

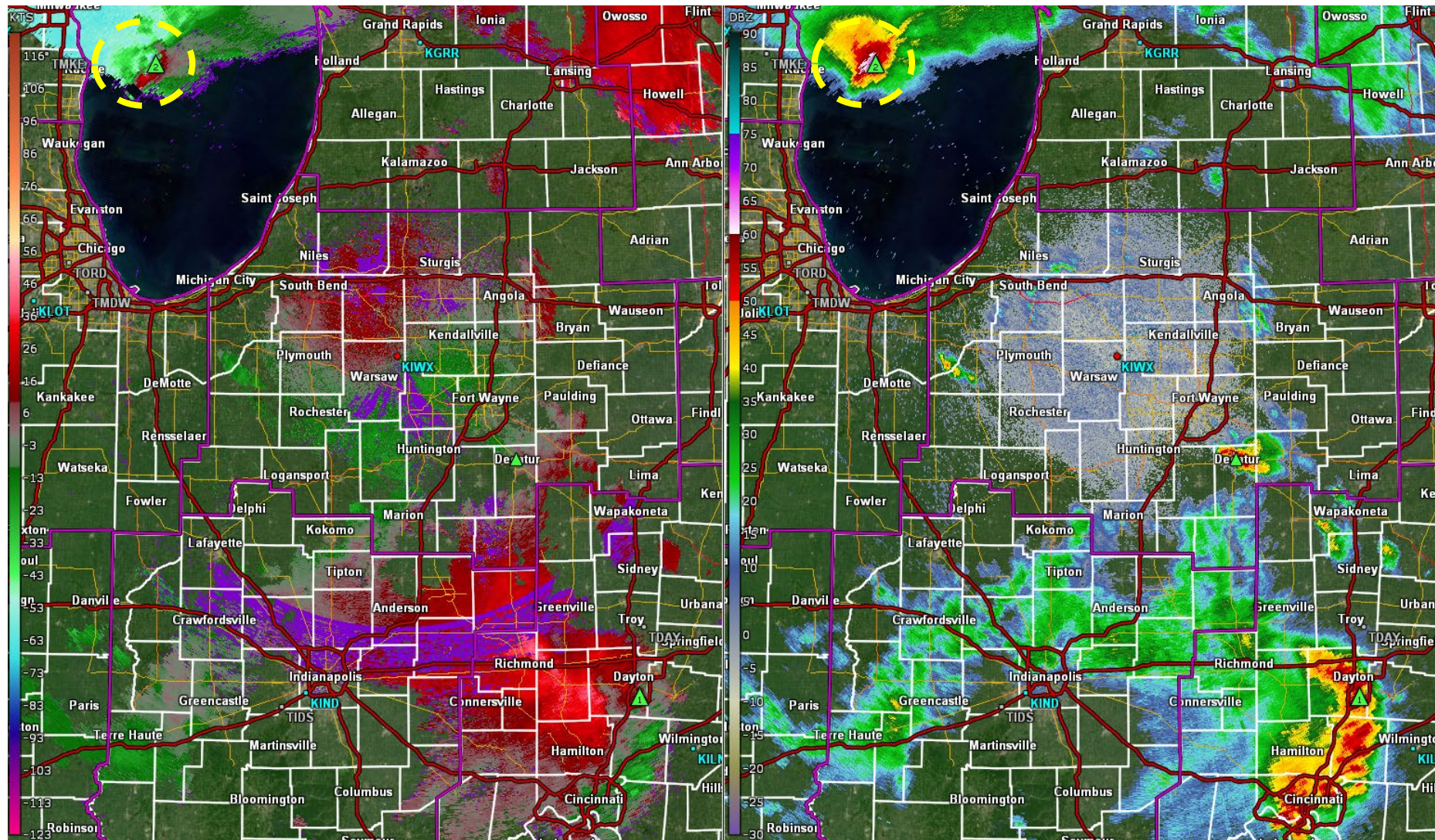


June 13 2022

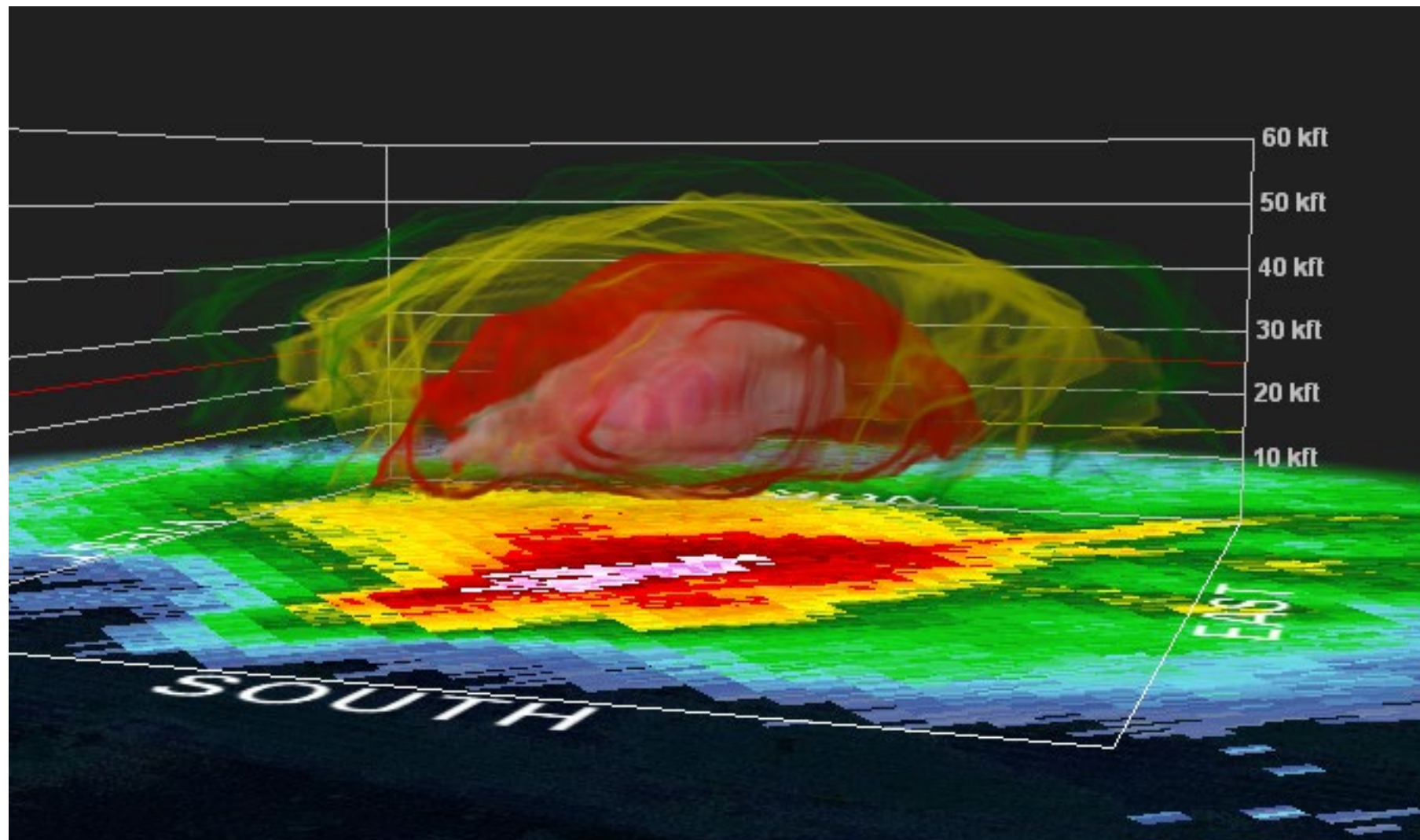
Precursors to an extreme wind event

Todd Holsten and Jeff Logsdon, National Weather Service Northern Indiana

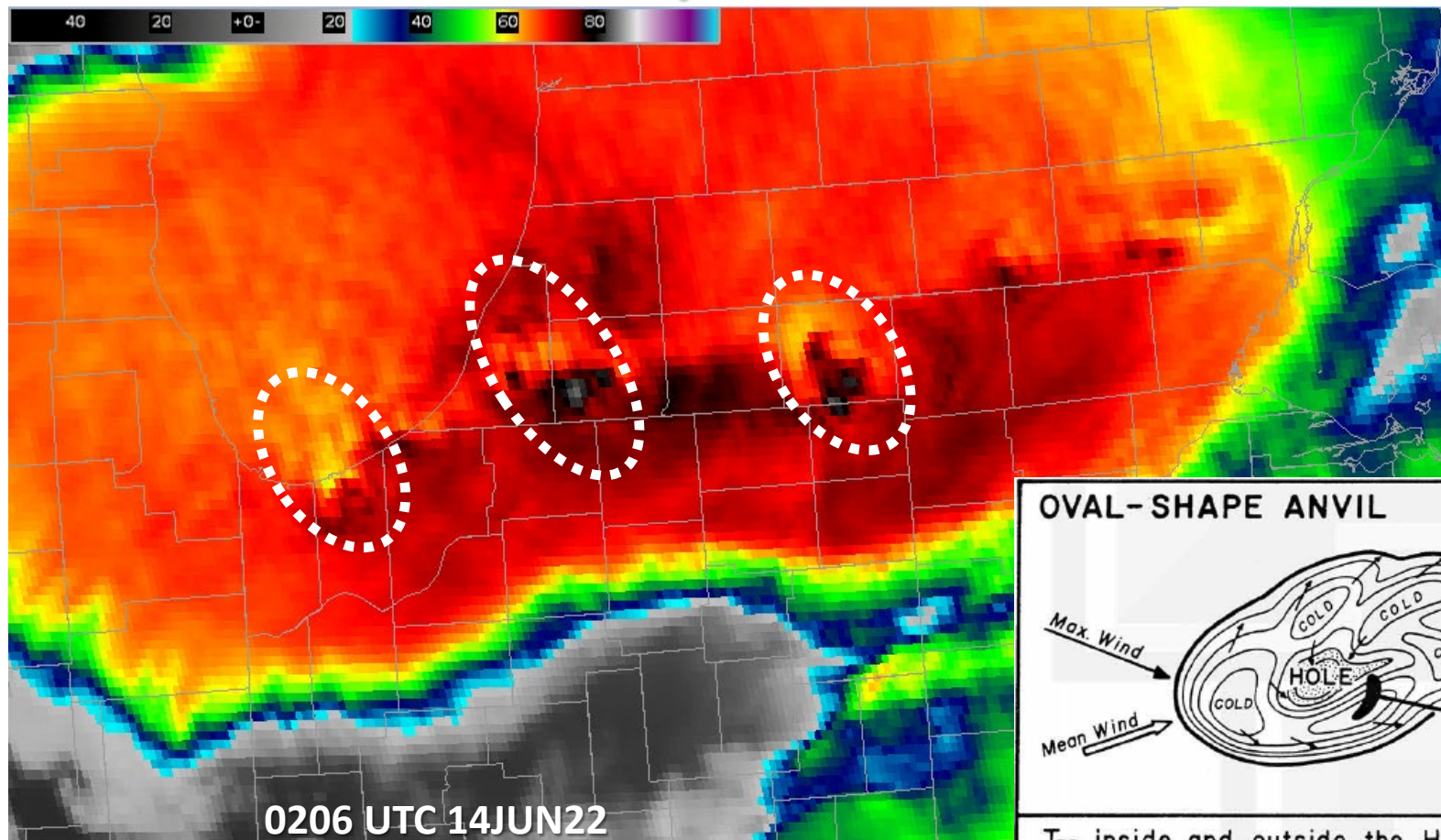
2205 UTC 13JUN22 - Big Deal ?



