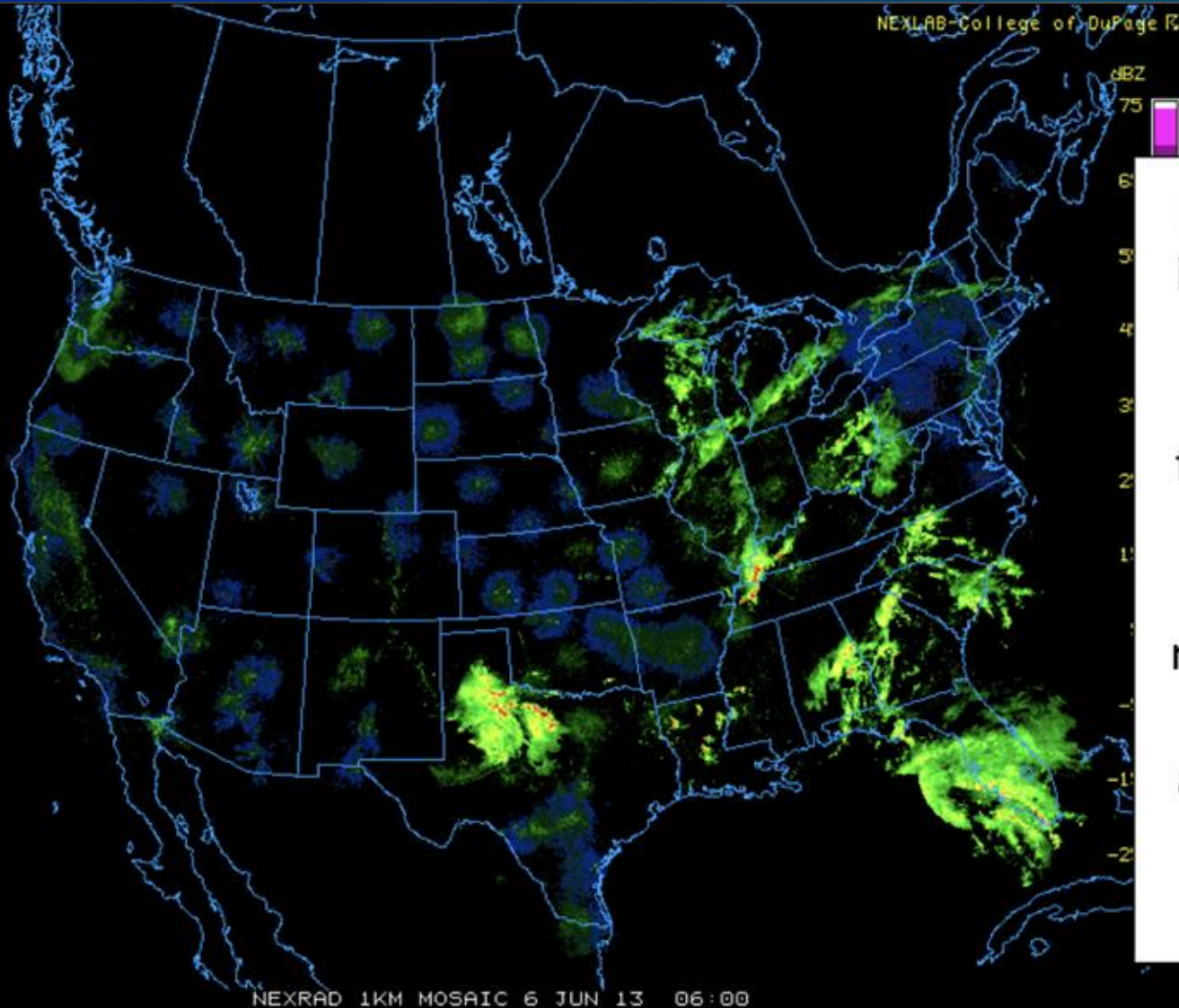


TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



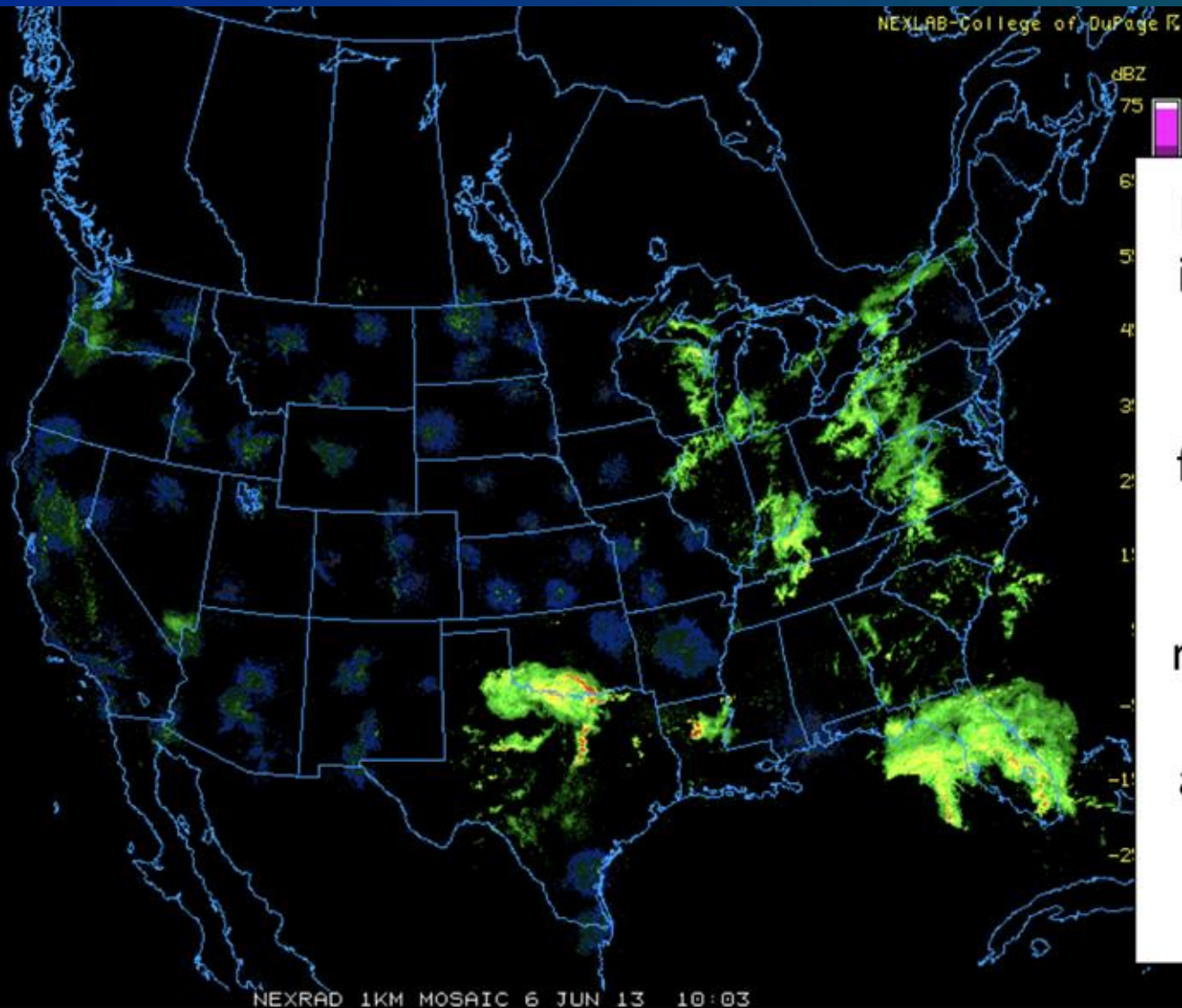
Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overtuned air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



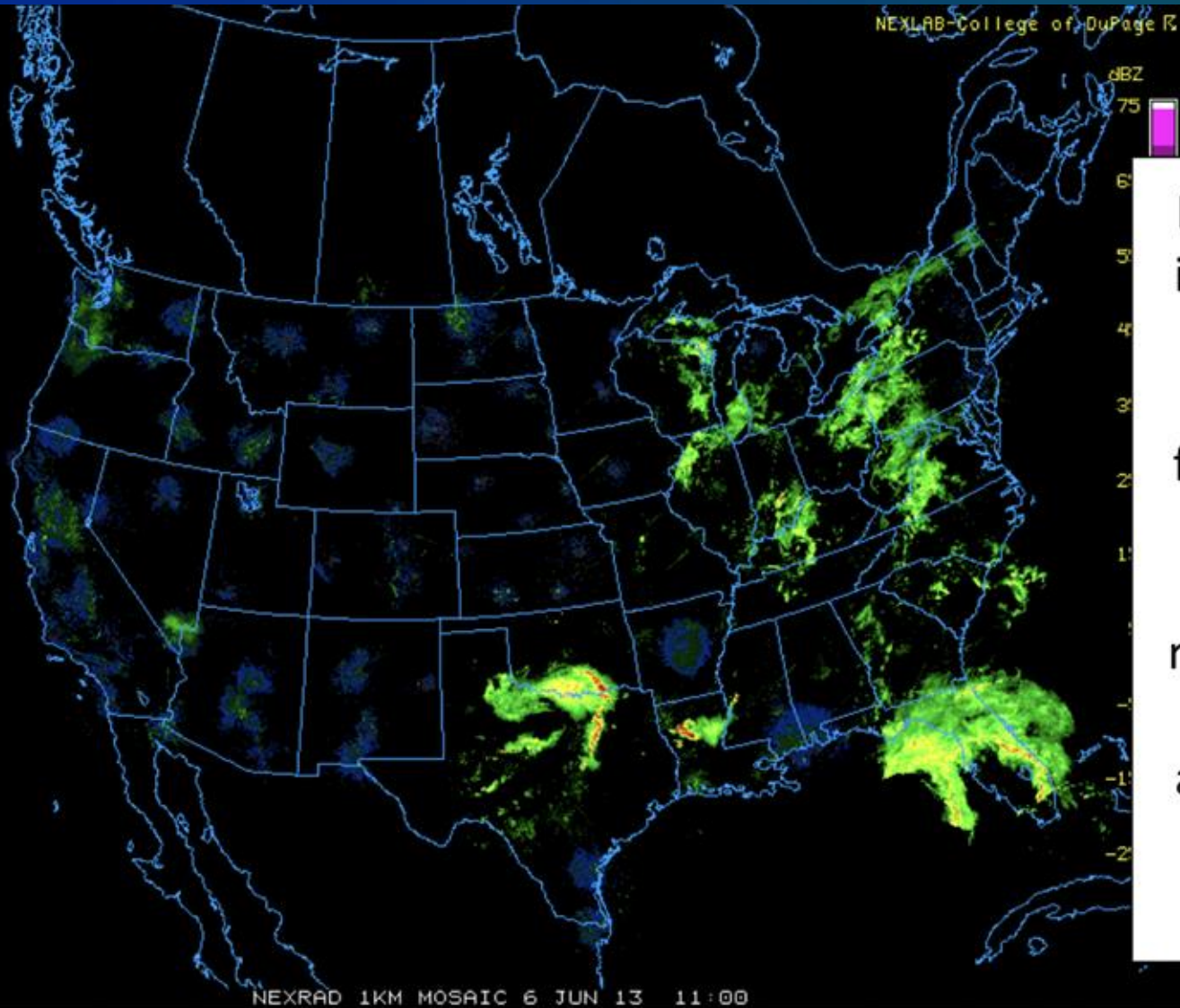
Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overtured air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



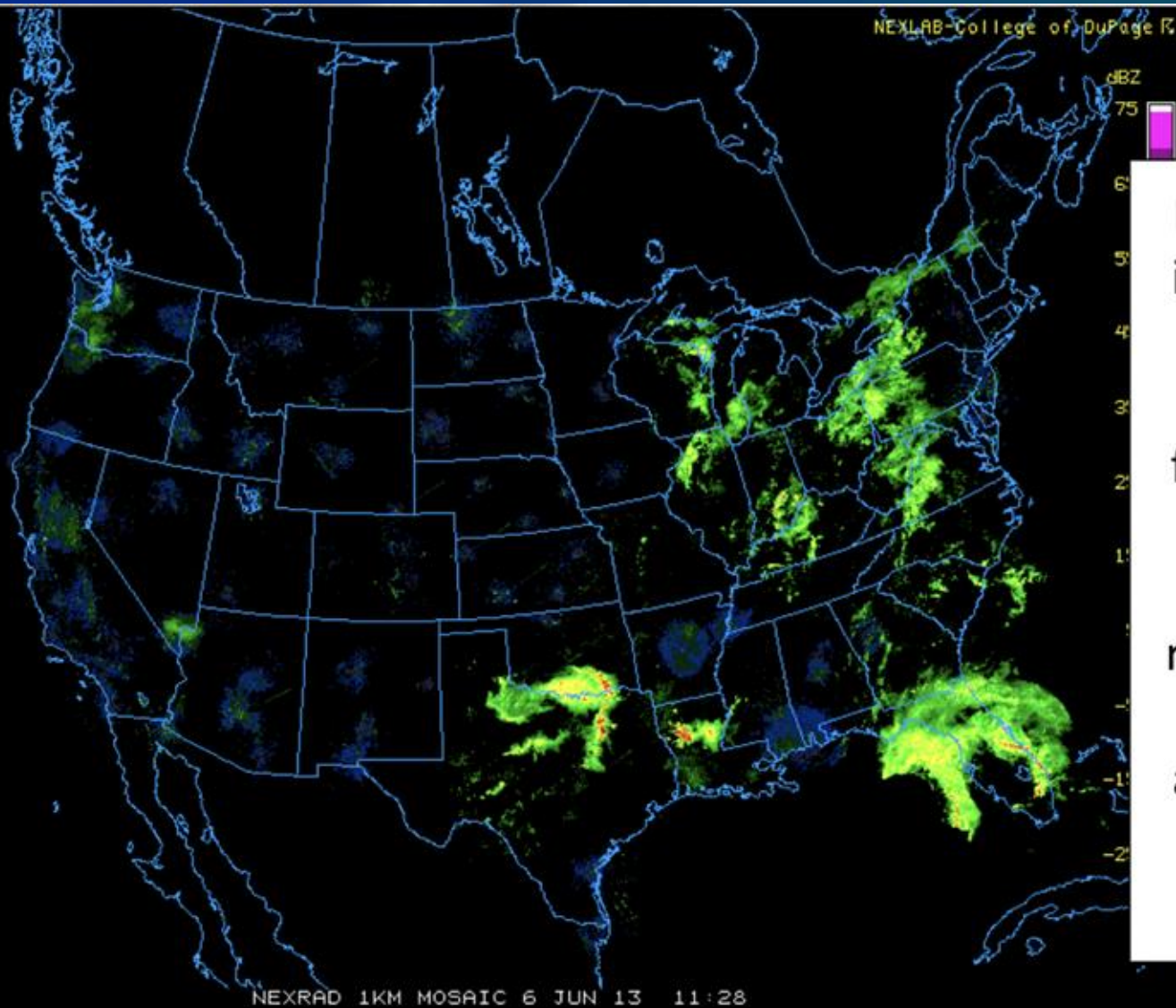
Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overturnd air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



