

Near-Storm Environment Evaluation

Tornado			
Mesocyclonic Parameters	Necessary Value	Preferred Value	Value
0-1 km shear	≥15 kt	≥20 kt	
Significant Tornado Parameter (Eff)	>0	>1	
100 mb mean parcel mixed layer CAPE (MLCAPE)	>0 J/kg	>1500 J/kg	
100 mb mean parcel mixed layer CIN (MLCIN)	>-200 J/kg	>-50 J/kg	
100 mb mean parcel LCL height (MLLCL)	<2000 m	<1000 m	
Effective storm relative helicity ("eff inflow layer" in NSHARP)	>0 m ² /s ²	>150 m ² /s ²	
Effective bulk wind difference (EBWD)	≥25 kt	≥40 kt	
Non-Mesocyclonic Parameters	Necessary Value	Preferred Value	Value
Non-Supercell Tornado Parameter (Eff)		>1	
0-3 km mixed layer CAPE (3CAPE)	>0 J/kg	>100 J/kg	
Mixed layer CIN (MLCIN)	>-225 J/kg	>-25 J/kg	
0-1 km lapse rate (LR ₀₋₁)		>9° C/km	
Surface relative vorticity		>8x10 ⁻⁵ s ⁻¹	
0-6 km bulk wind difference	≤35 kt	≤25 kt	
QLCS Parameters (Three Ingredients Method)	Necessary Value	Preferred Value	Value
0-3 km line normal bulk shear		≥30 kt	
Rear inflow jet or outflow caused surge in line		Yes	
0-3 km mixed layer CAPE (3CAPE)		≥40 J/kg	
Tornado Potential (circle one): No, Yes, Yes – Significant			

Hail				
Parameters	Base Severe (≥1")	Significant (≥2")	Giant (≥4")	Value
Freezing/melting (0 °C) level				
-20 °C level (ft AGL)				
Large Hail Parameter (LHP) (LGHAIL" in NSHARP)	≥4	≥5	≥8	
Most unstable CAPE (MUCAPE)	≥1600 J/kg	≥1850 J/kg	≥3000 J/kg	
Effective bulk wind difference (EBWD)	≥30 kt	≥40 kt	≥46 kt	
700-500 mb lapse rate (LR ₇₀₀₋₅₀₀)		≥6.5 °C/km	≥7.0 °C/km	
Surface to equilibrium level bulk shear (Shear _{EL}) ("LCL-EL (Cloud Layer)" in NSHARP)		≥46 kt	≥60 kt	
Significant Hail Parameter (SHIP)		>1		
Hail Potential (circle one): No, Yes, Yes - Significant				

Wind			
Wet Microburst Parameters	Necessary Value	Preferred Value	Value
0-3 km maximum theta-e difference (Δθ _e)		≥25 K	
Microburst Composite (MBCP)	5-8	≥9	
Surface-based CAPE (SBCAPE)	≥3100 J/kg	≥4000 J/kg	
0-3 km lapse rate (LR ₀₋₃)	>8.4 °C/km		
Downdraft CAPE (DCAPE)	≥900 J/kg	≥1100 J/kg	
Precipitable water	≥1.5"		
Dry Microburst Parameters	Necessary Value	Preferred Value	Value
Inverted-V sounding (apex based in midlevels)		Yes	
Most unstable CAPE (MUCAPE)	1-500 J/kg		
100-mb mean parcel LCL height (MLLCL)	>3 km AGL	Above Melting Layer	
0-3 km lapse rate (LR ₀₋₃)	≥Dry adiabatic		
Effective bulk wind difference (EBWD)		<30 kts	
QLCS/Derecho Parameters	Necessary Value	Preferred Value	Value
Derecho Composite Parameter (DCP)		>2	
Downdraft CAPE (DCAPE)	>0 J/kg	>980 J/kg	
0-6 km mean wind		>16 kt	
Most unstable CAPE (MUCAPE)	>0 J/kg	>2000 J/kg	
Effective bulk wind difference (EBWD)		>20 kt	
Wind potential (circle one): No, Yes, Yes - Significant			