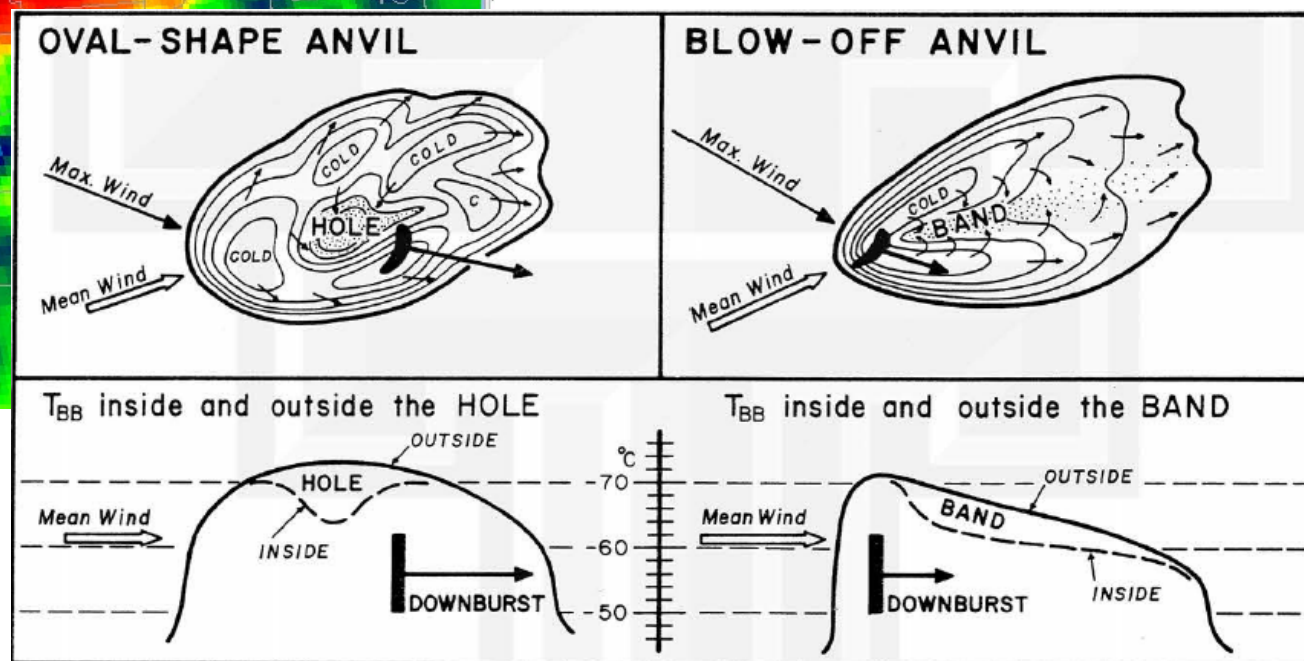
“YES !”



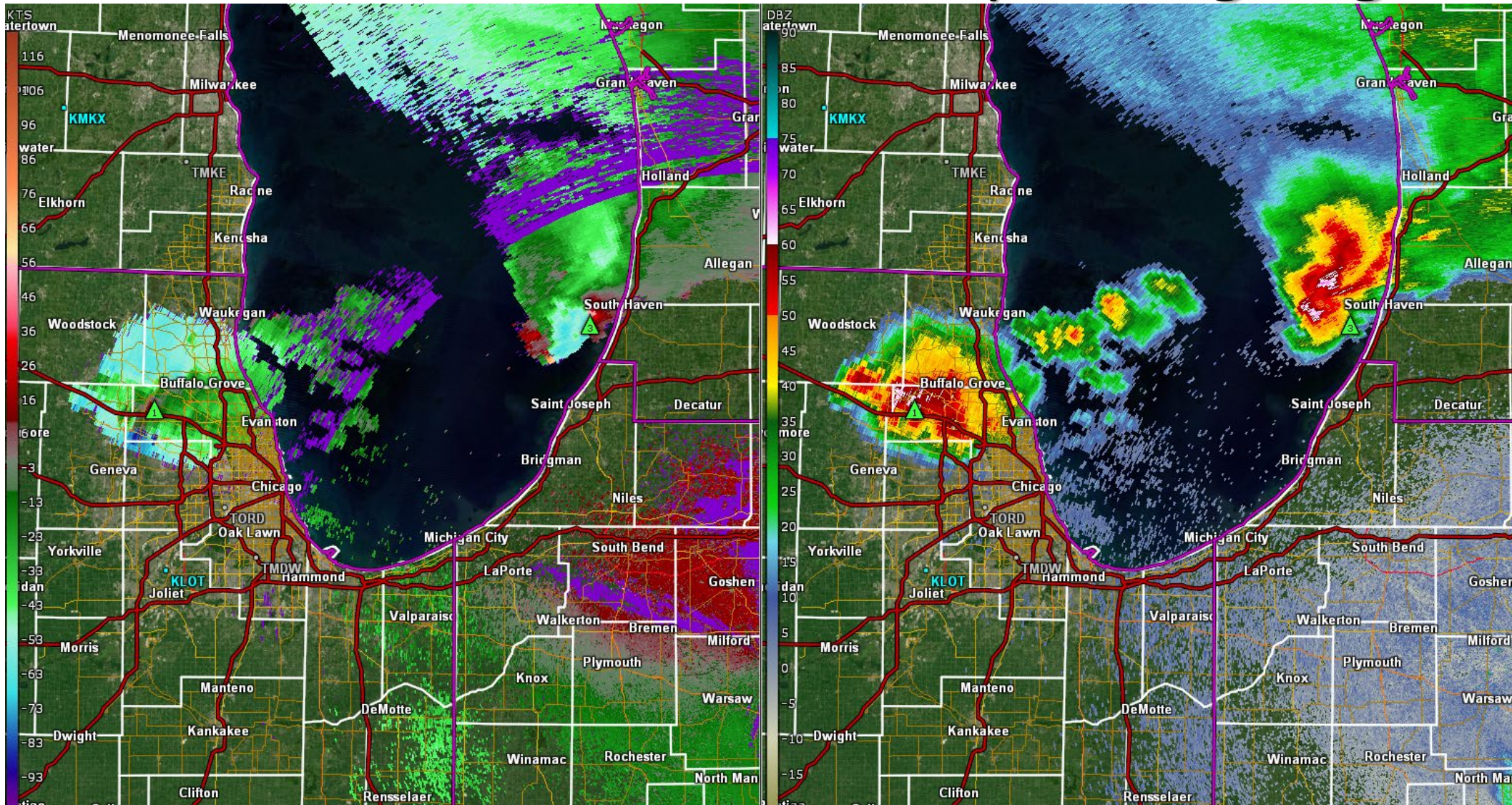
In the olden days...