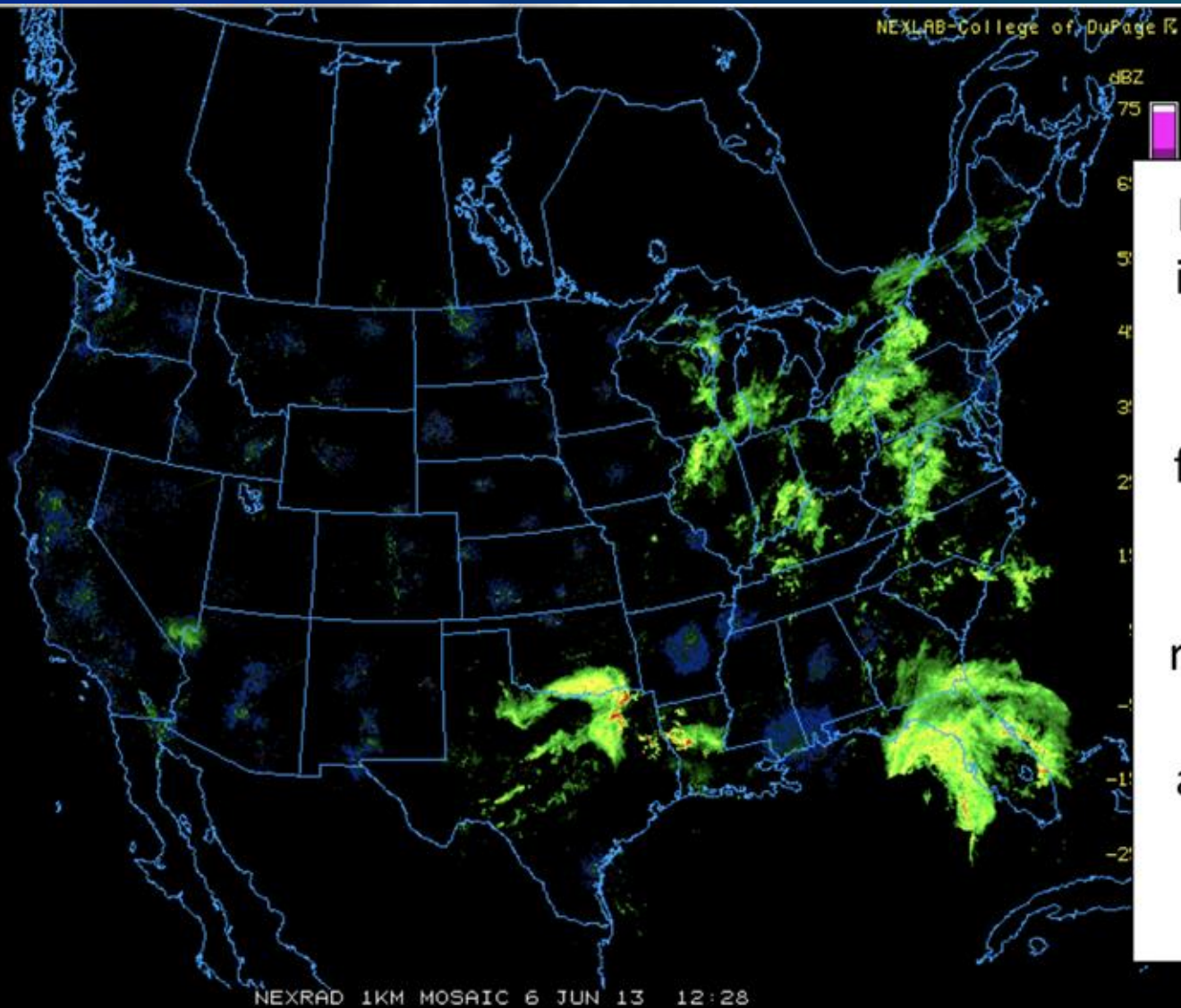
Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overturnd air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)



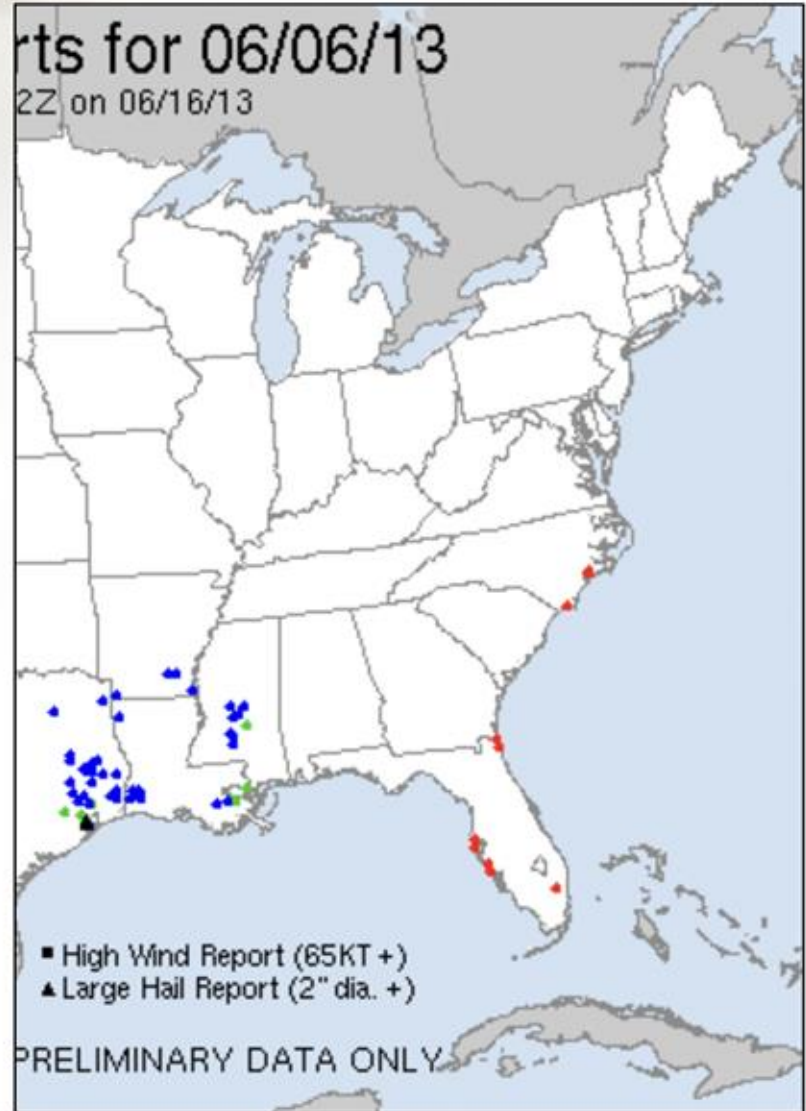
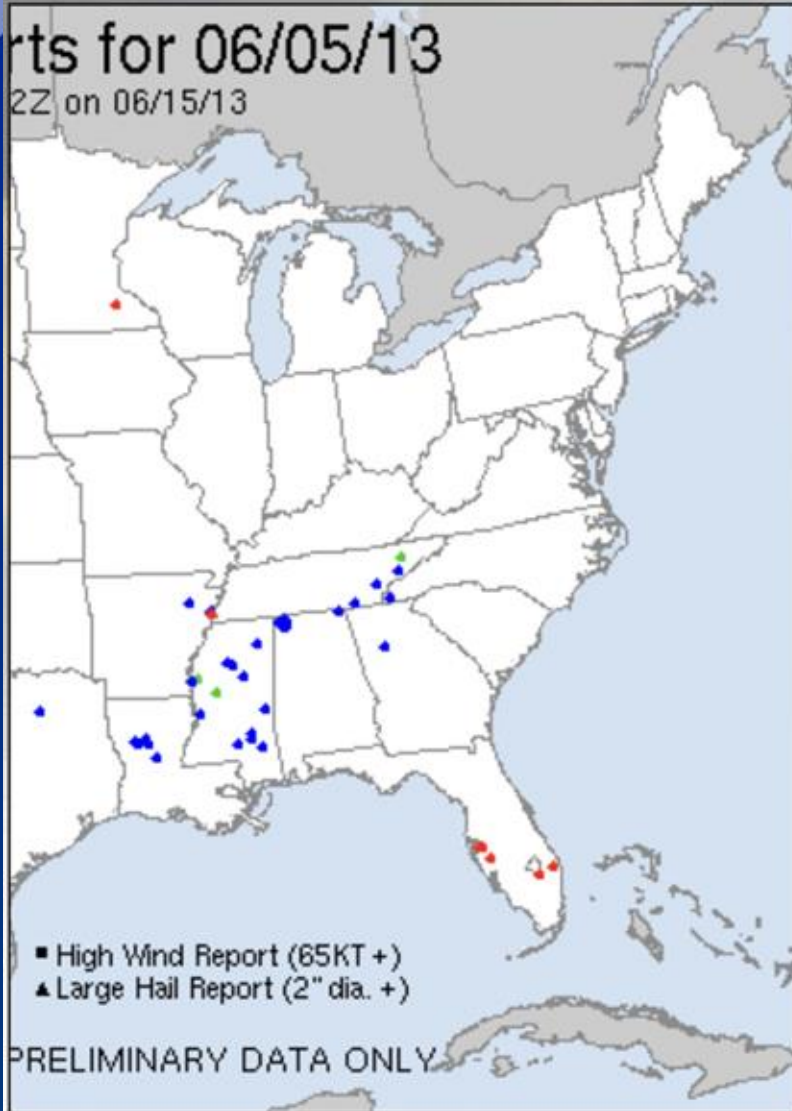
Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overturnd air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

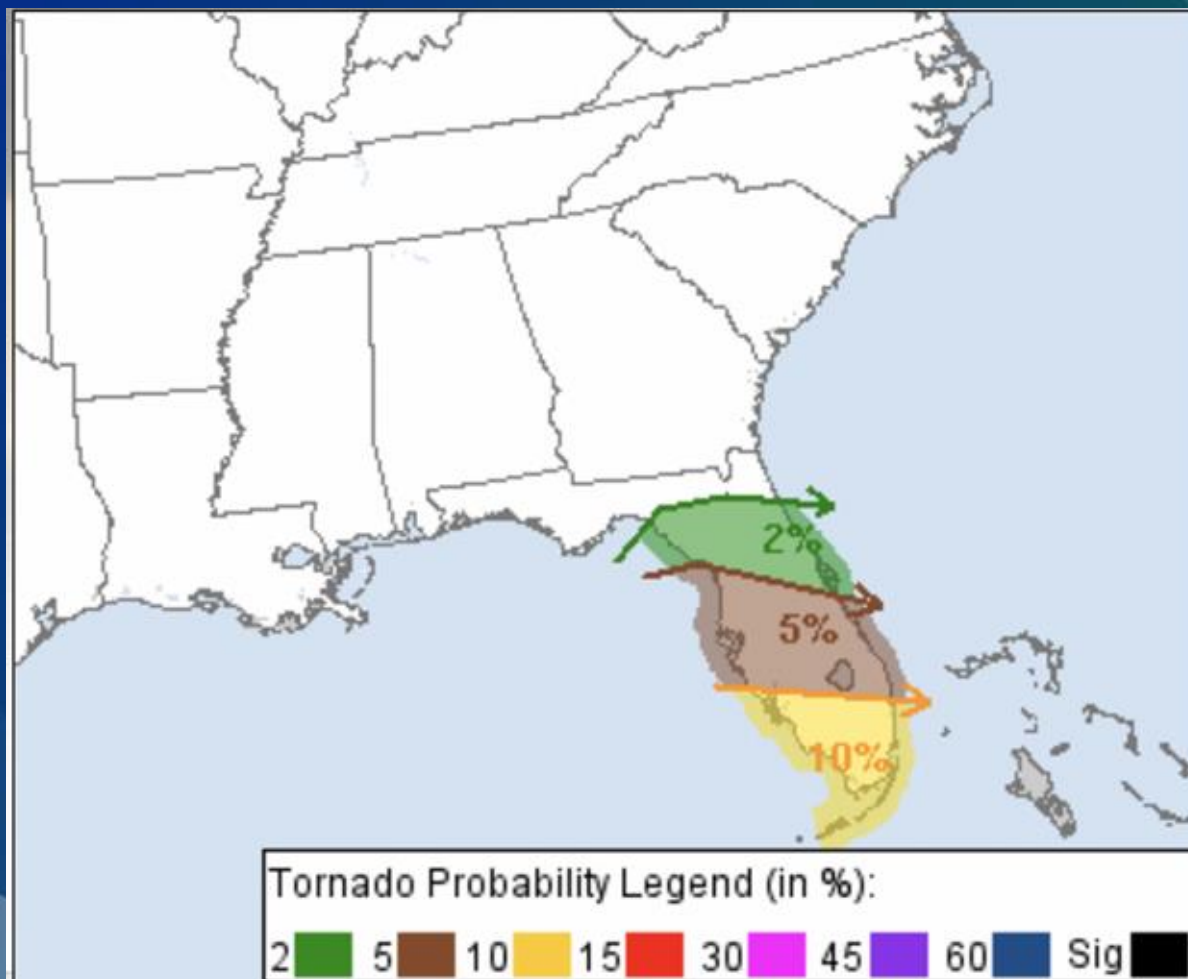


Dry air intrusion into the cyclonic flow envelope allowed for favorable breaks between convection and resulting potent/non-overturnd air to ingest into convective updrafts

TC TORNADO EXAMPLE CASES 1 (ANDREA 2013)