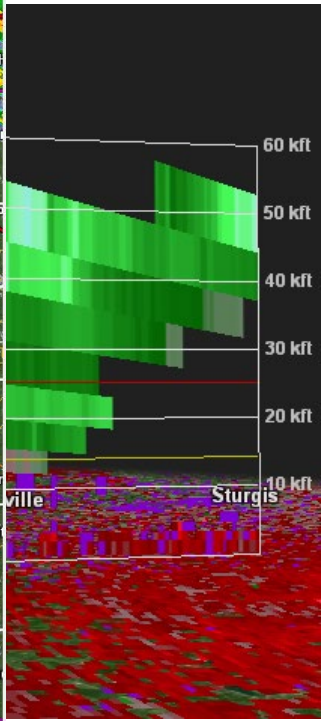
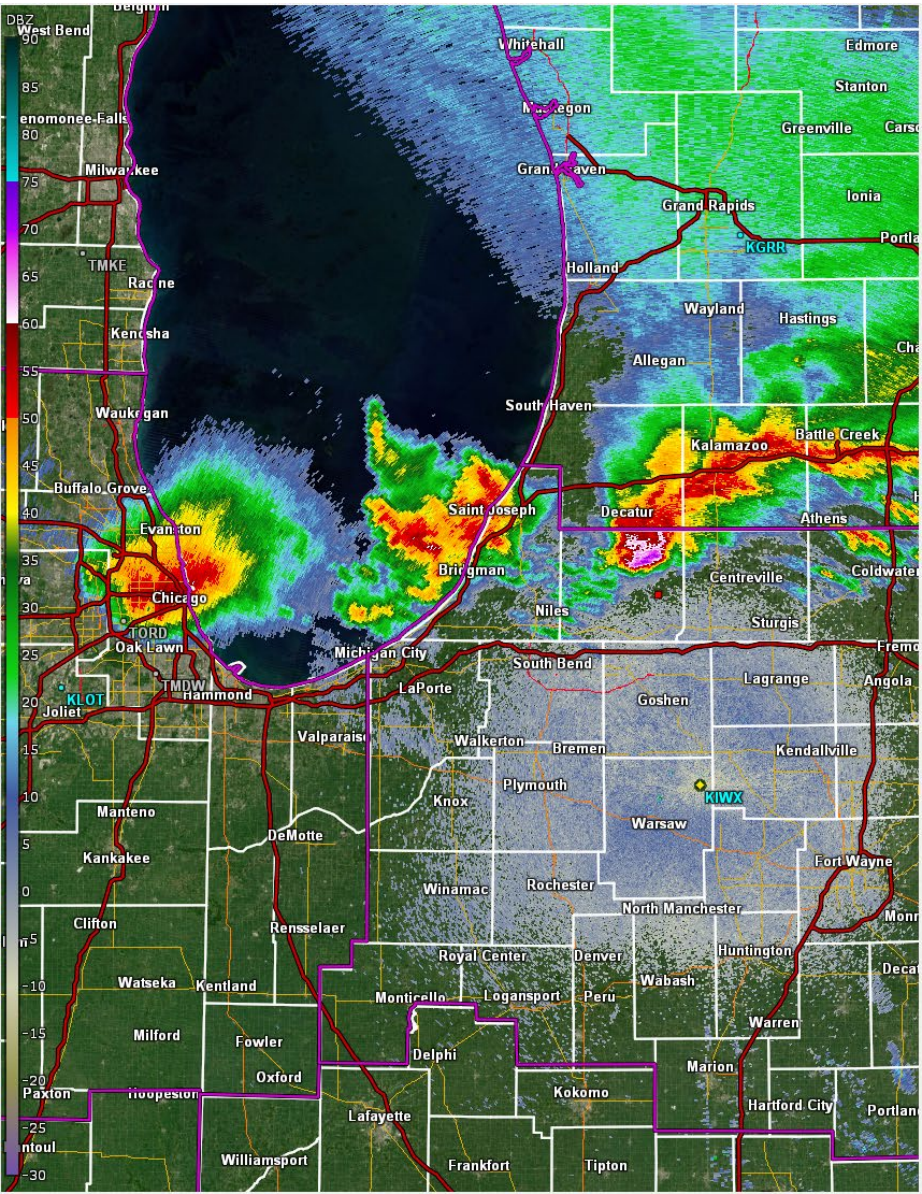
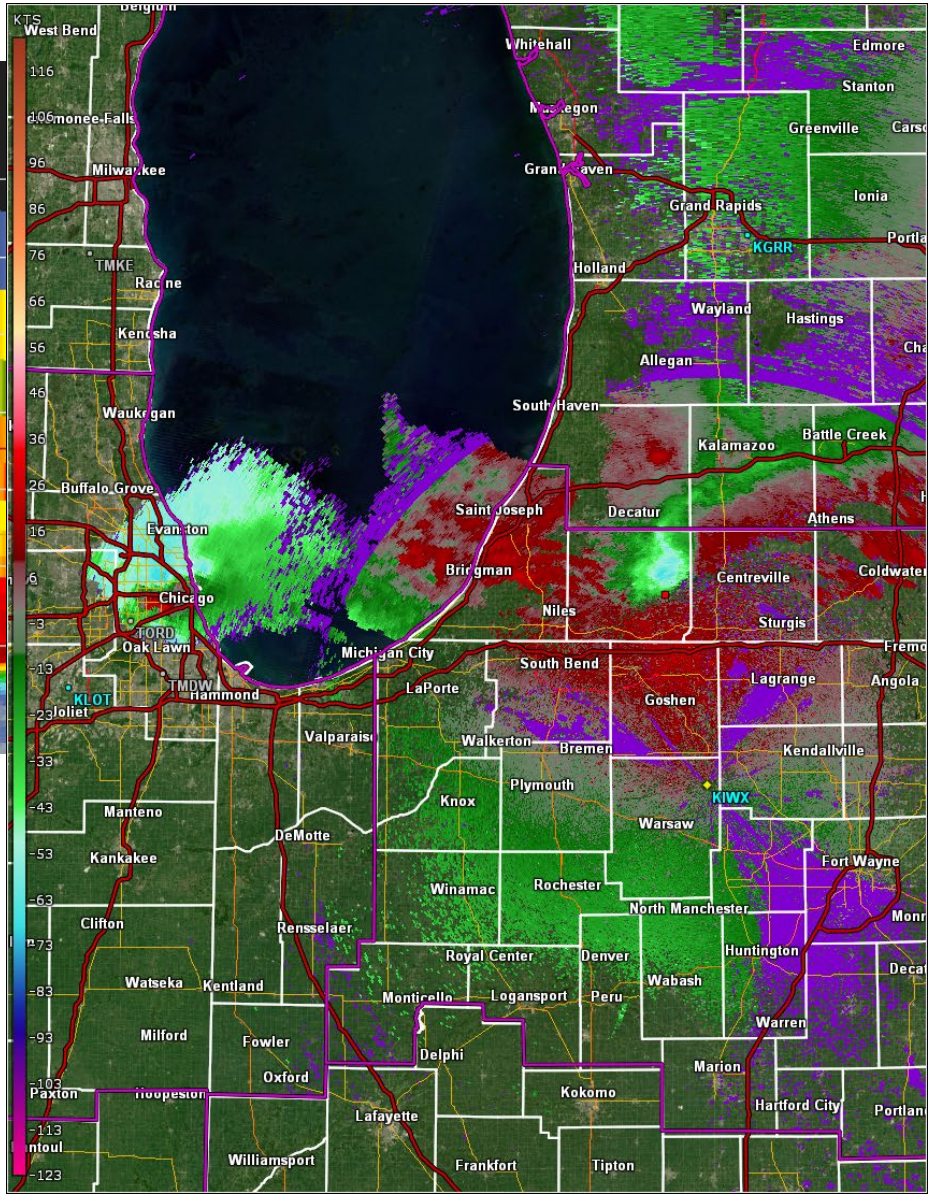
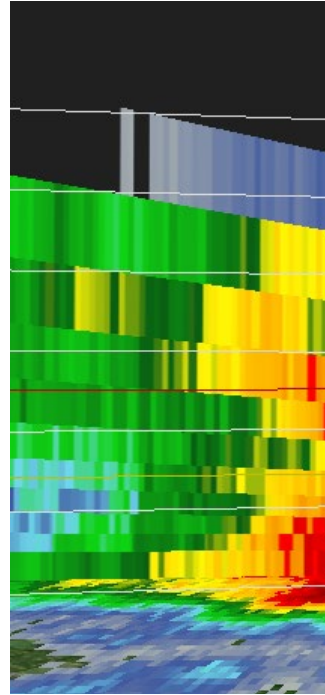
**Project NIMROD
Fujita, 1978**

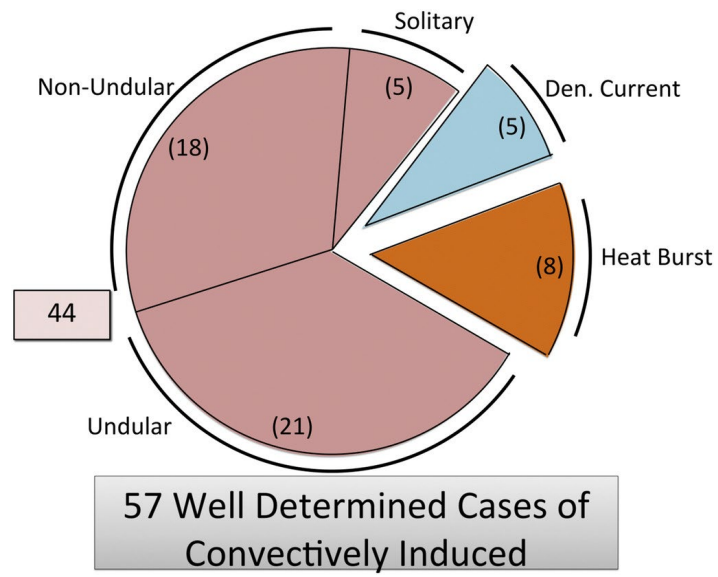
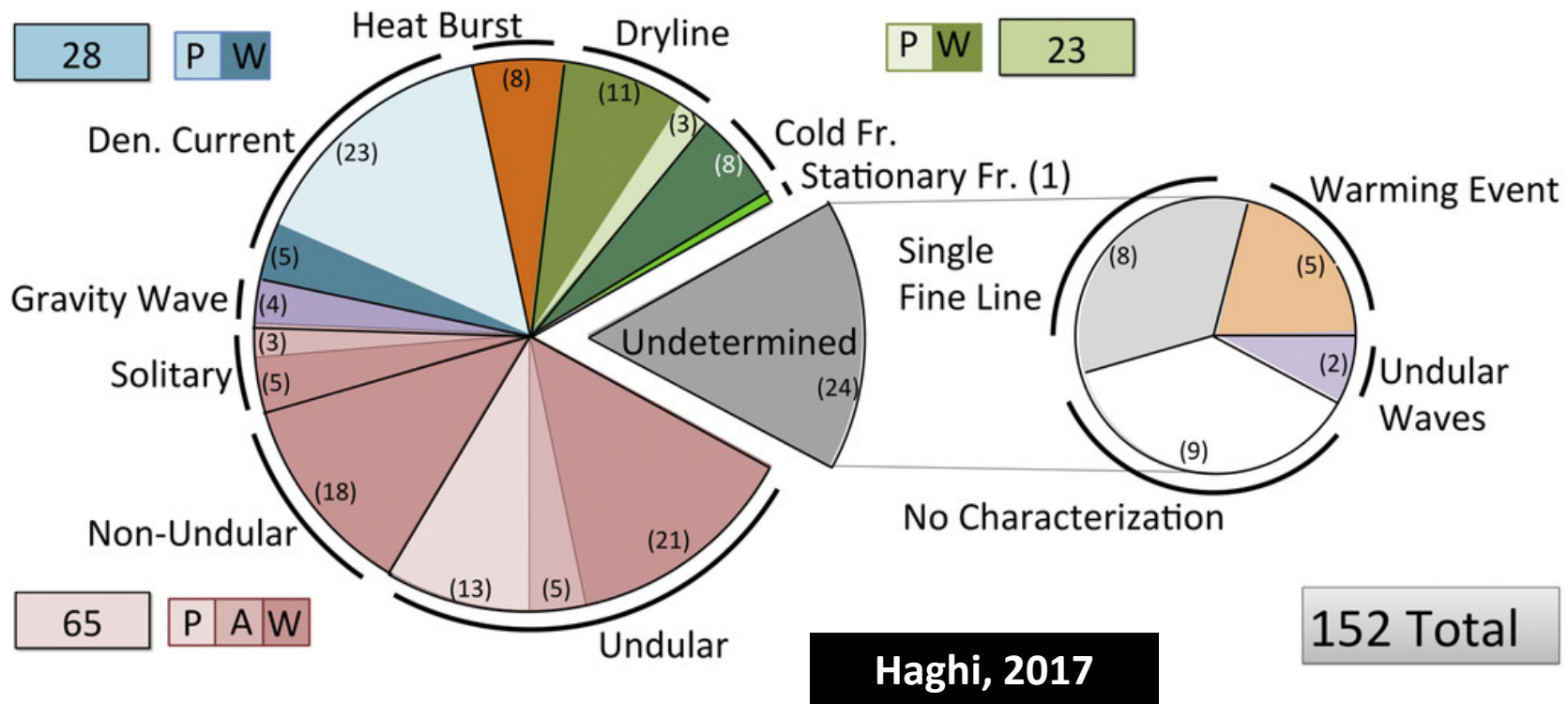