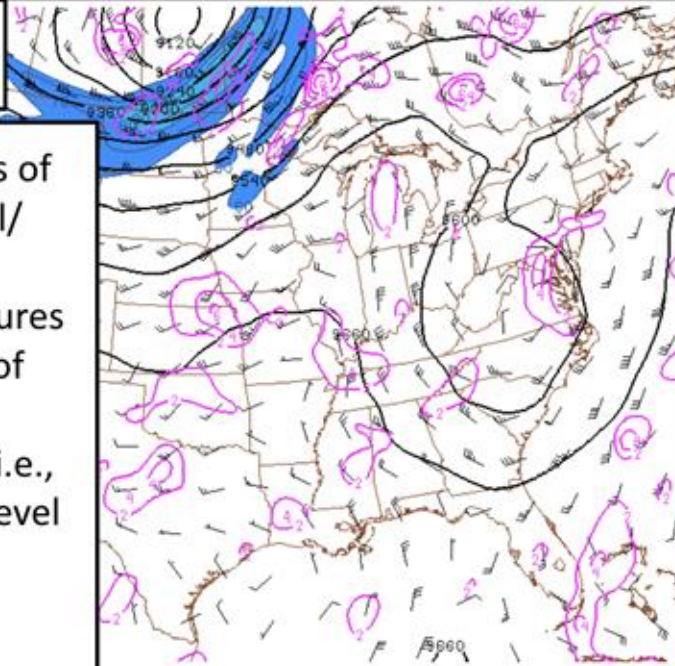


TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

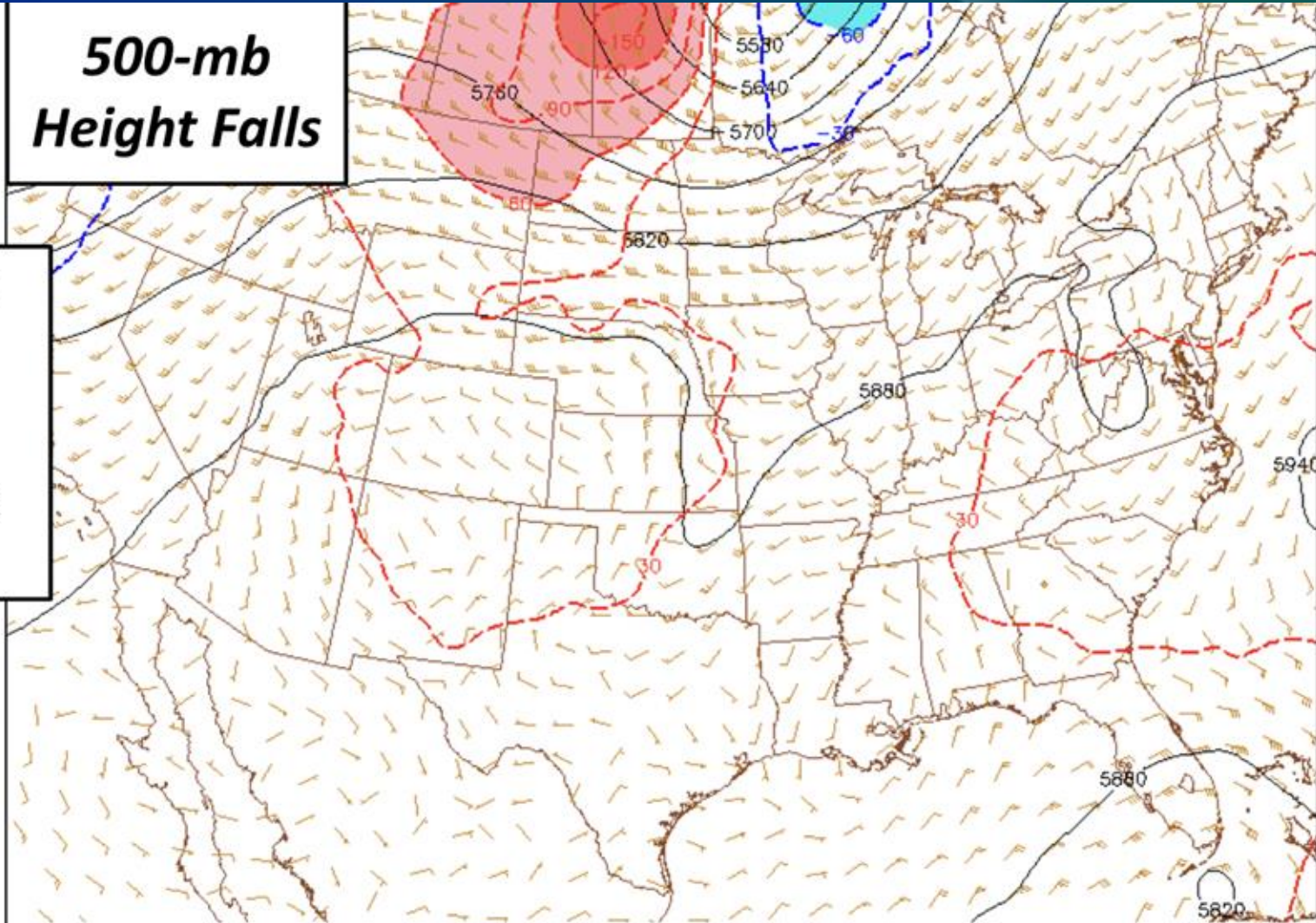
300-mb



TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

**500-mb
Height Falls**

-Lack of mid-level
height falls
corroborate
previous notions
(lack of baroclinic
features)



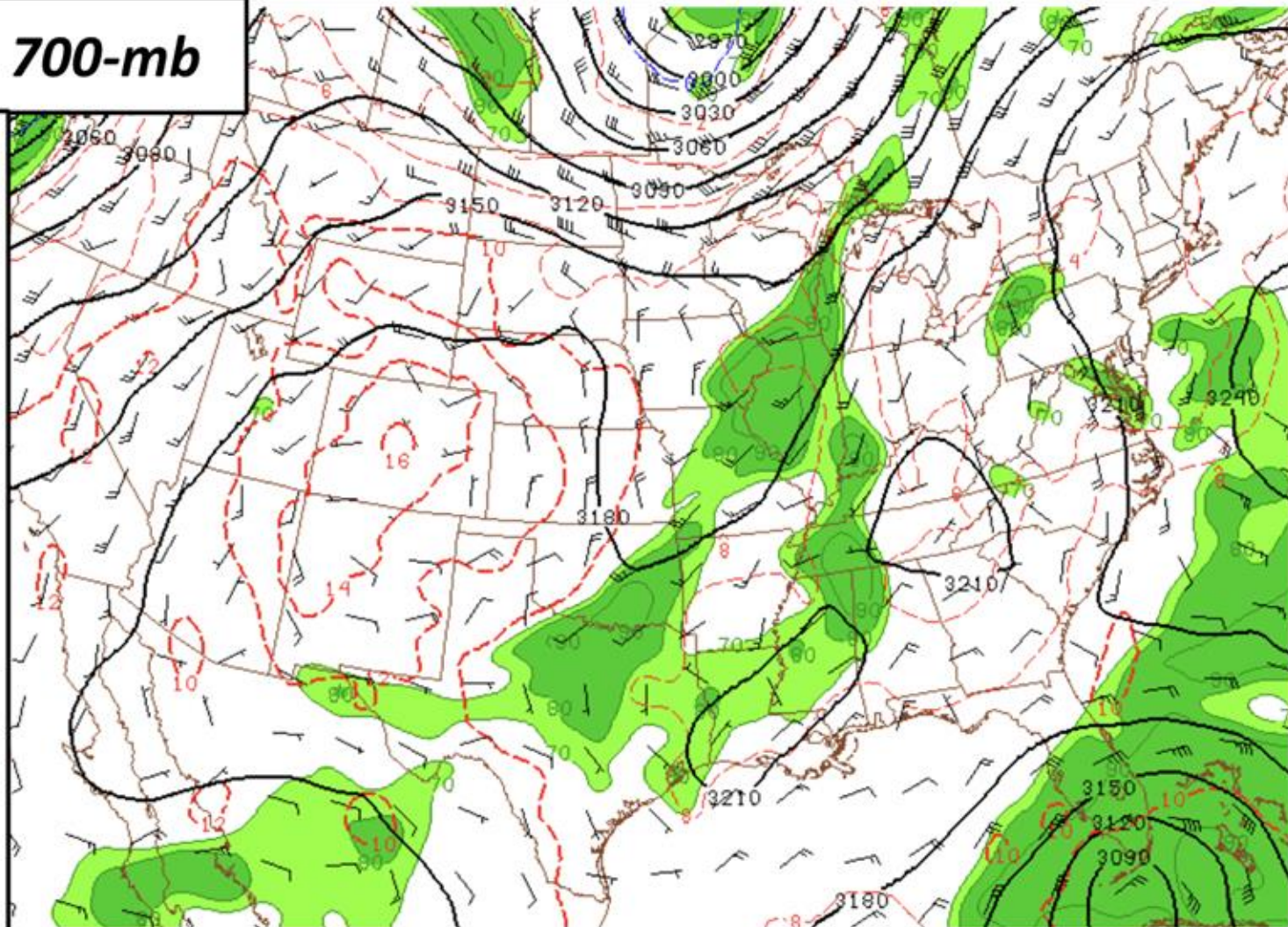
120826/1700 - 120826/0600 12hr 500mb height change and current hght, temp, and wind

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

700-mb

-Horizontal gradient in mid-level moisture is found over NW semicircle of cyclonic flow envelope

-Lack of baroclinic-related processes limits propensity for this dry air to cyclonically envelop the TC

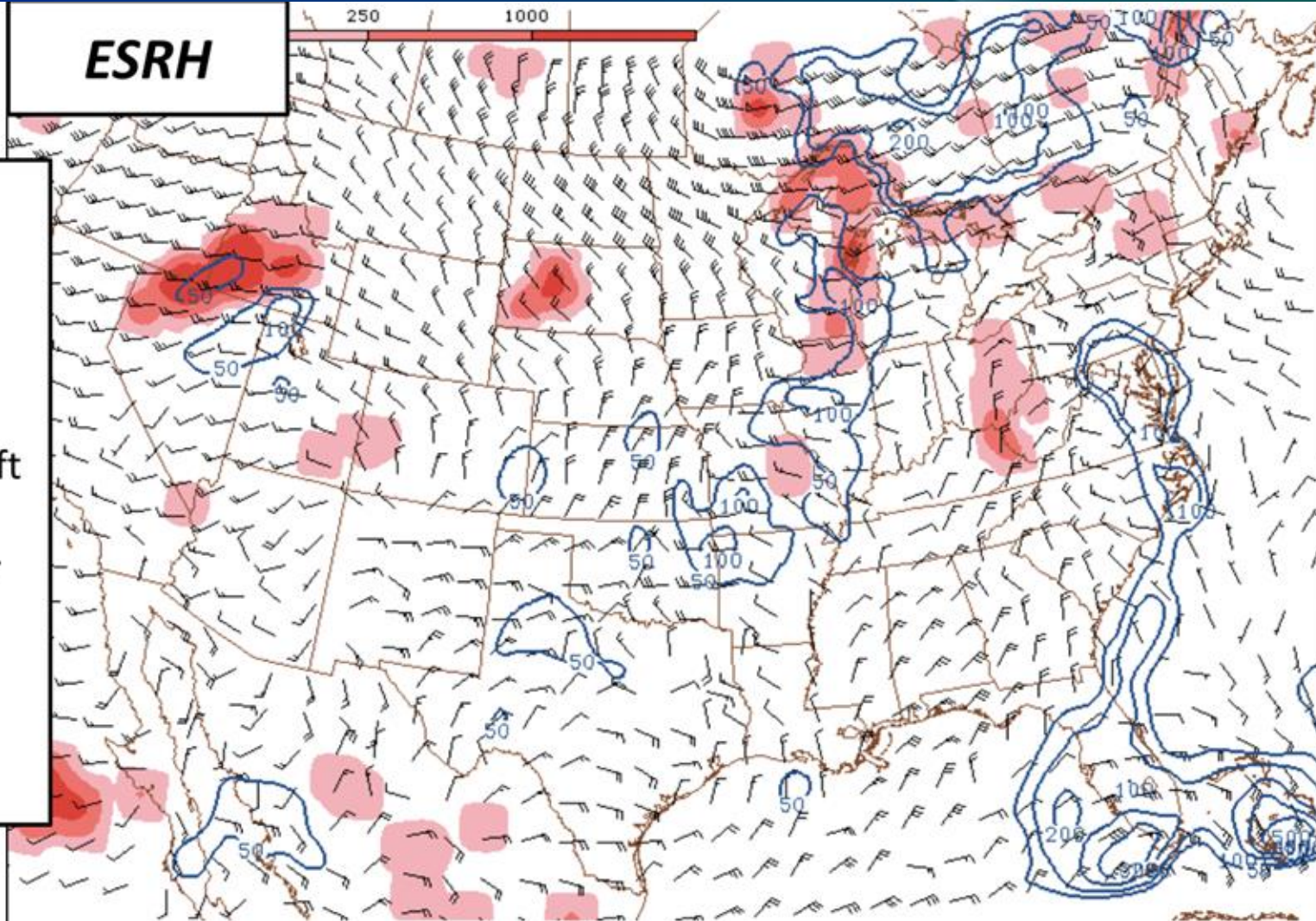


70 80 120826/1800V001 700mb hght/wind/temp/700-500mb mean RH (f111)

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

ESRH

-Favorable environmental storm-relative helicity -- supportive of immediate updraft rotation -- owing to ingestion of air following helical trajectories into updrafts

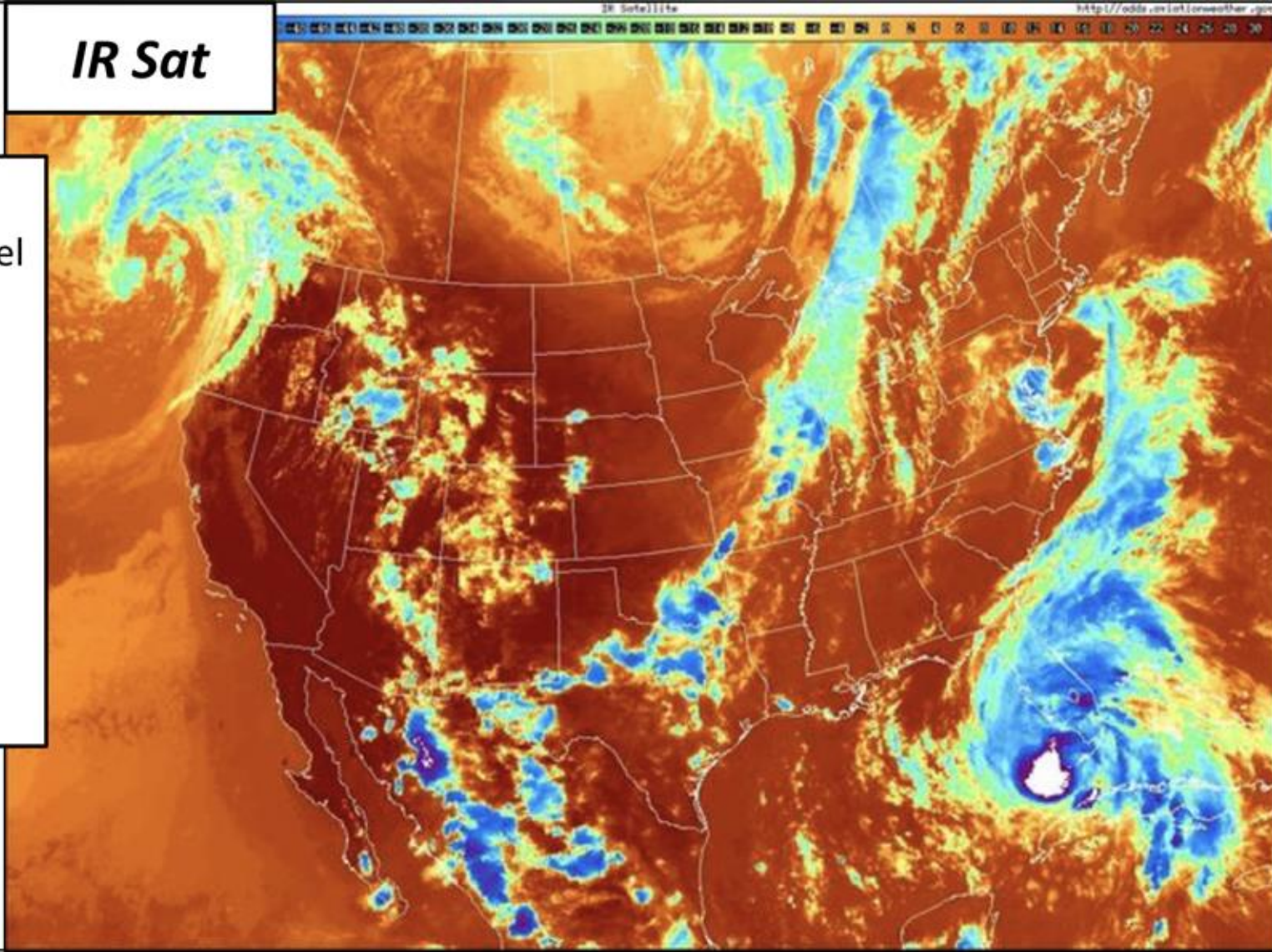


120826/1800 Eff. Inflow Base (fill, m AGL), ESRH (m²/s²) and storm motion (kt)