2307 UTC 13JUN22 - Let the spanking begin...



Three Rivers – 2359 UTC 13JUN22





PECAN Project -2015

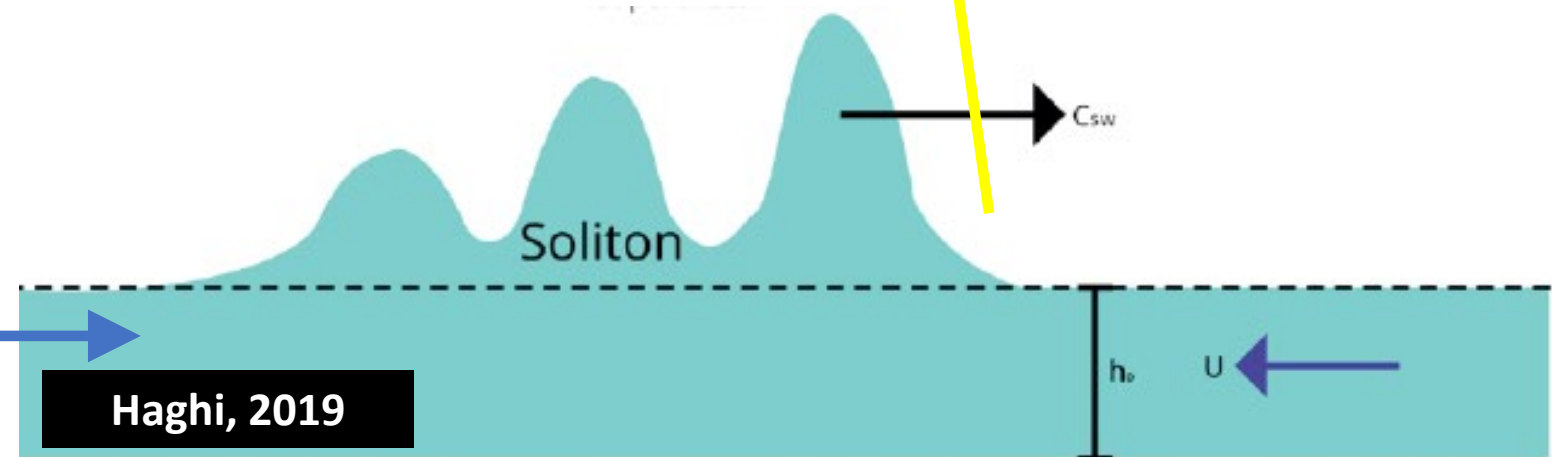
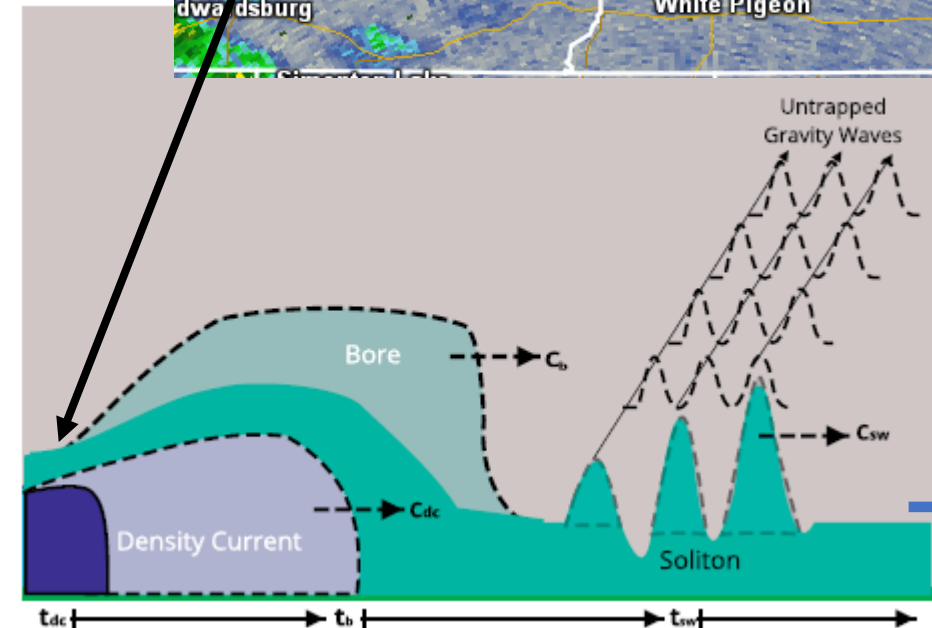
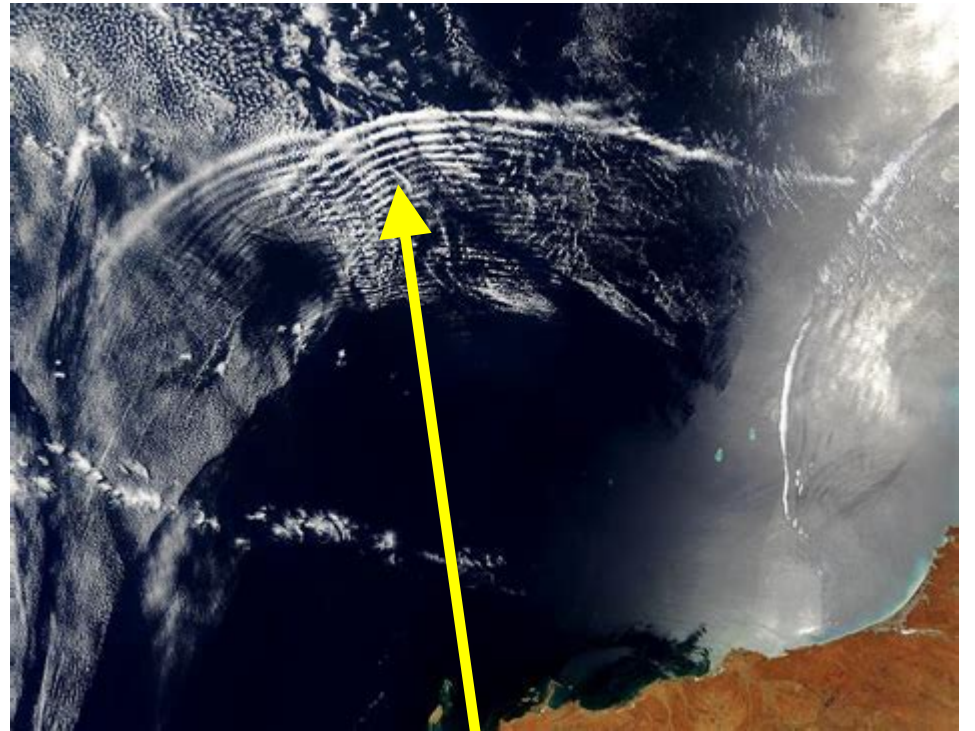
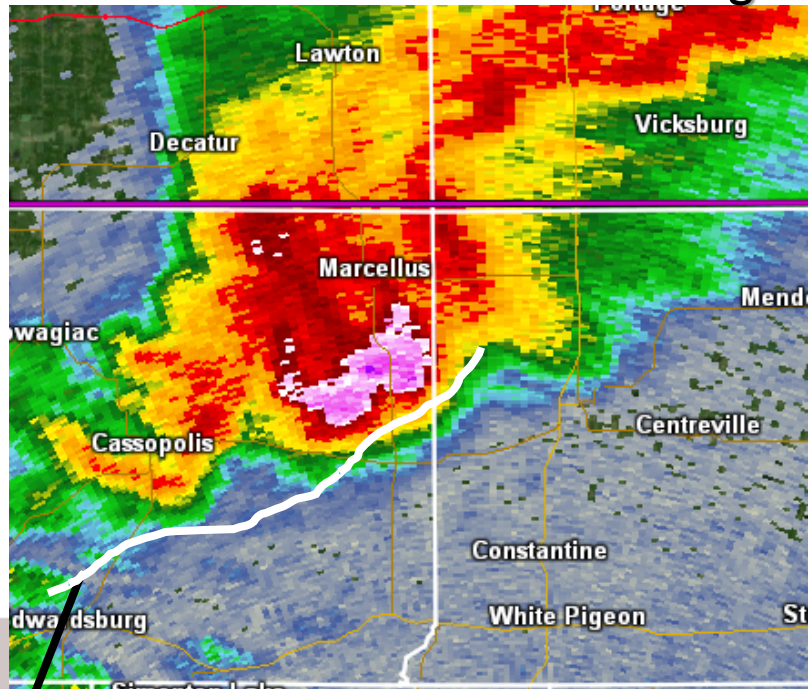
Plains Elevated Convection At Night

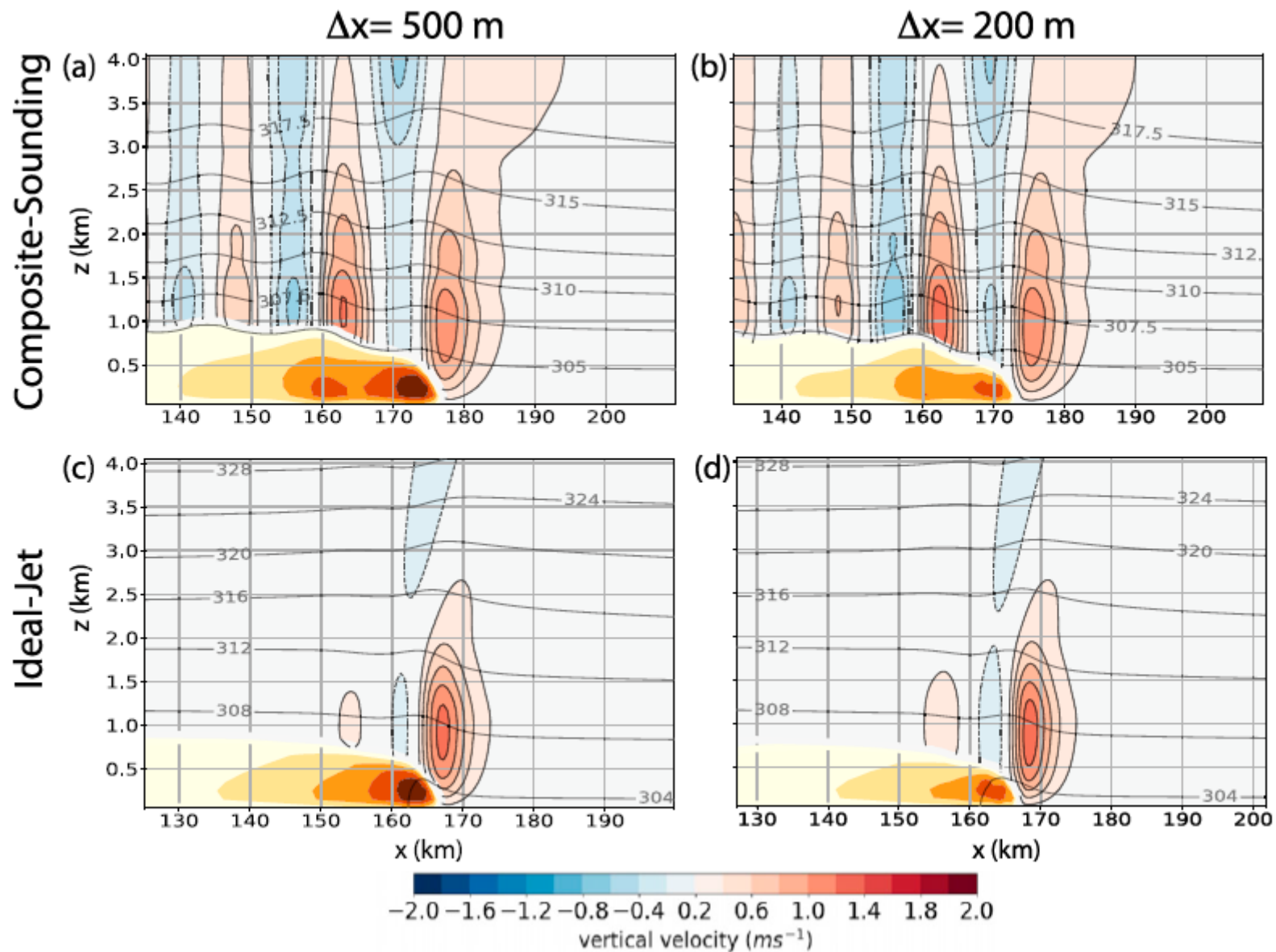
IHOP_2002

International H₂O Project

PECAN Project -2015

Plains Elevated Convection At Night





Typical Bore Observations & Dynamics

- TEMPERATURE: Steady or rising
- MIXING RATIO: Steady or decreasing
- PRESSURE: Rapid rise
- WIND: Rapid change in direction

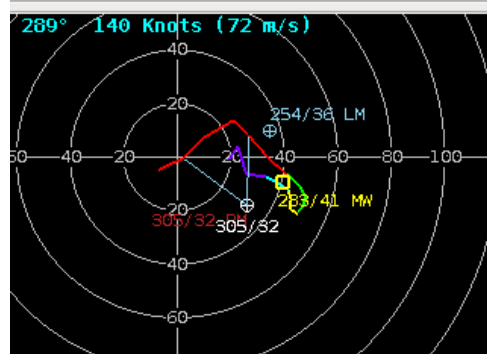
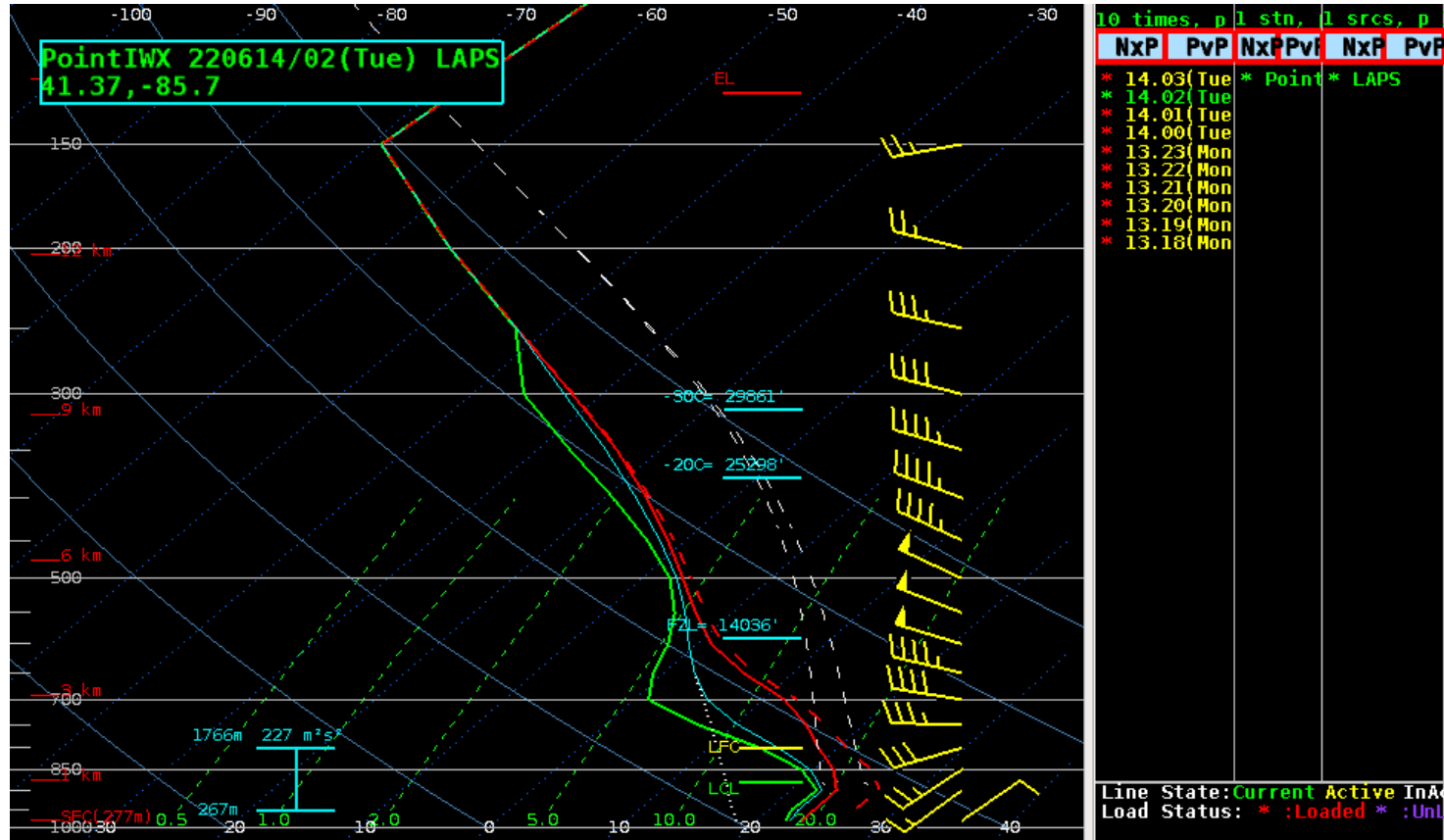
All are semi-permanent (not transient)

Destabilization of Boundary Layer

- Common consequence of bores
- Lower LFC
- Increase CAPE, reduce CIN
- Mix warmer, drier air to surface