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

IR Sat

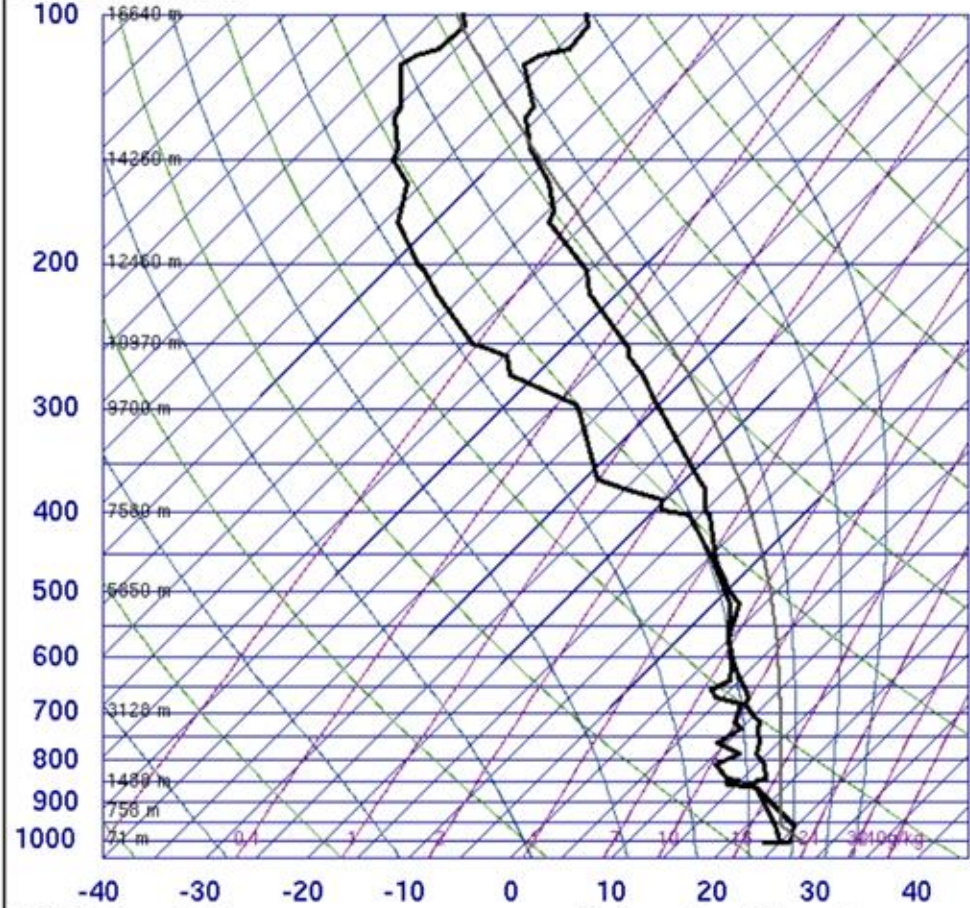
-No evidence of favorable mid-level dry air intrusions into the TC -- resulting in a generally unfavorable mesoscale environment for tornadogenesis



TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

-Moist-adiabatic lapse rate environment with accompanying weak mid-level lapse rates -- no evidence of mid-level dry air intrusion into the moisture-rich TC environment

72202 MFL Miami

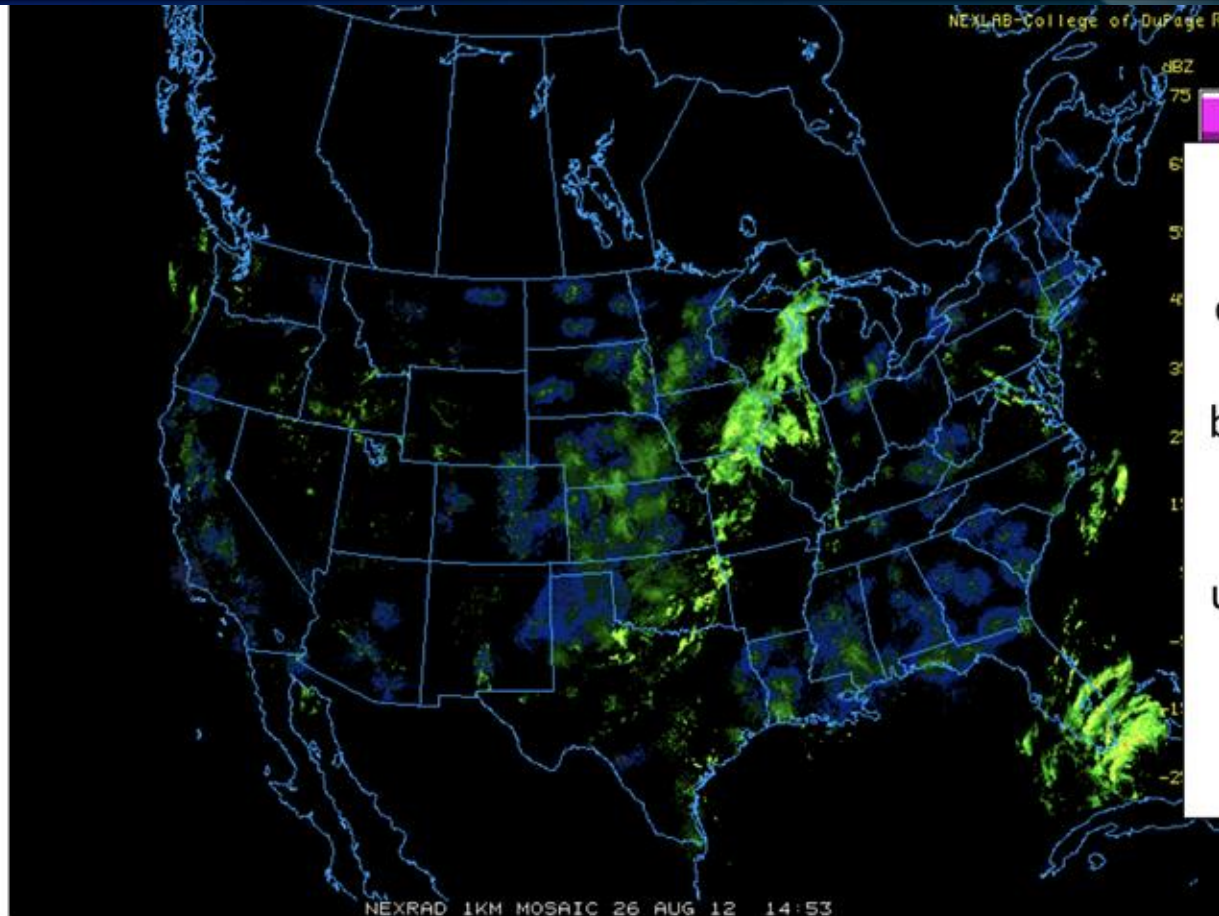


SLAT	25.75
SLON	-80.38
SELV	5.00
SHOW	2.58
LIFT	-3.86
LFTV	-4.21
SWET	303.0
KINX	33.90
CTOT	18.50
VTOT	21.30
TOTL	39.80
CAPE	1676.
CAPV	2034.
CINS	-4.37
CINV	-3.03
EQLV	142.1
EQTV	142.0
LFCT	924.9
LFCV	930.6
BRCH	42.72
BRCV	46.27
LCLT	296.6
LCLP	960.2
LCLE	357.1
MLTH	300.1
MLMR	19.41
THCK	5779.
PWAT	64.05

12Z 26 Aug 2012

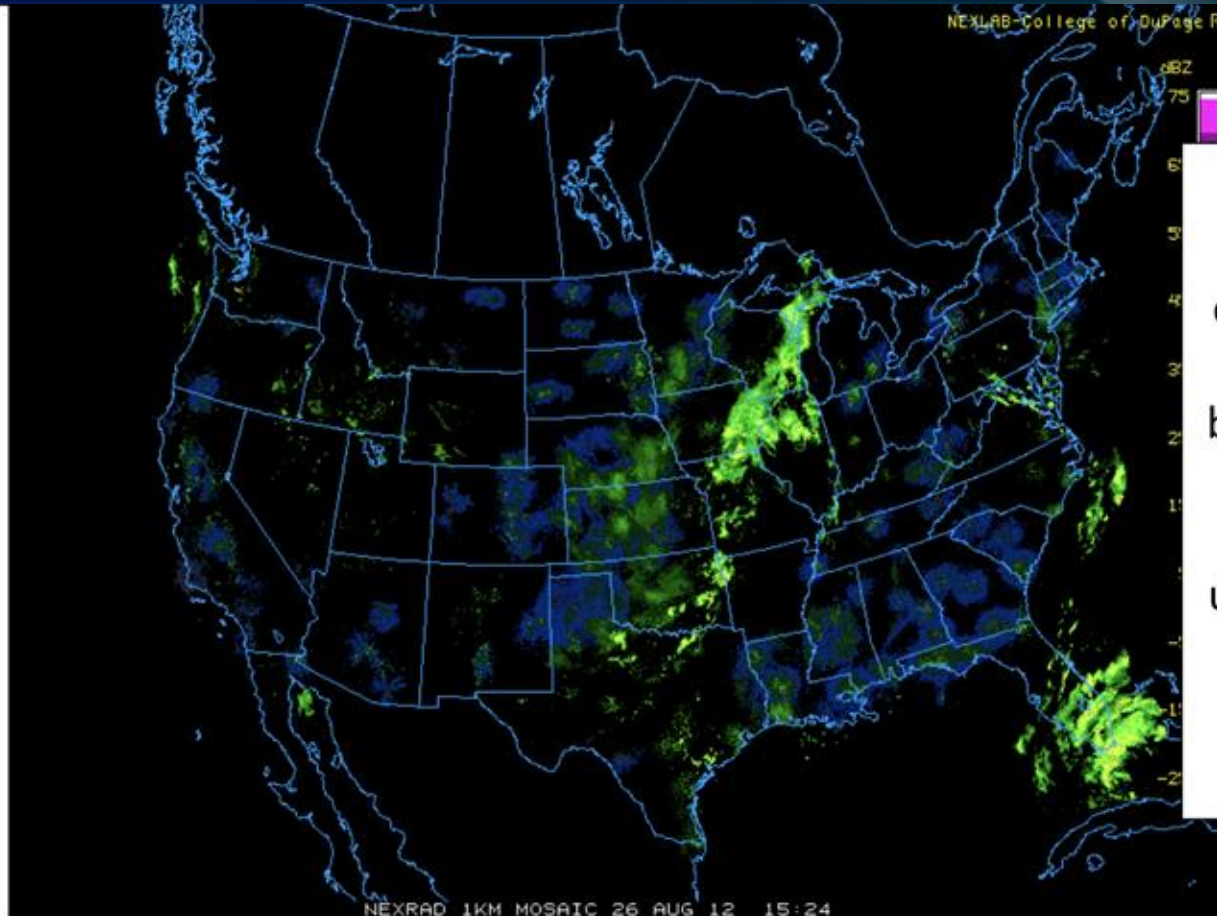
University of Wyoming

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



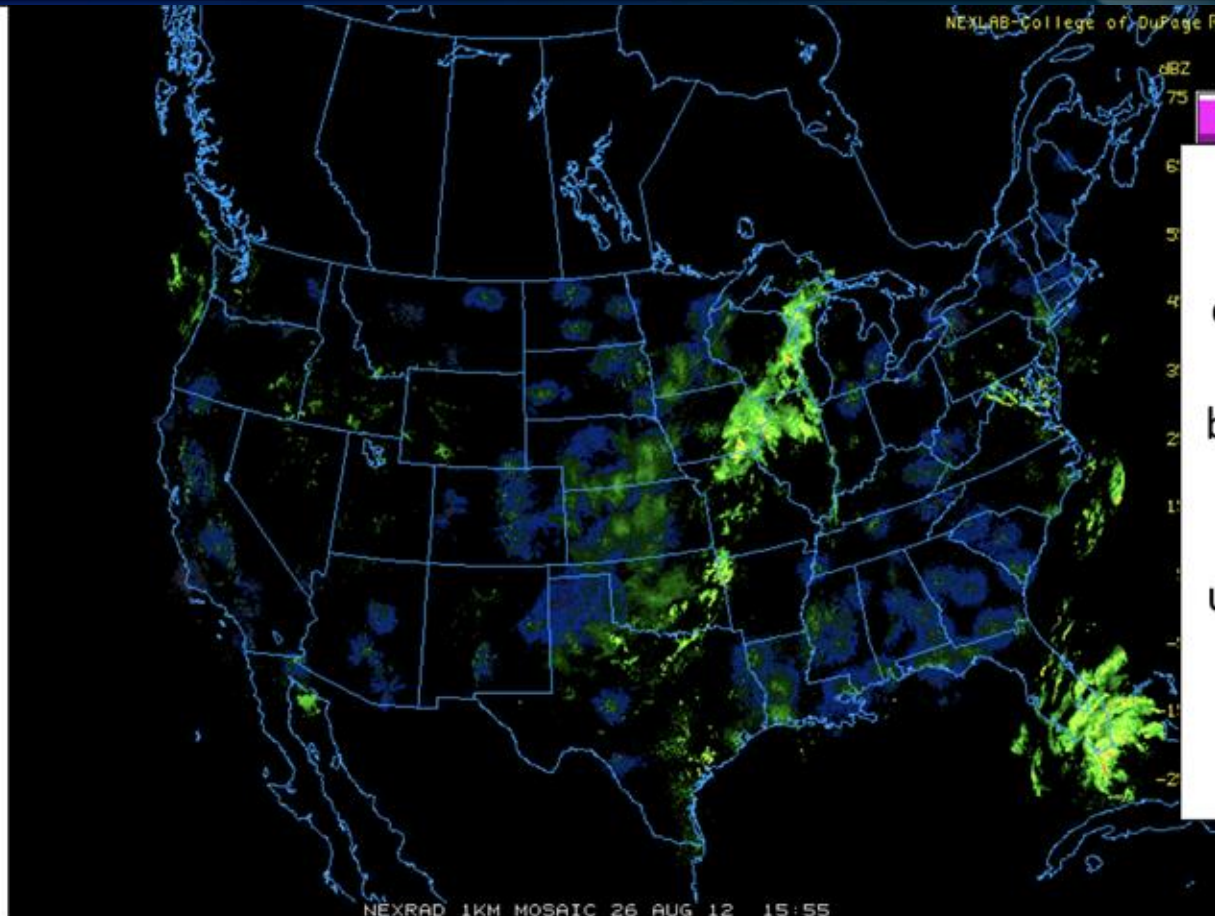
Large blob of continuous convection made it difficult for boundary layer to recover -- very little room for updrafts to ingest potent air supportive of tornadogenesis