Temperatures rise just ahead of storms arrival

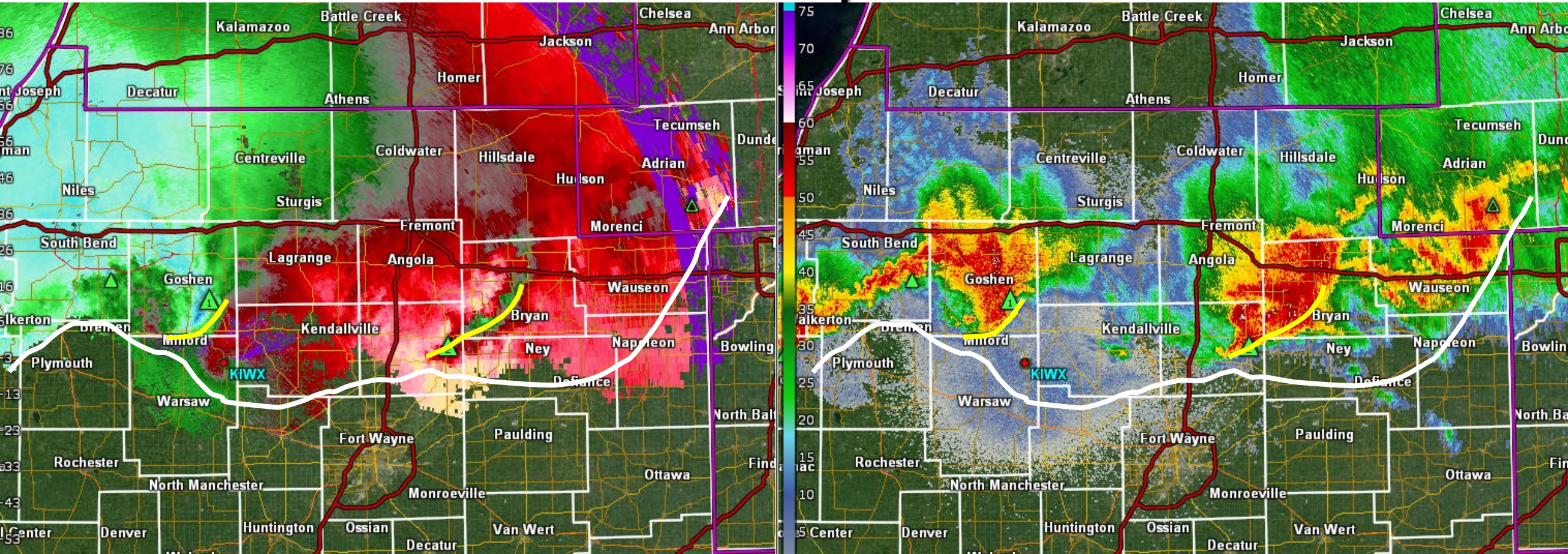
KIWX LAPS Sounding – 02Z



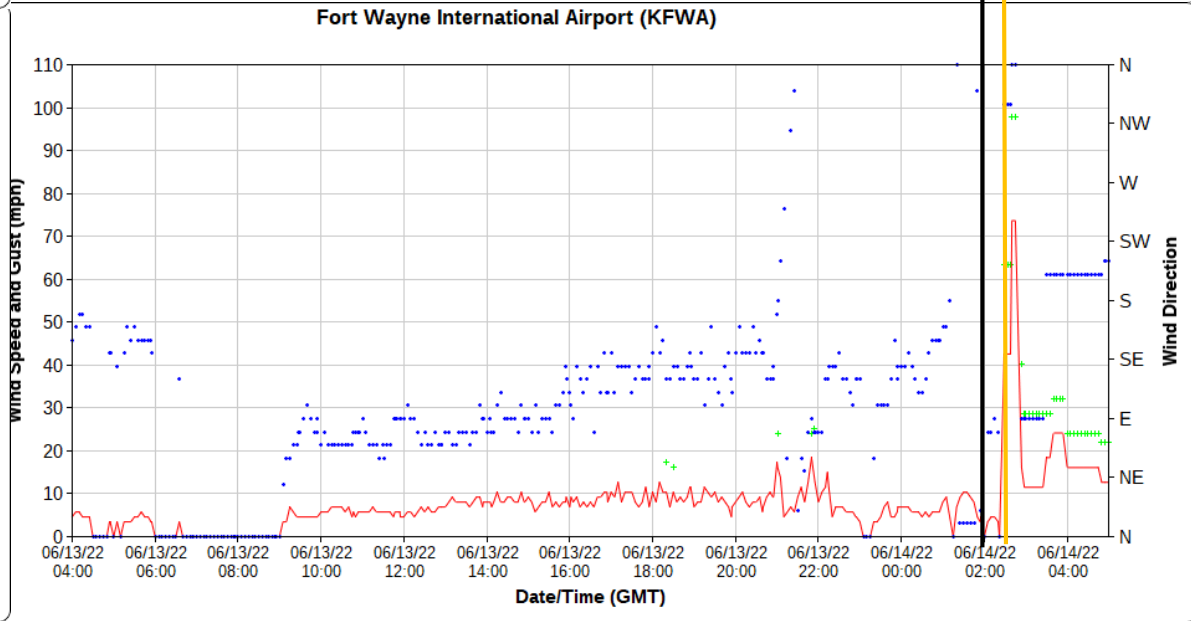
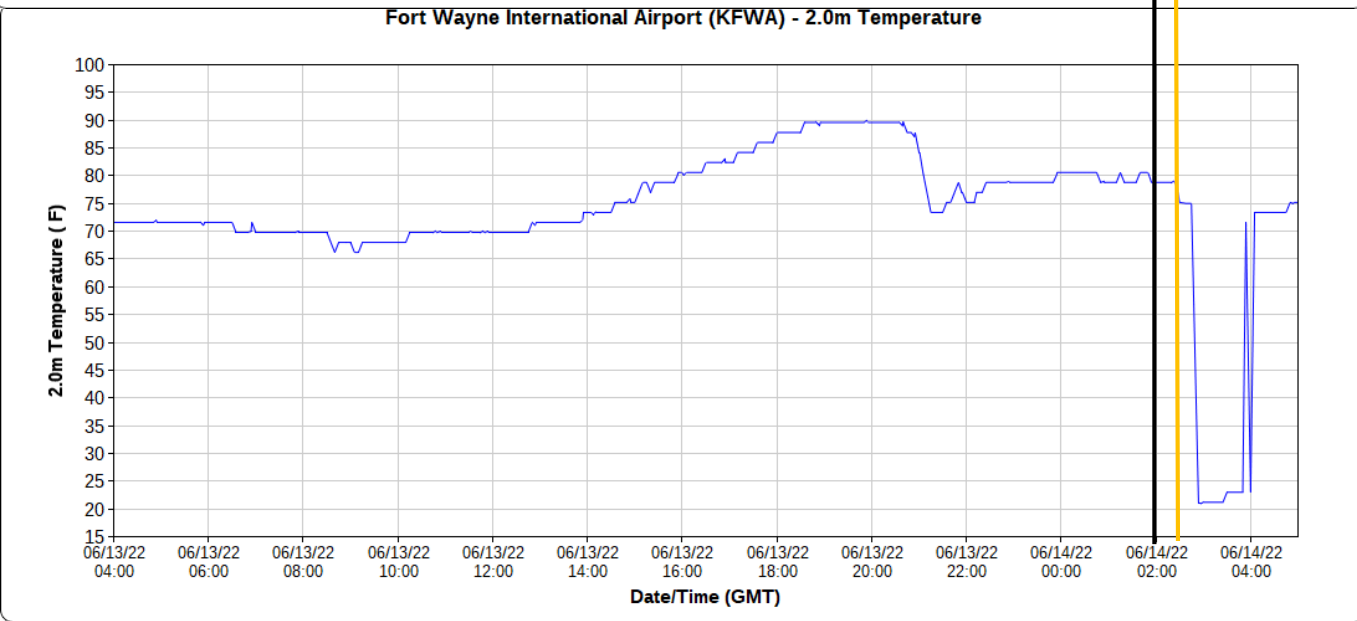
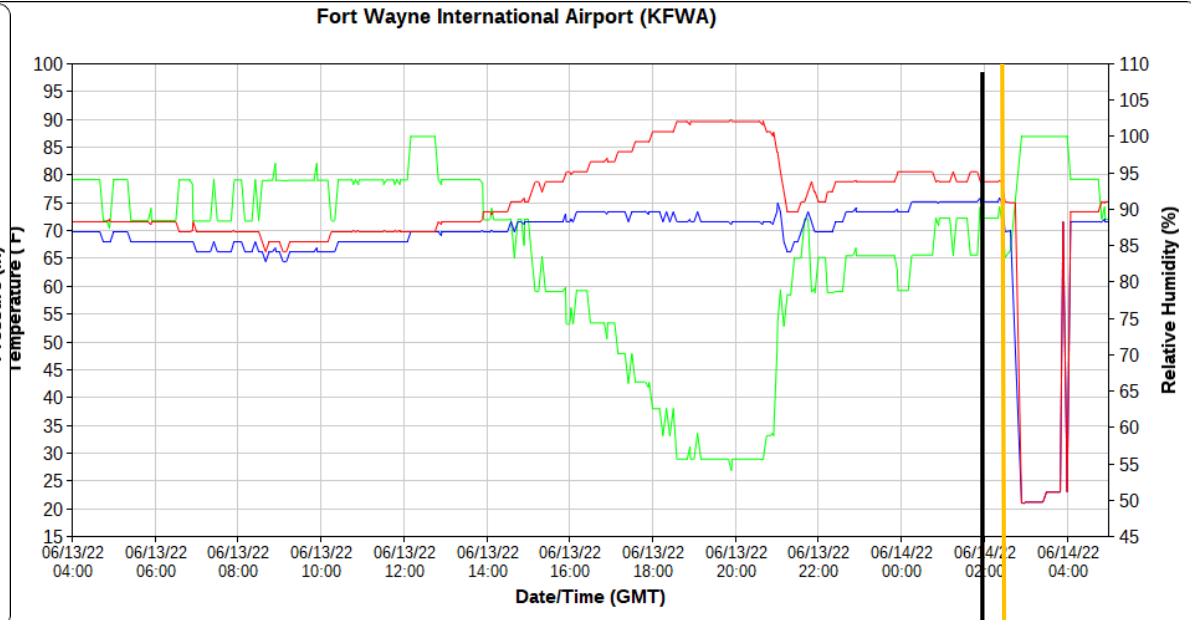
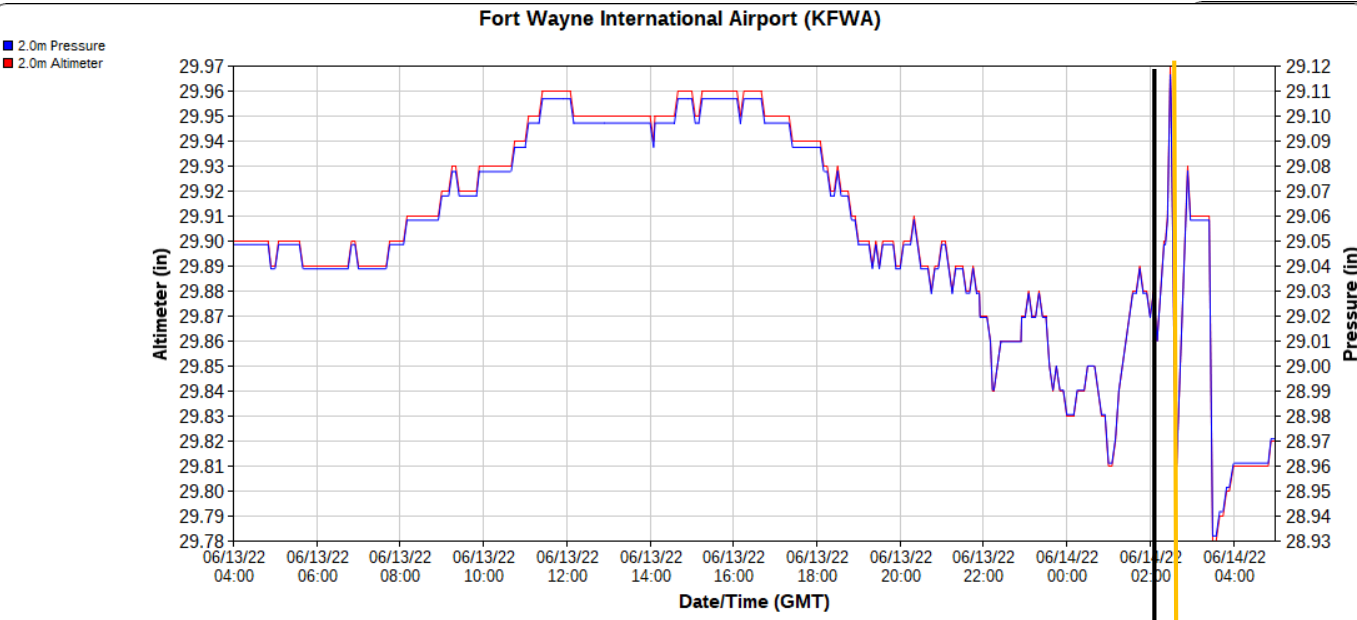
Sum1	CAPE	CINH	LCL	LI	LFC	EL
SB PARCEL	1335	-253	167m	-5	2956m	46285'
FCST PARCEL	3786	0	1412m	-10	1412m	48441'
MU PARCEL	3444	-12	939m	-9	1766m	48441'
ML PARCEL	2593	-75	693m	-8	2316m	46978'
USER PARCEL	2905	-7	1556m	-8	1873m	47696'
EFF PARCEL	2668	-32	1297m	-8	2036m	47696'

PW= 2.09 in	3CAPE= 35J/kg	WBZ= 12911'	WWDG= 0.00
K= 37	DCAPE= 828J/kg	FZL= 14036'	ESP= 0.00
MidRH= 62%	DownT= 65F	ConvT= 91F	MMP= 0.88
LowRH= 88%	MeanW= 17.9g/kg	MaxT= 93F	NCAPE= 0.26
stc-3km Agl LapseRate= 13C/5.1C/km			Supercell= 15.7
3-6km Agl LapseRate= 20C/6.8C/km			STP(CIN)= 0.0
850-500mb LapseRate= 29C/7.1C/km			STP(fixed)= 1.6
700-500mb LapseRate= 19C/7.0C/km			SHIP= 1.3

Outflows and bores both present

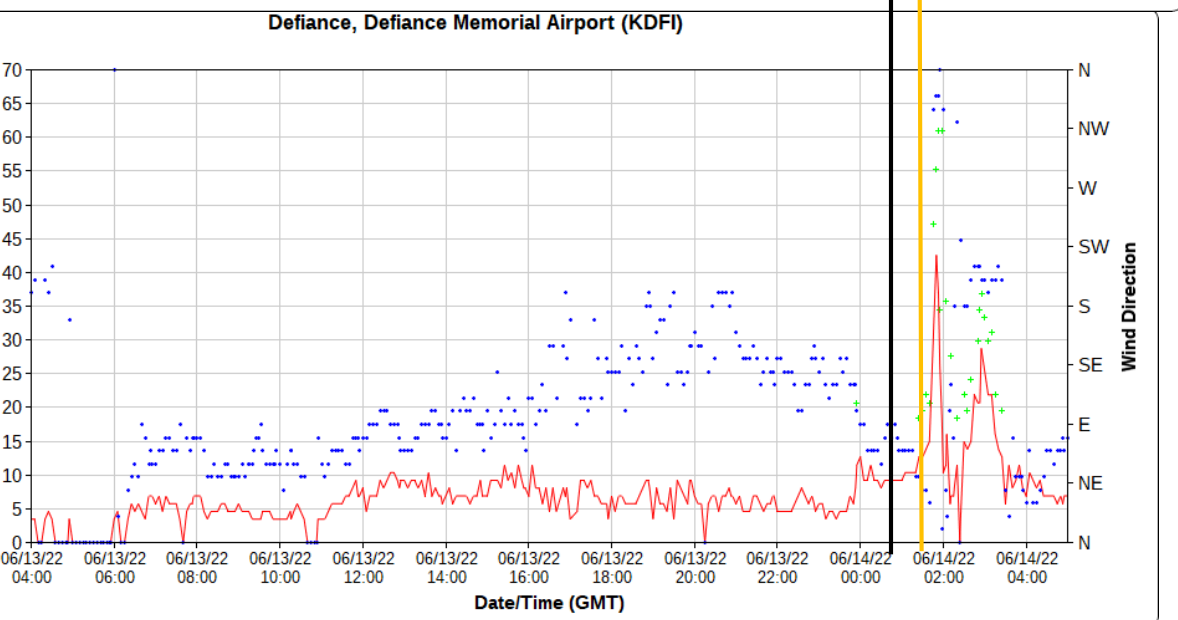
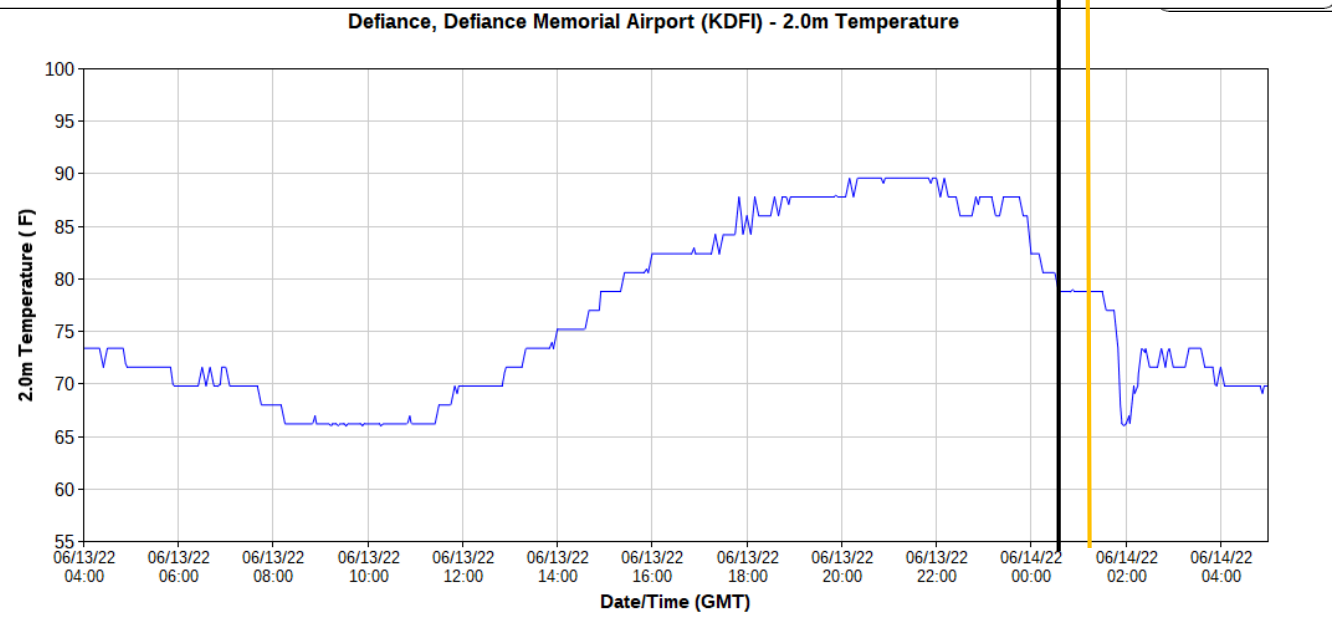
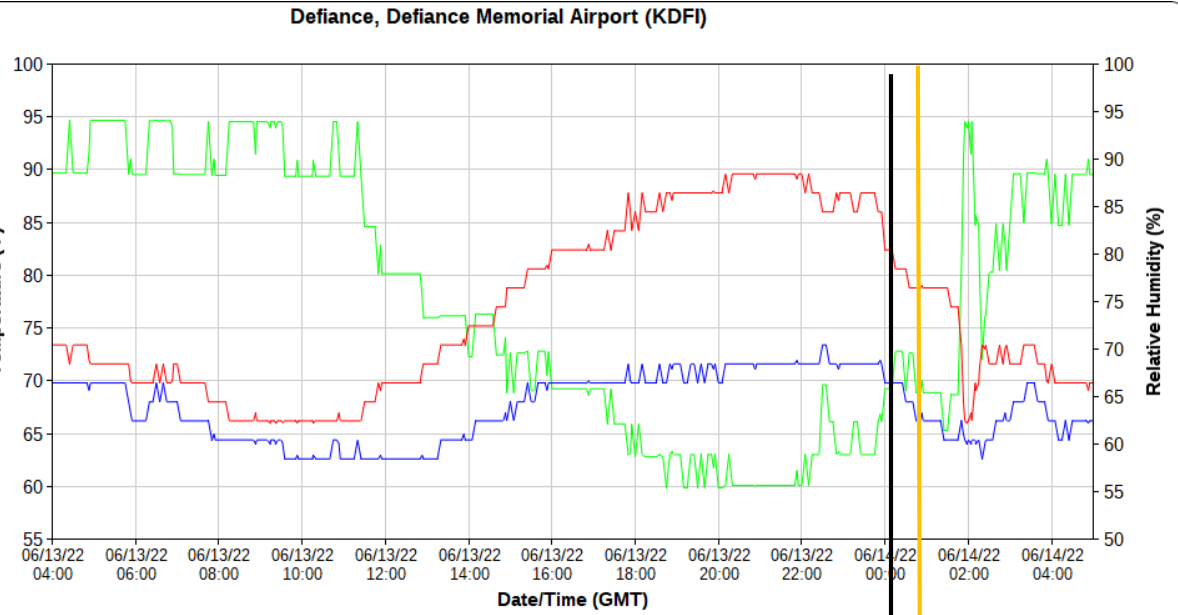
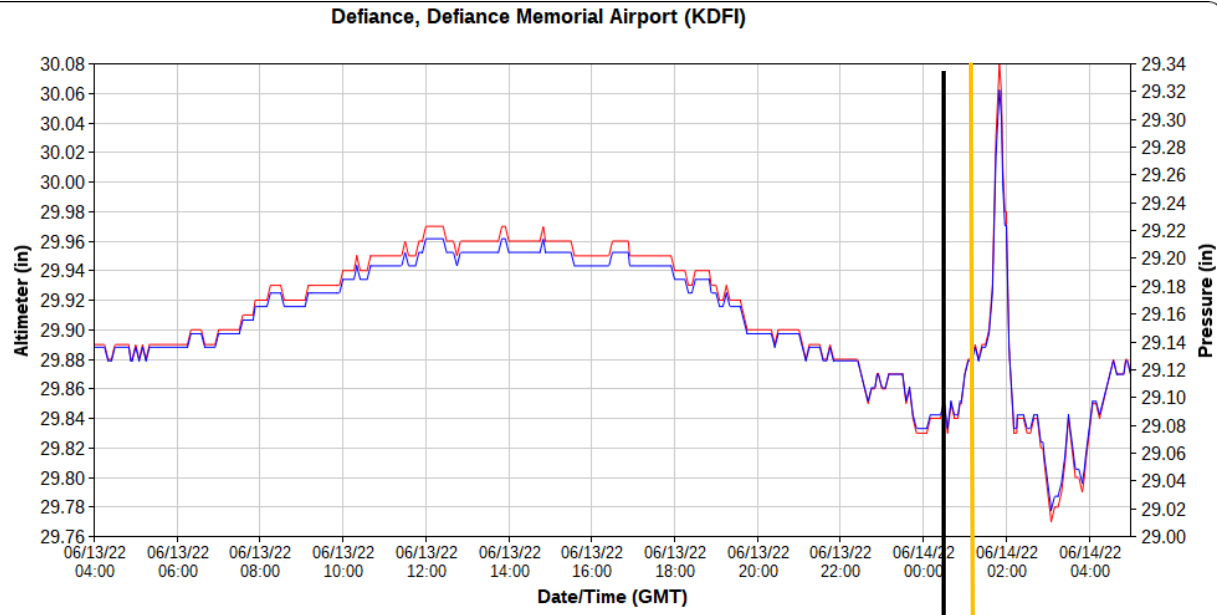