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



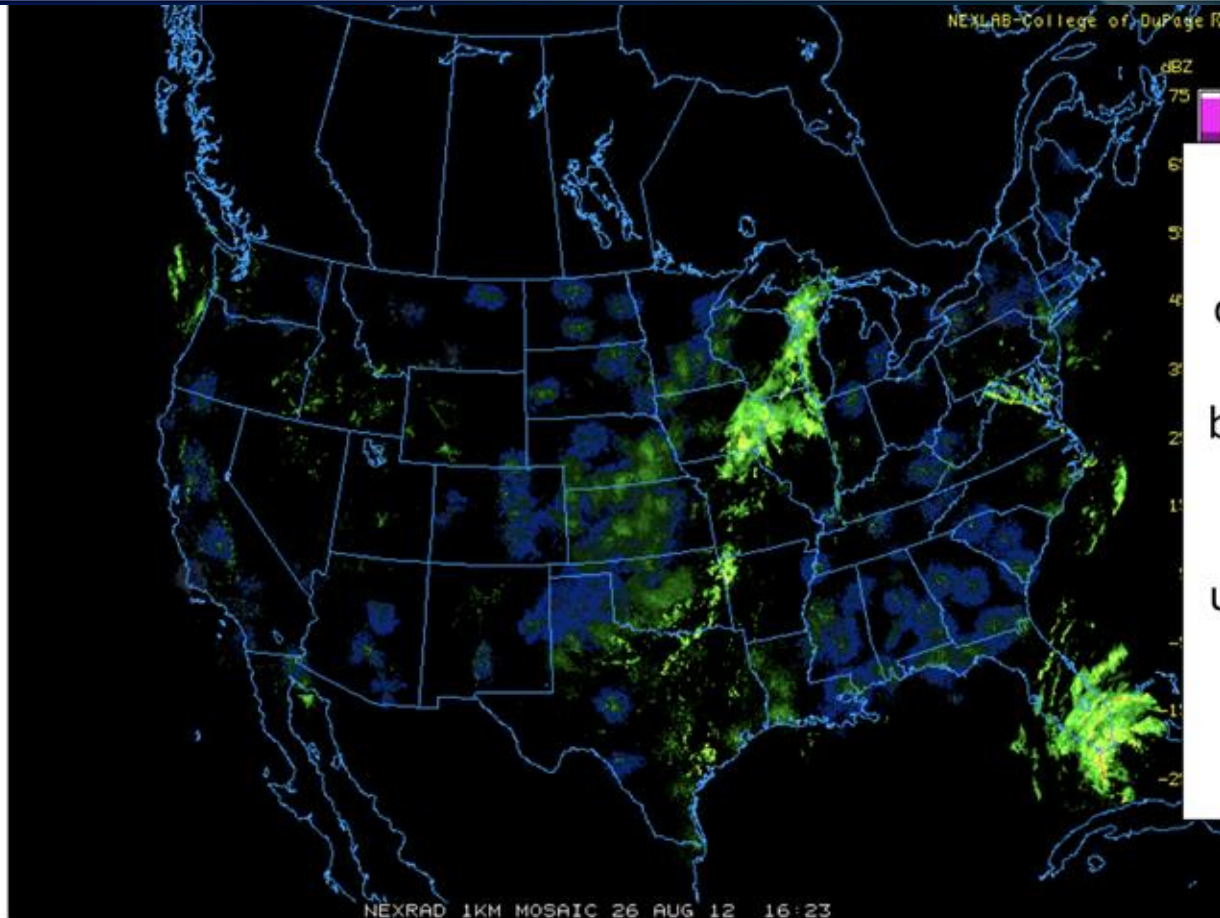
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TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



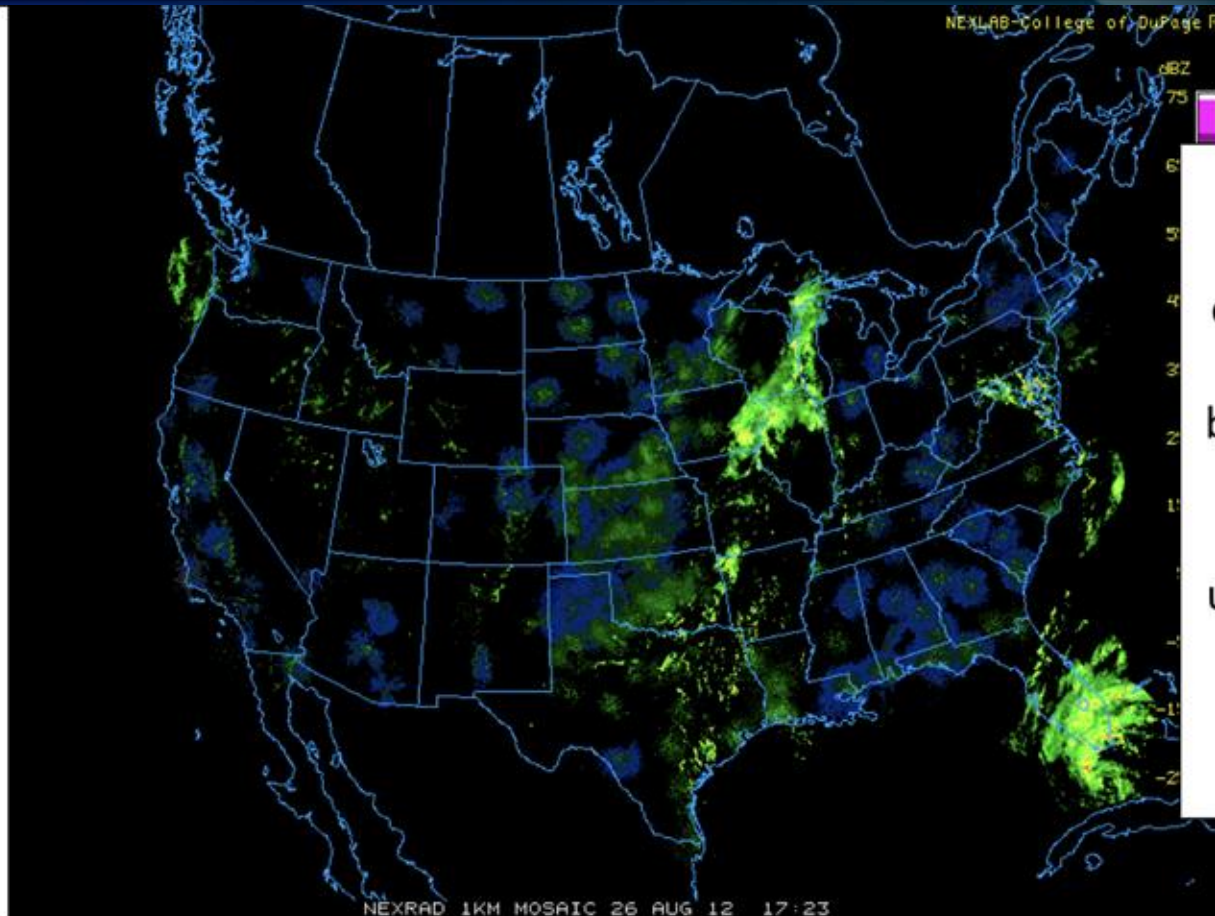
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TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



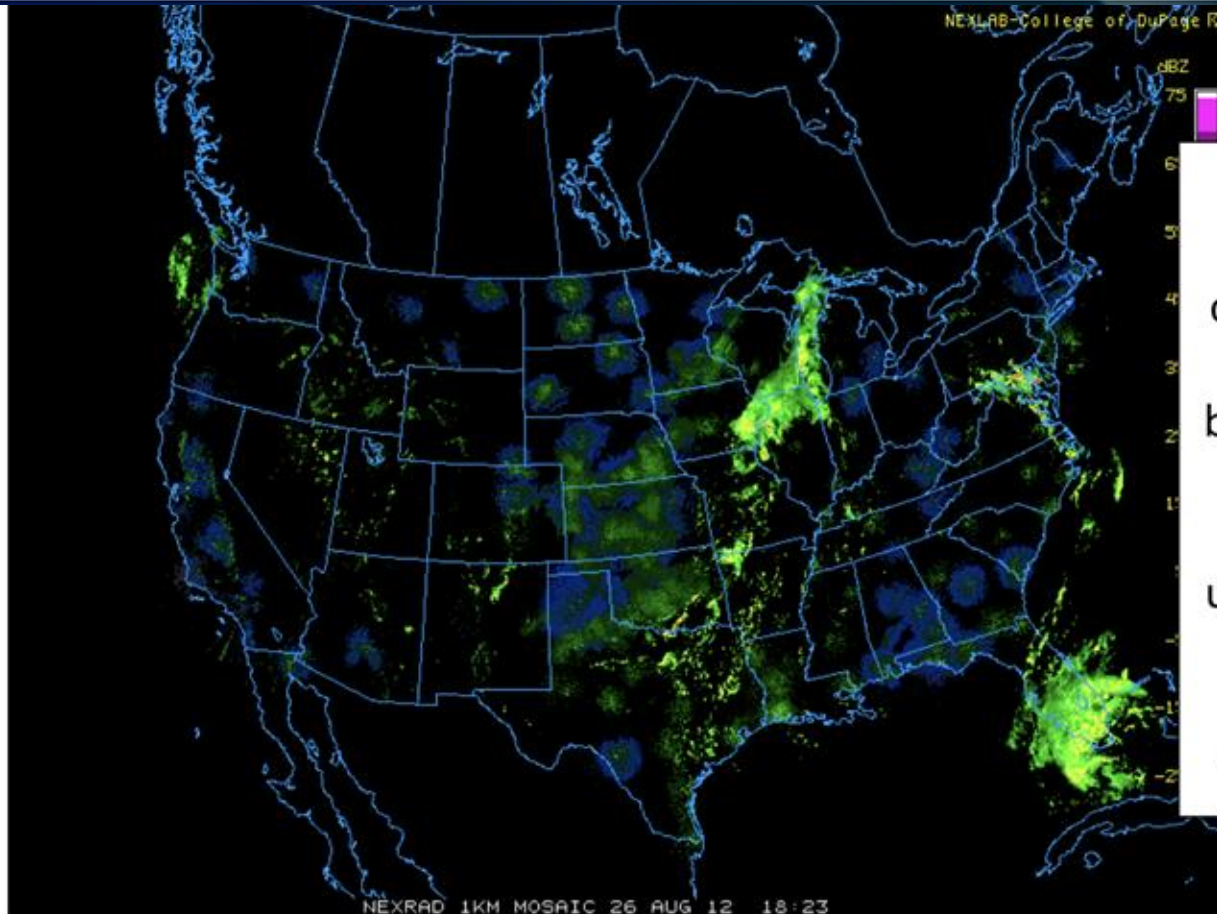
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TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)



Large blob of continuous convection made it difficult for boundary layer to recover -- very little room for updrafts to ingest potent air supportive of tornadogenesis

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

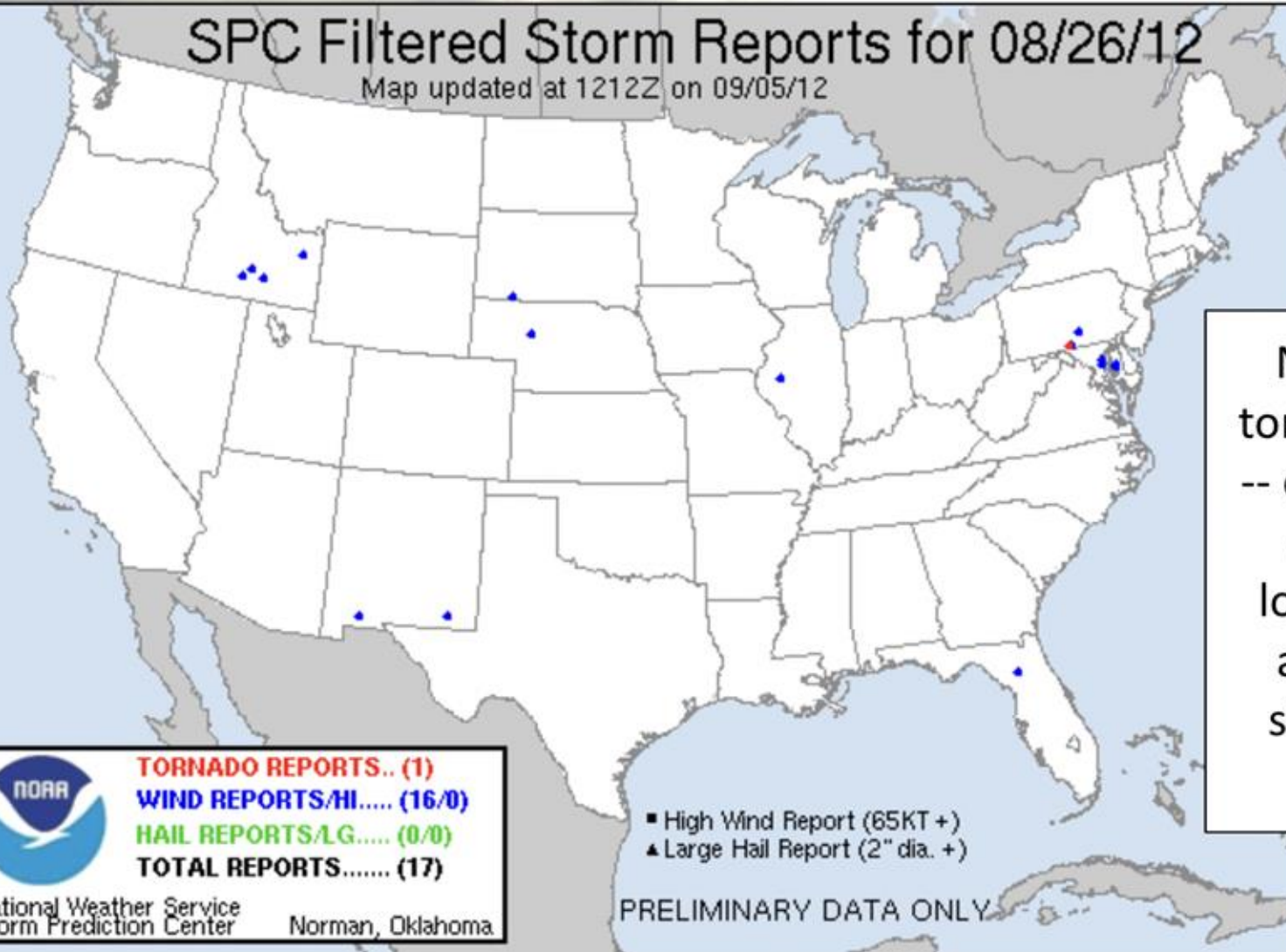


Large blob of continuous convection made it difficult for boundary layer to recover -- very little room for updrafts to ingest potent air supportive of tornadogenesis

TC TORNADO EXAMPLE CASES 2 (ISAAC 2012)

SPC Filtered Storm Reports for 08/26/12

Map updated at 1212Z on 09/05/12



No reports of tornadoes in S FL -- even with tons of favorable low-level shear and resultant storm-relative helicity

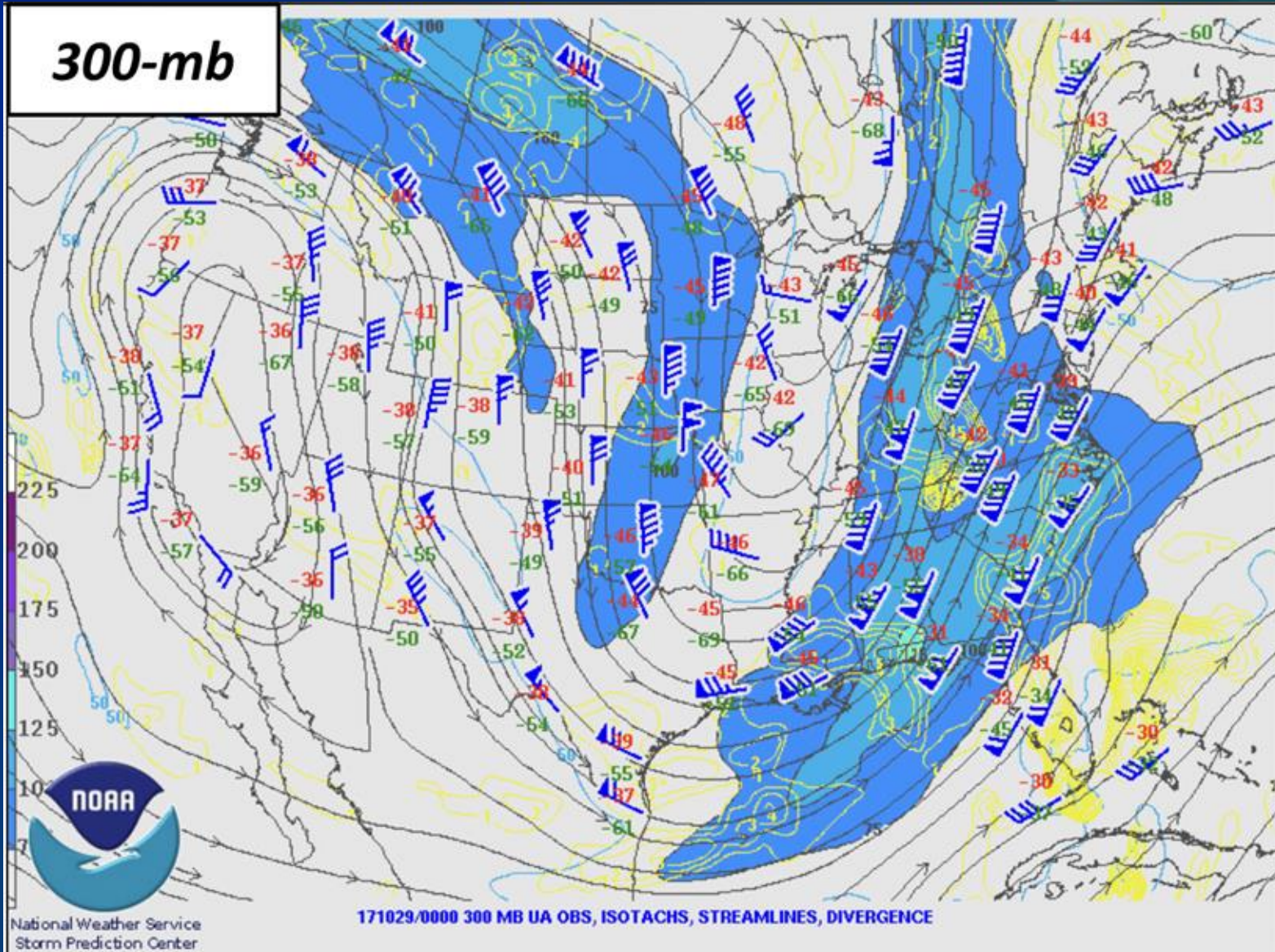


National Weather Service
Storm Prediction Center
Norman, Oklahoma

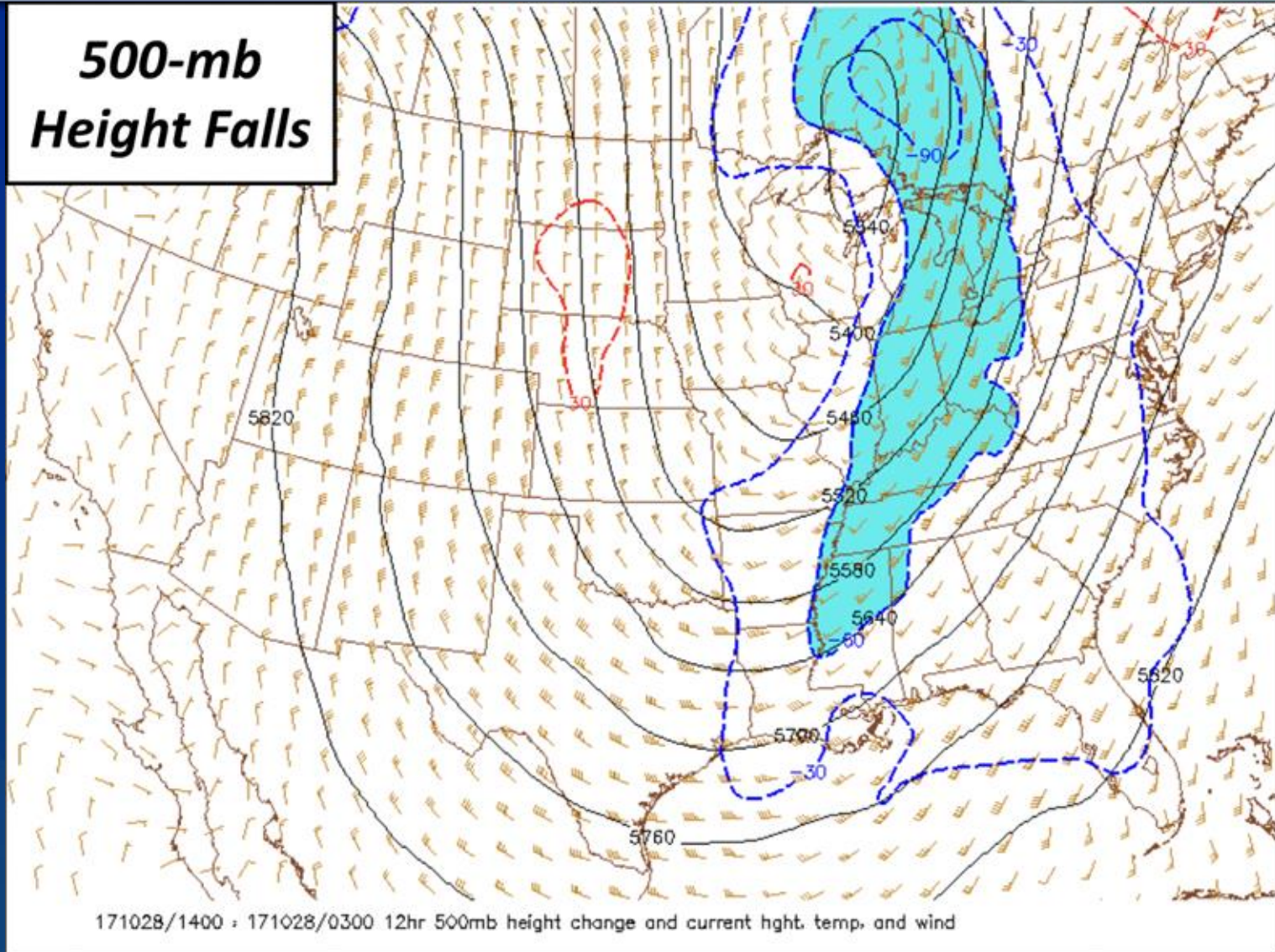
***TC TORNADO EXAMPLE CASES 3
(NOW YOU TRY!)***

Now you try! Does Case 3 depict a favorable or unfavorable synoptic environment for TC tornadoes?

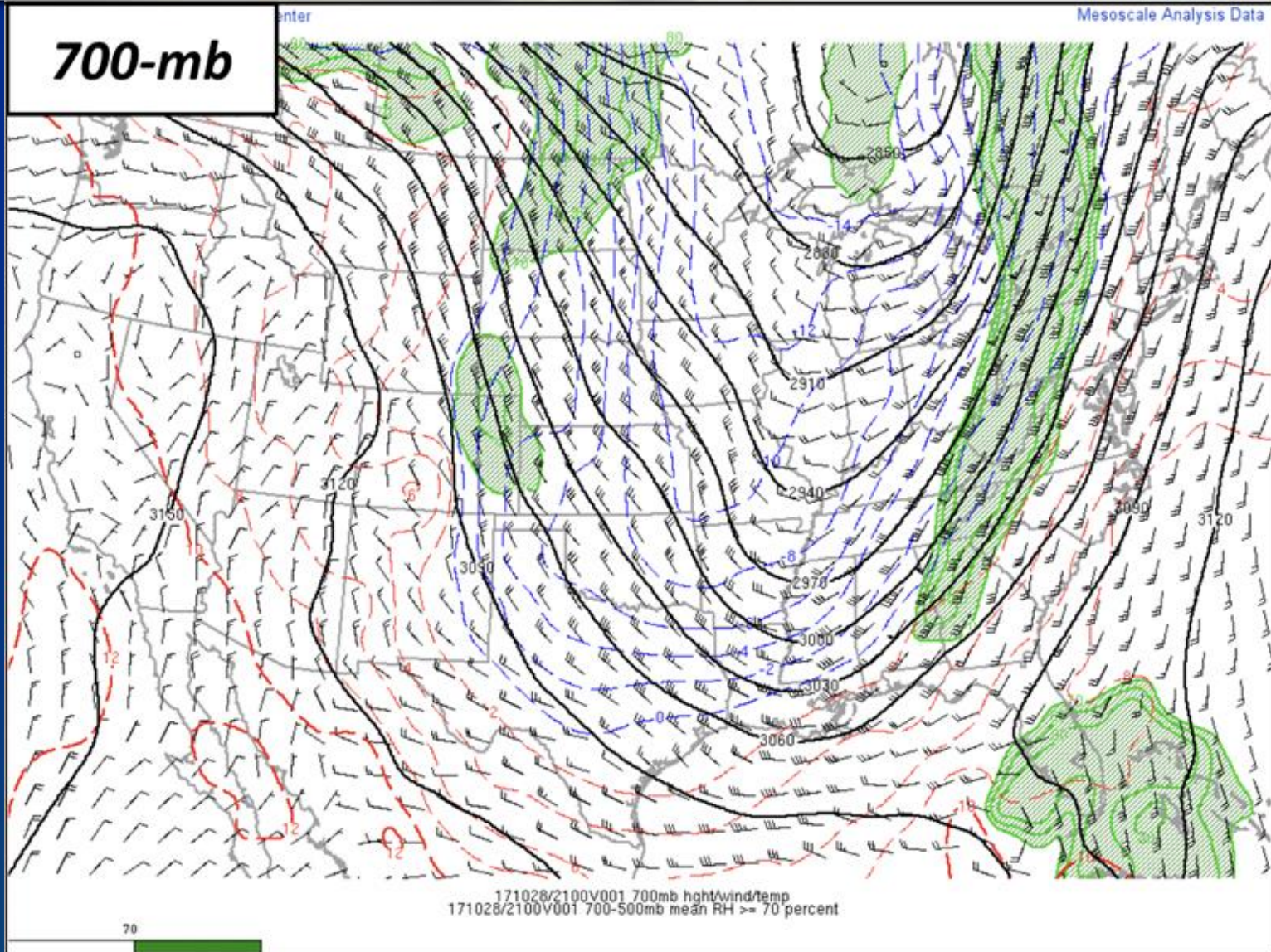
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



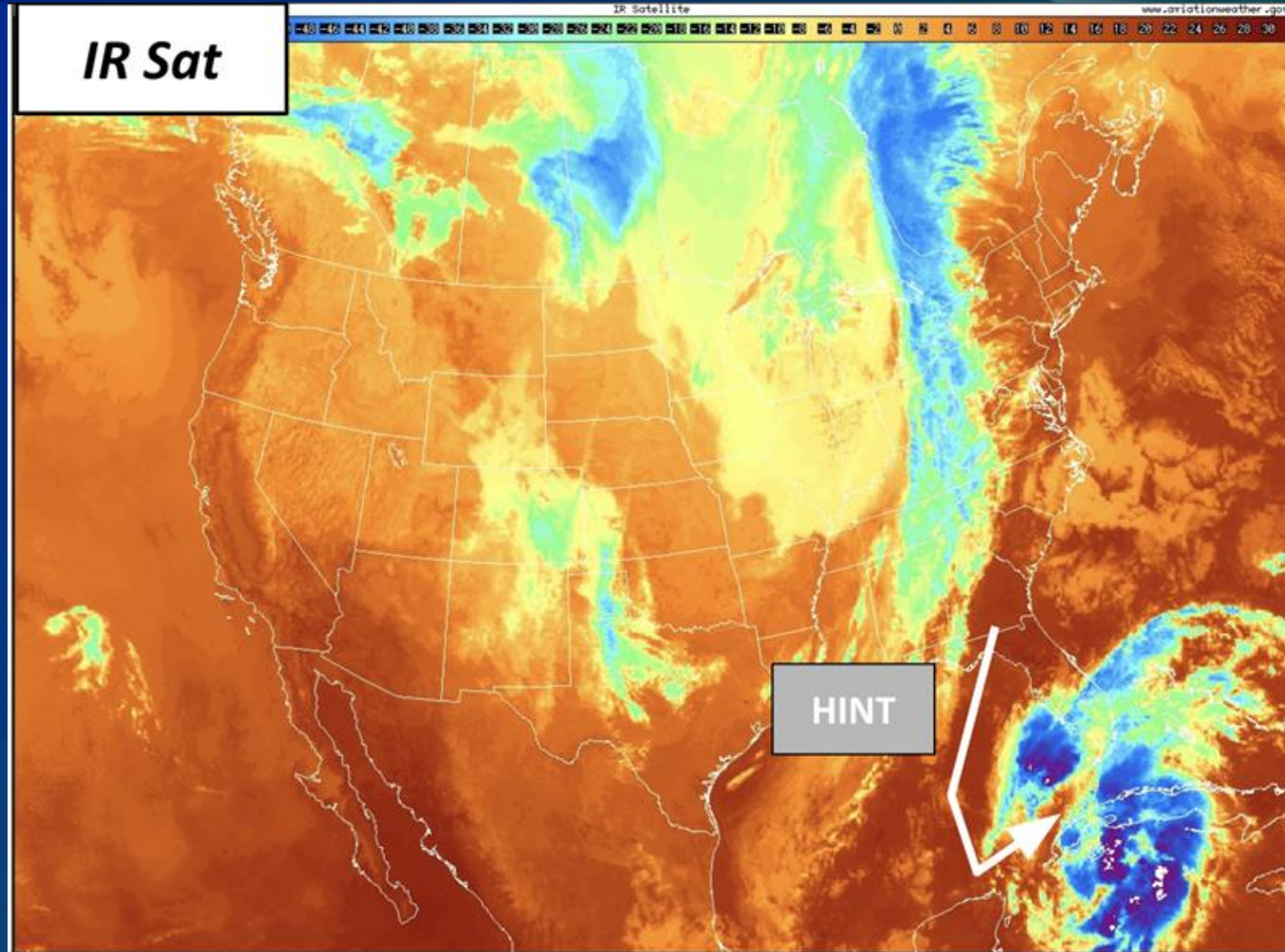
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