Fort Wayne



Defiance

2.0m Pressure
2.0m Altimeter

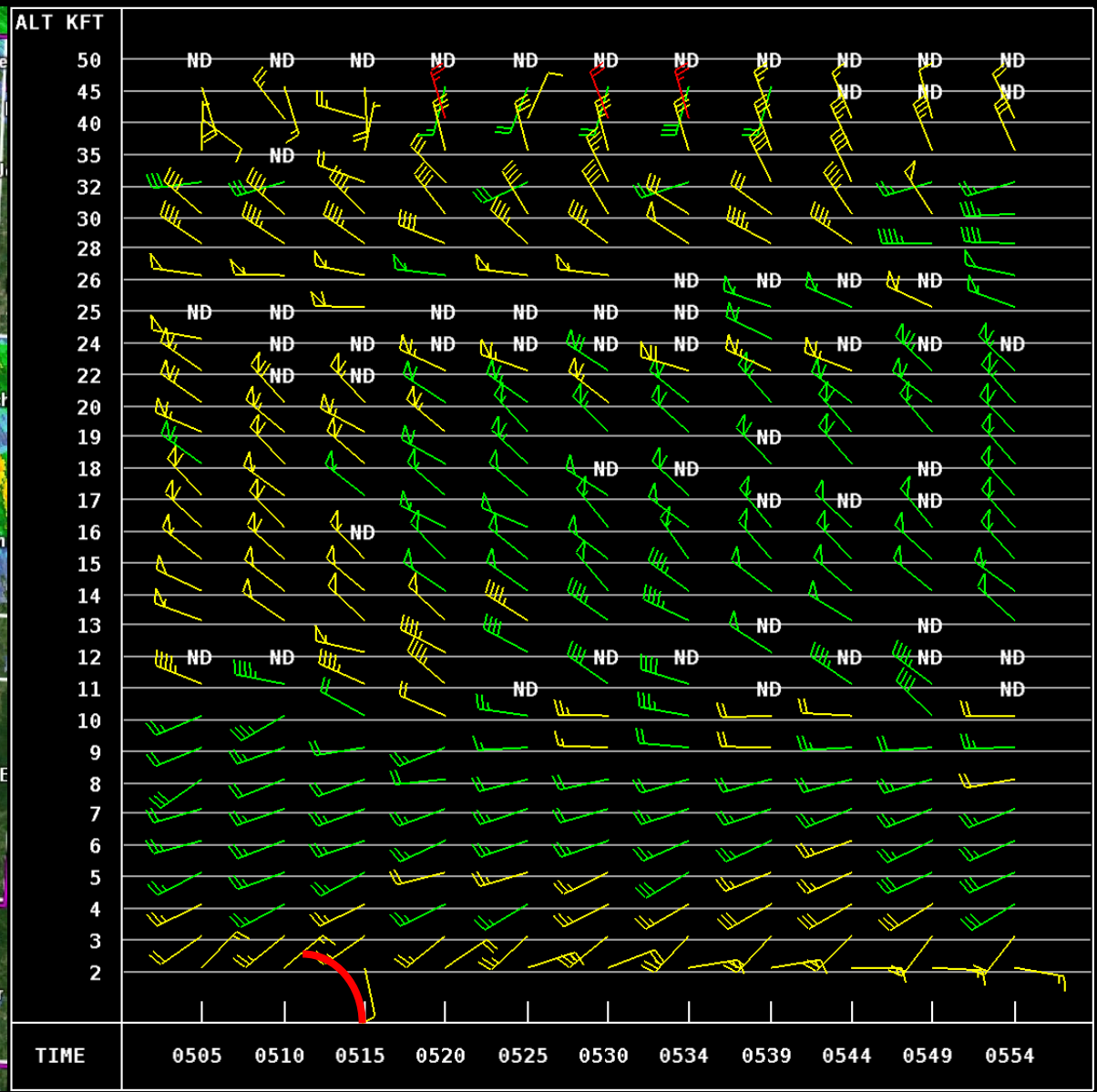
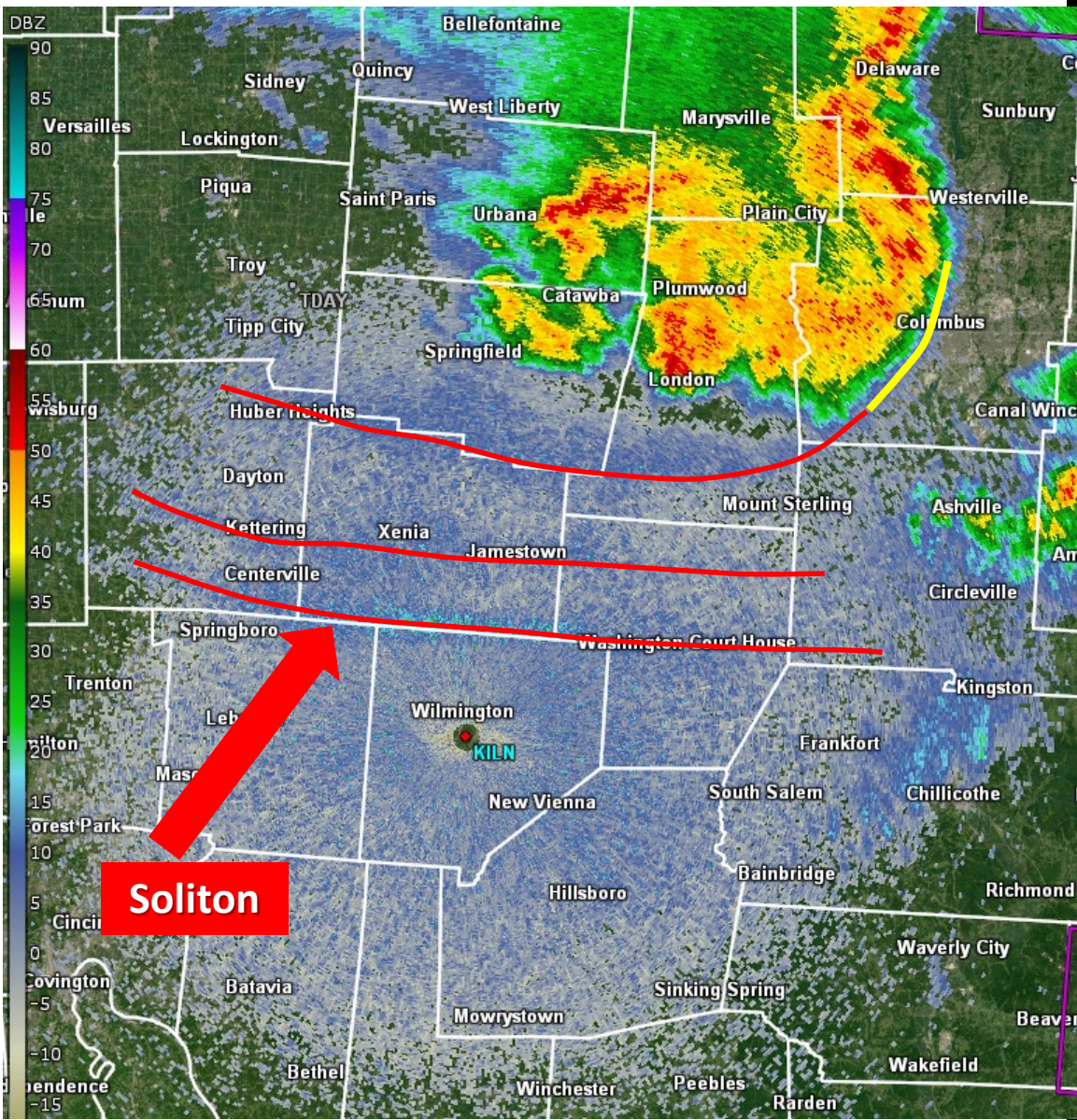




West-south Fort Wayne



KILN





Food for thought...

- How does convective initiation differ between a bore-driven and cold-pool driven line segment?
- How common is a bore-driven line segment?
- Does a bore-driven line segment increase or intensify the risk of severe weather?

References

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