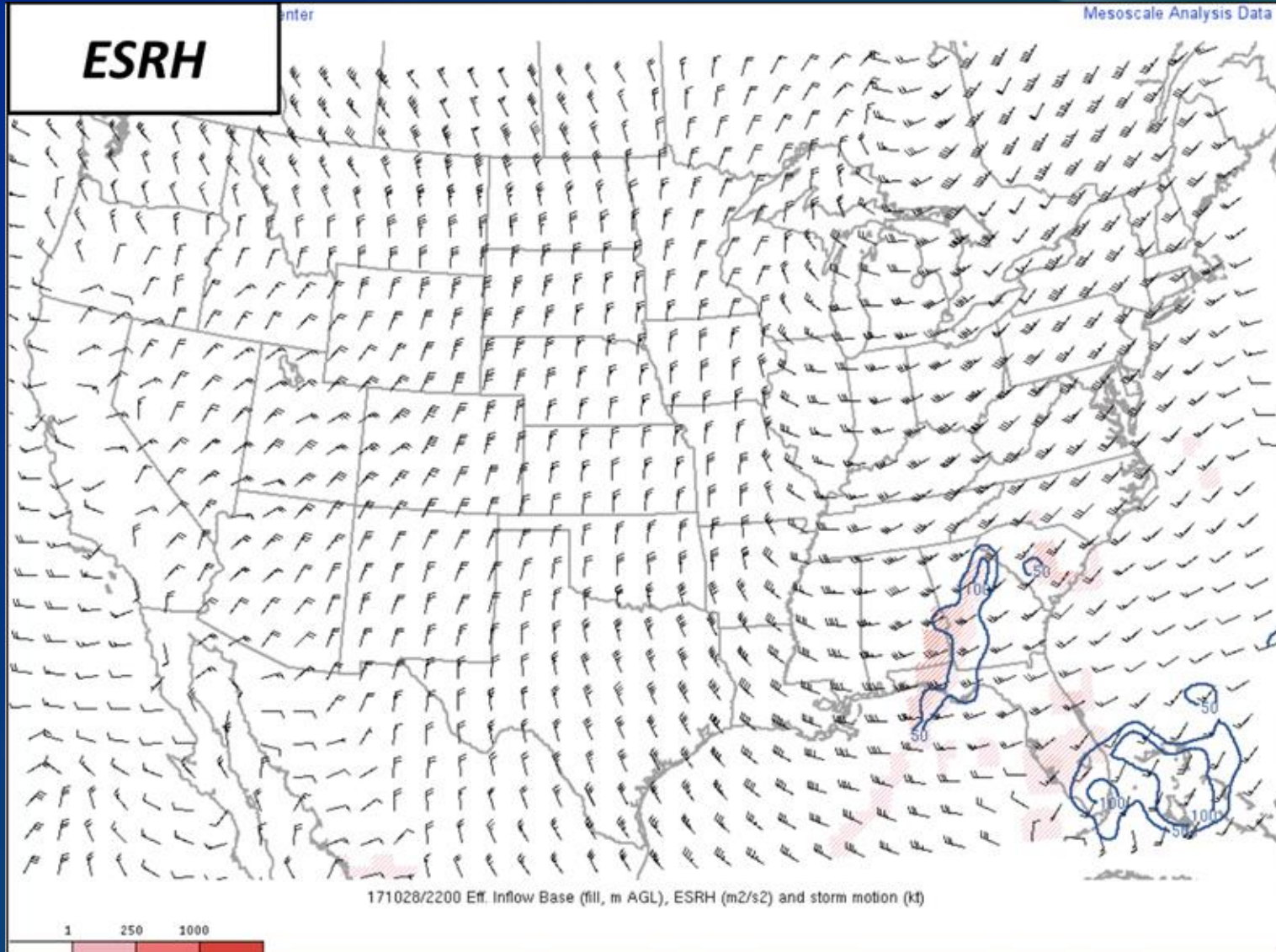
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



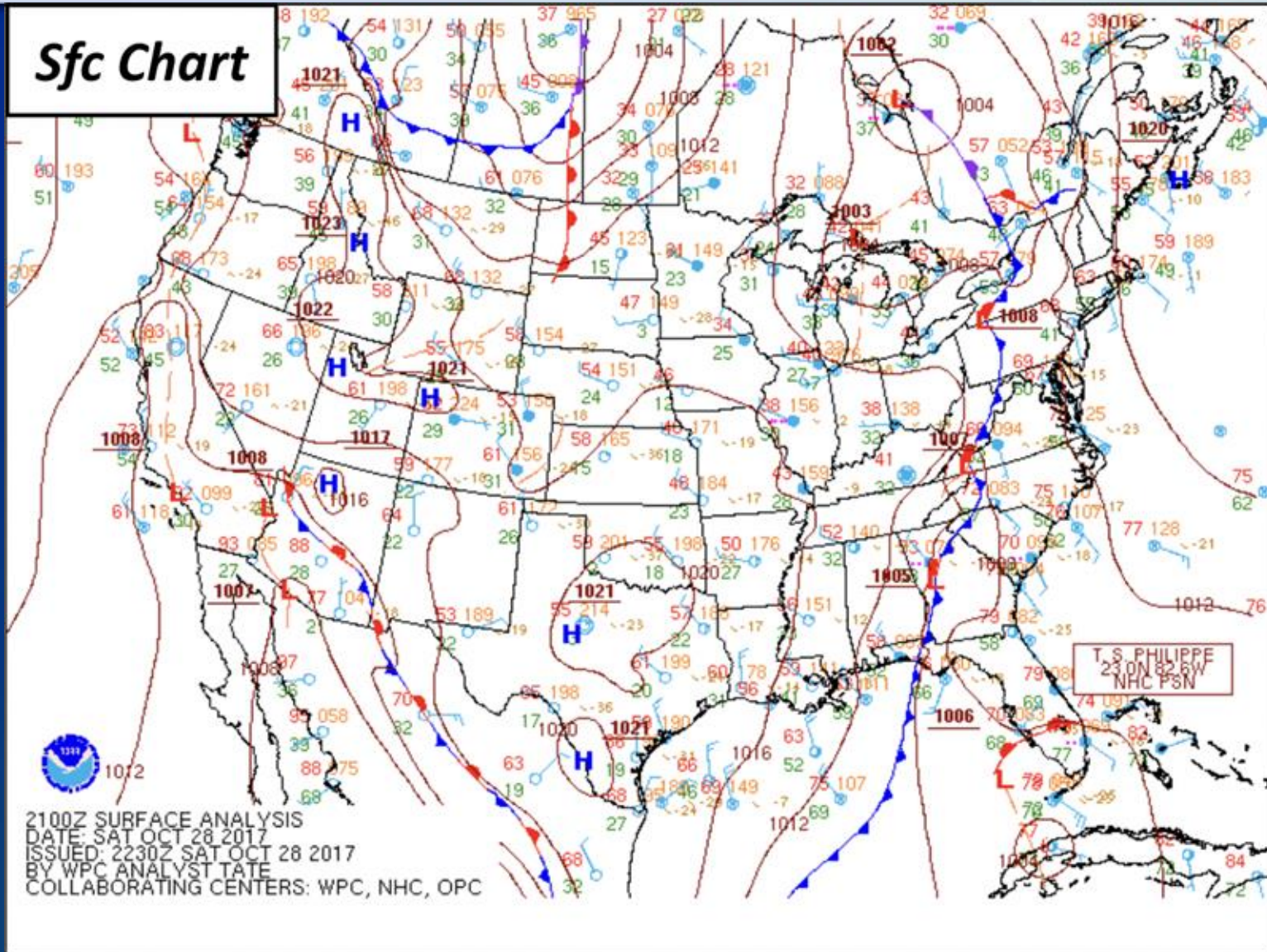
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



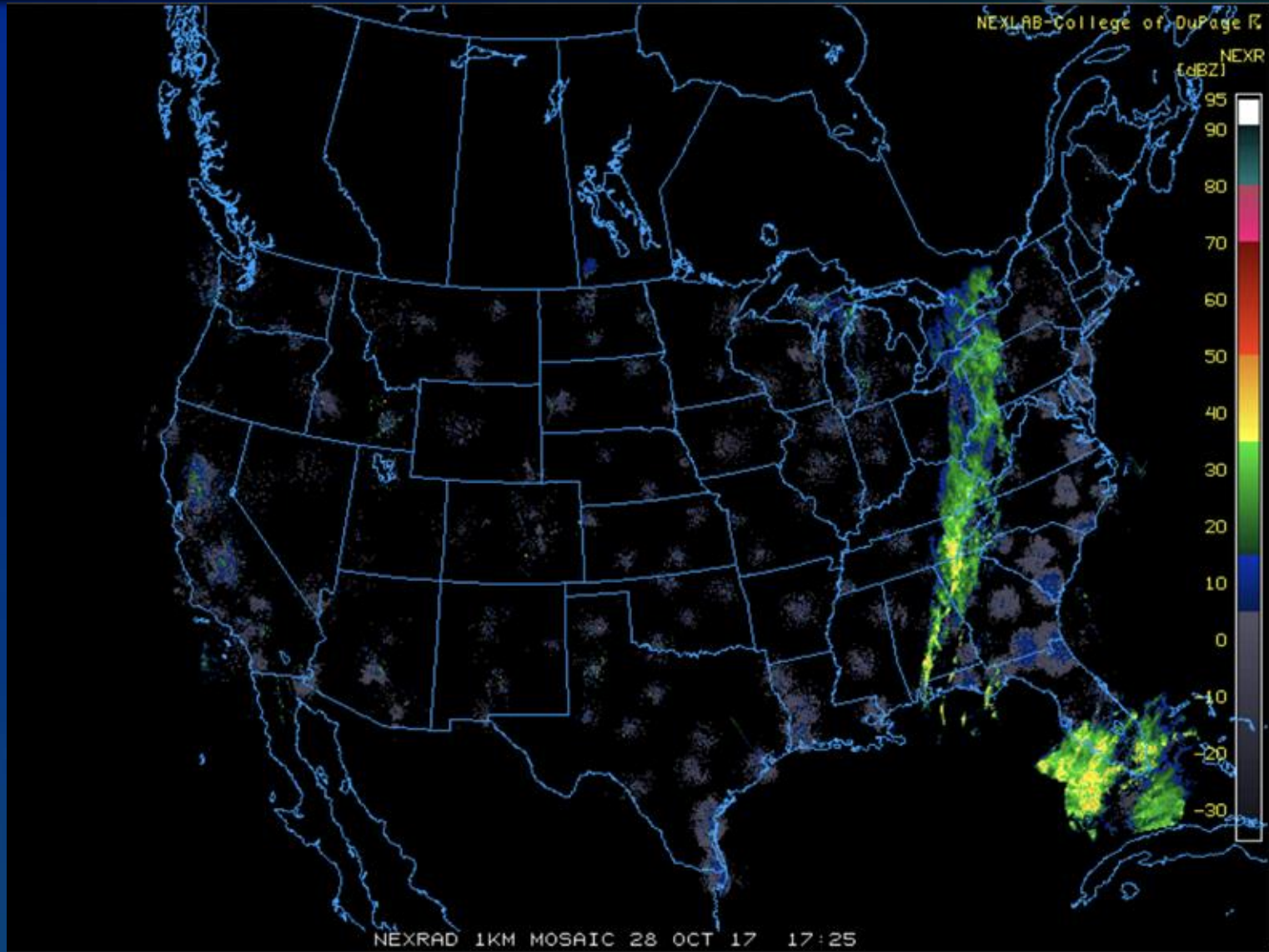
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



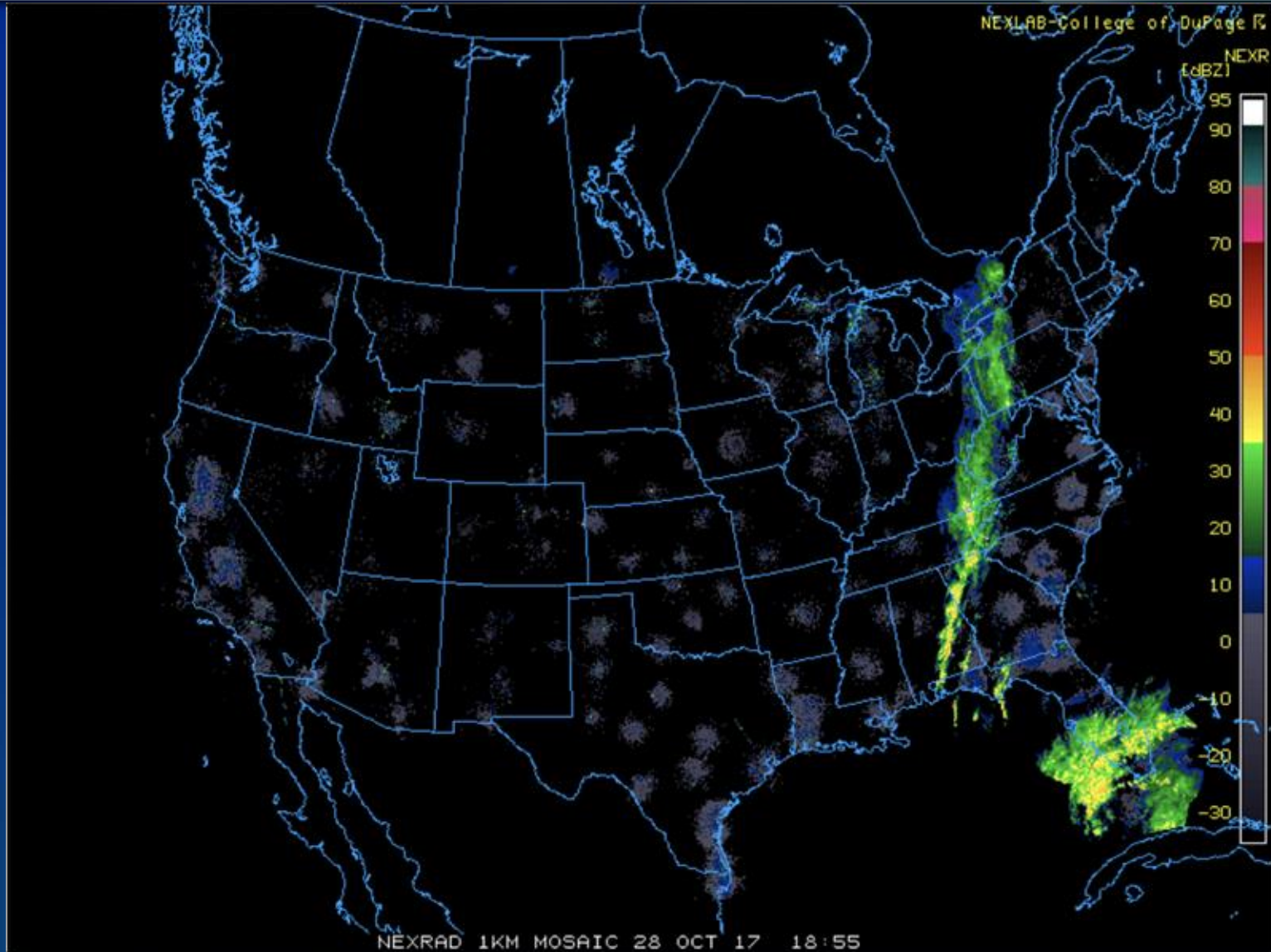
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



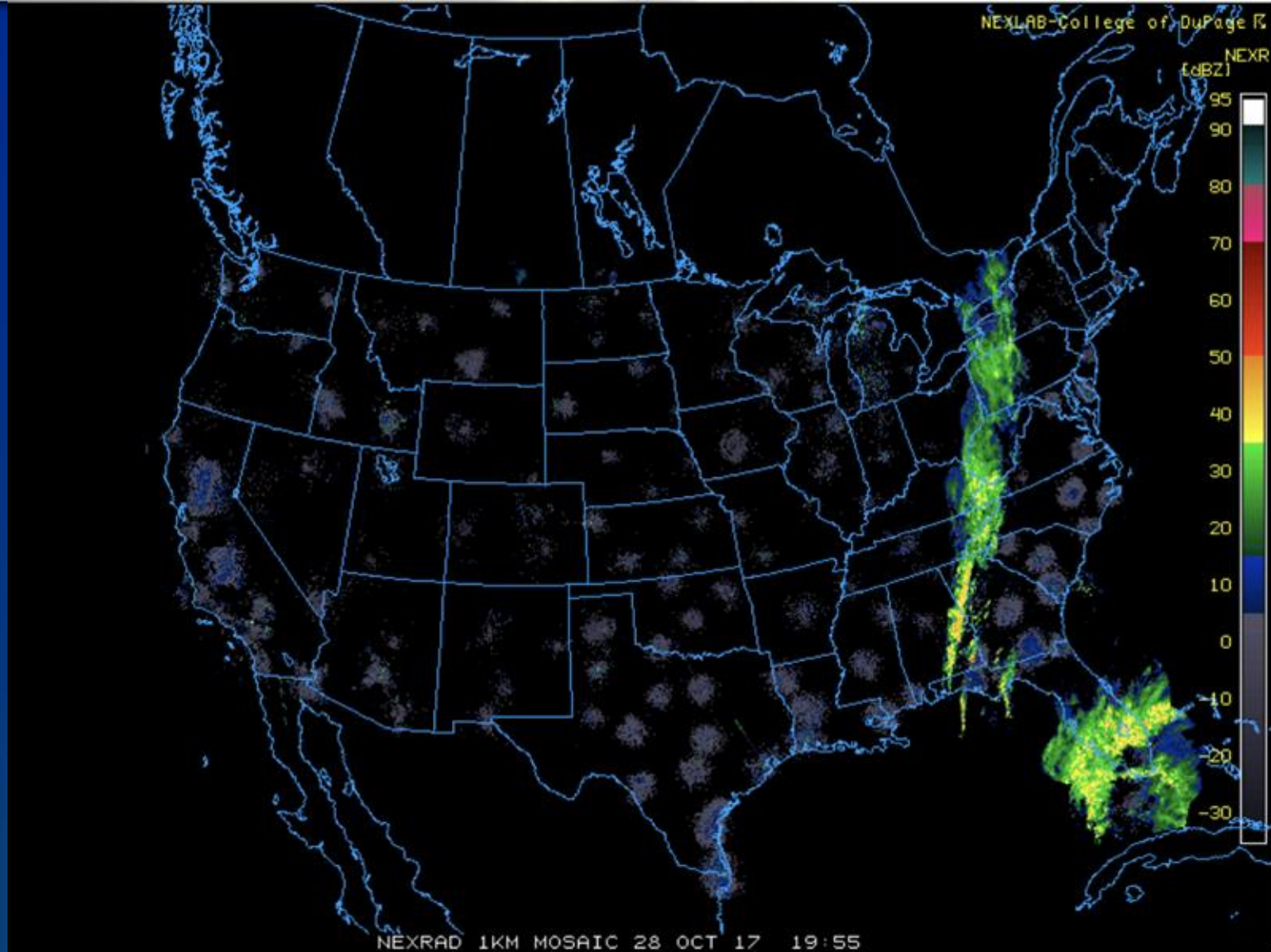
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



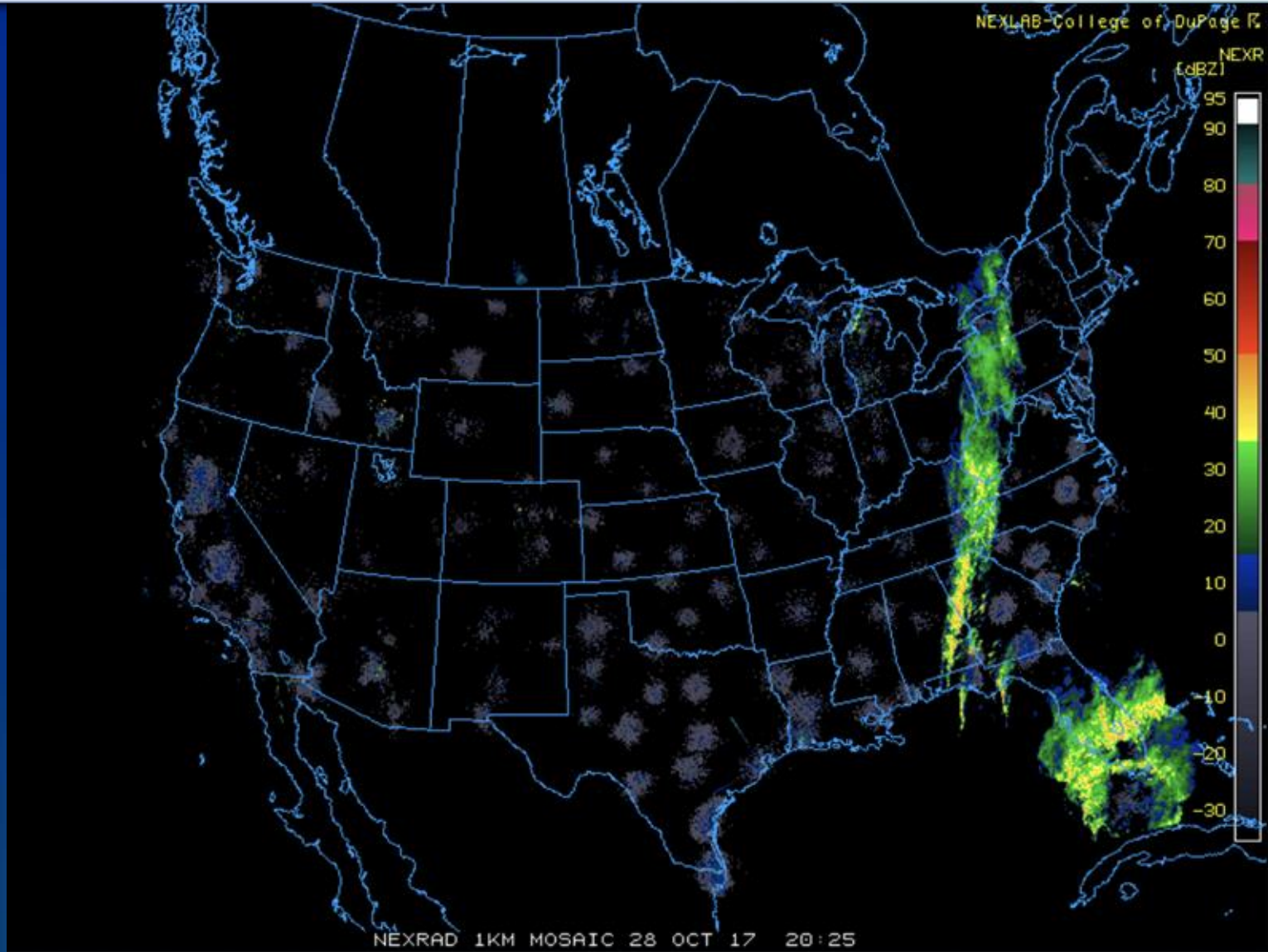
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



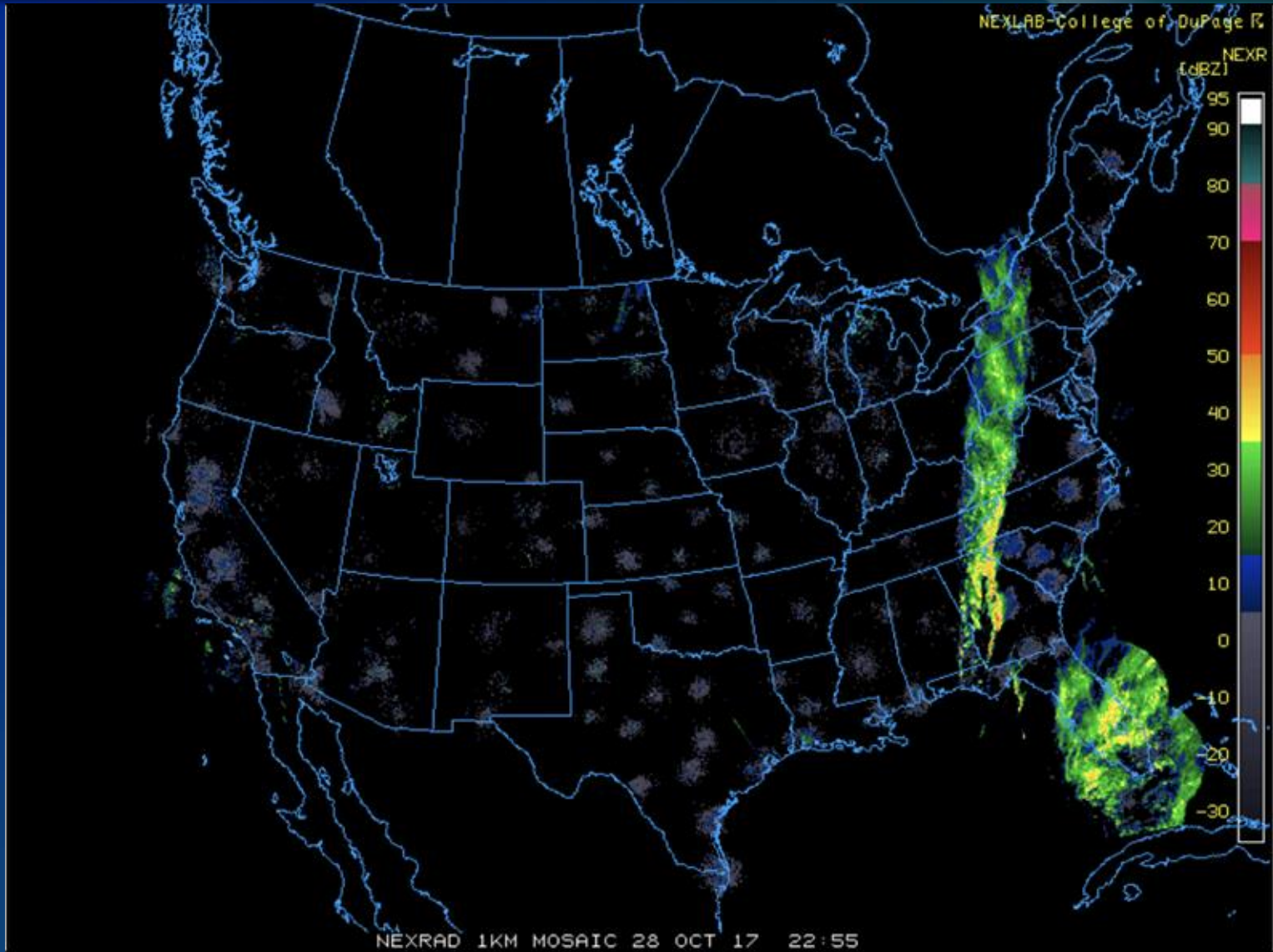
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



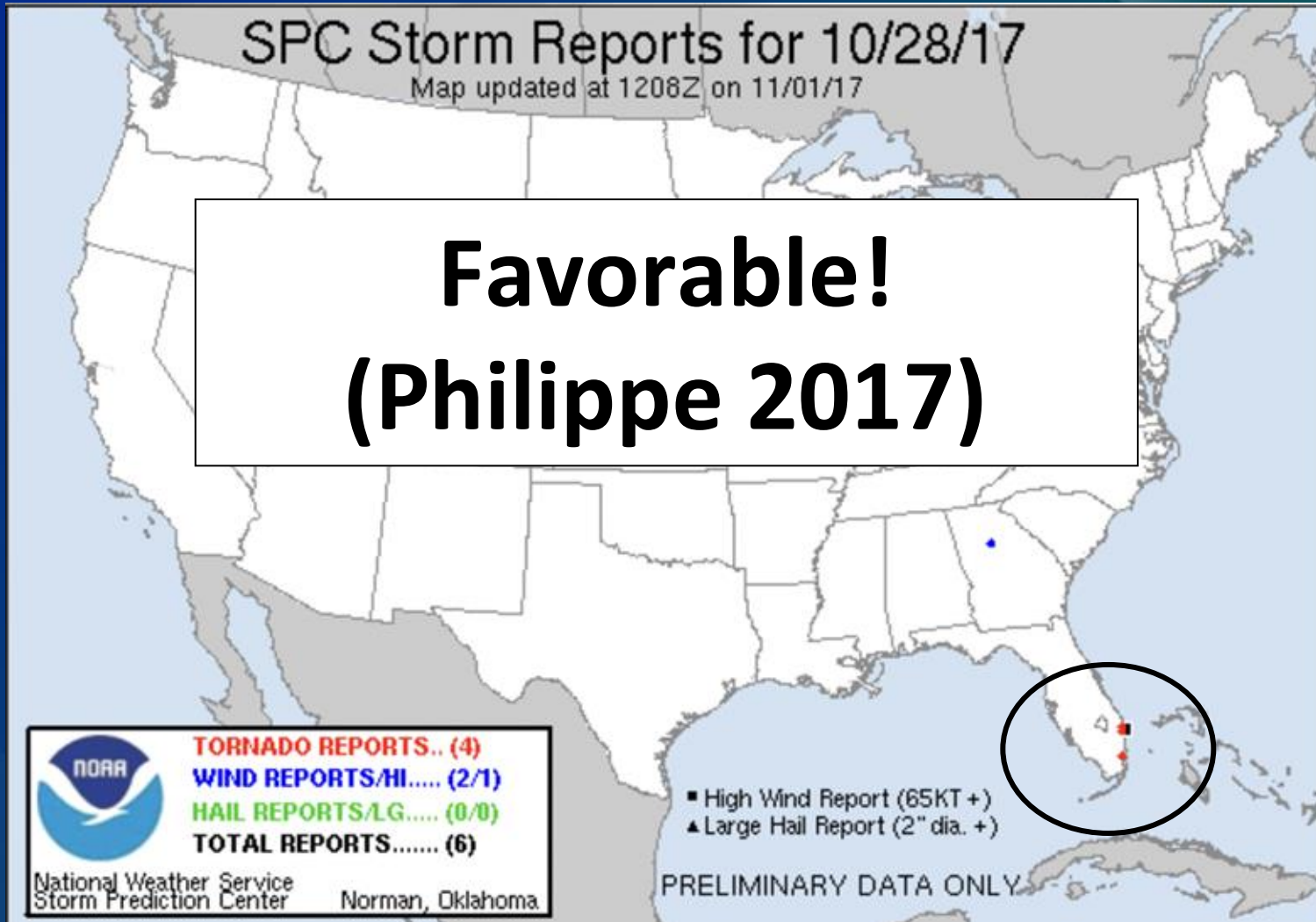
TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



TC TORNADO EXAMPLE CASES 3 (FAVORABLE OR UNFAVORABLE?)



The background of the slide is a tropical beach scene. In the foreground, there are several palm trees on a sandy beach. The ocean is visible in the middle ground, and the sky is dark and stormy, with bright green lightning bolts striking down. The entire scene is framed within a semi-circular shape that is part of a larger circular graphic.

DATABASE and DOCUMENTATION ONLINE:

www.spc.noaa.gov/publications

**Contact: Roger.Edwards@noaa.gov
Harry.Weinman@noaa.gov**