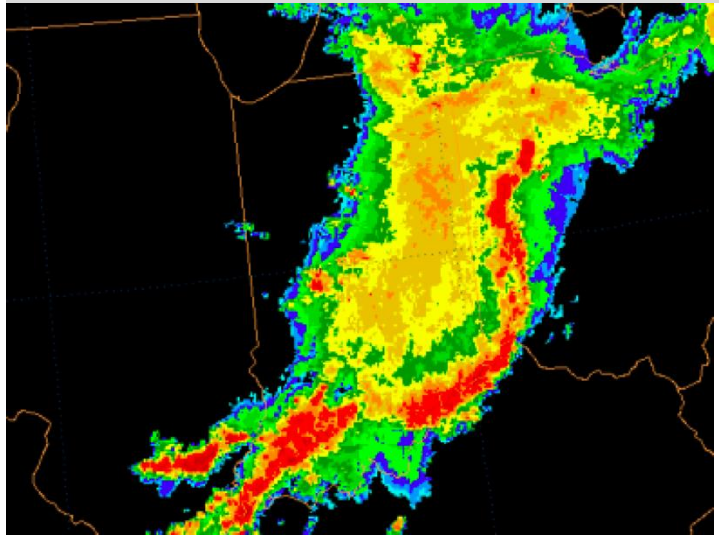
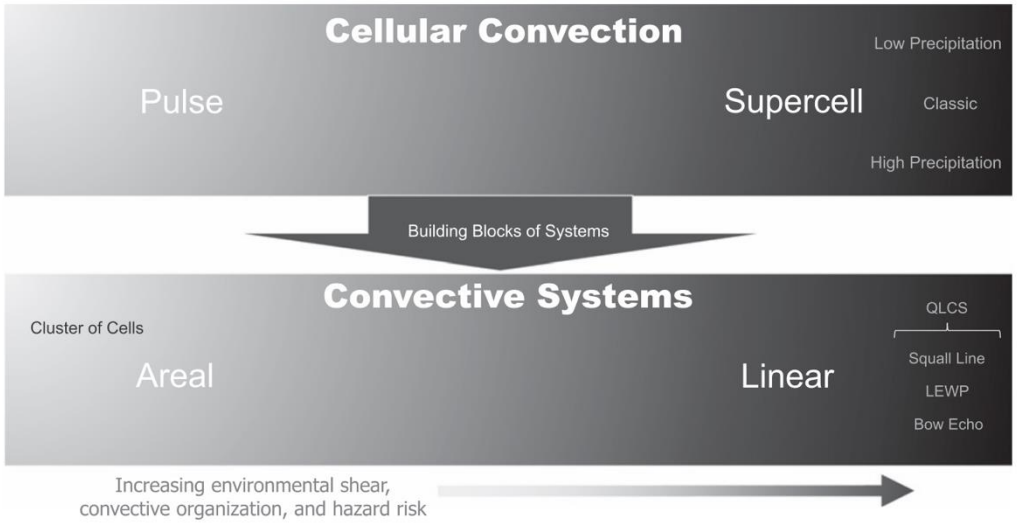
Characteristics, Classification and Climatology of Quasi-linear Convective Systems (QLCS)

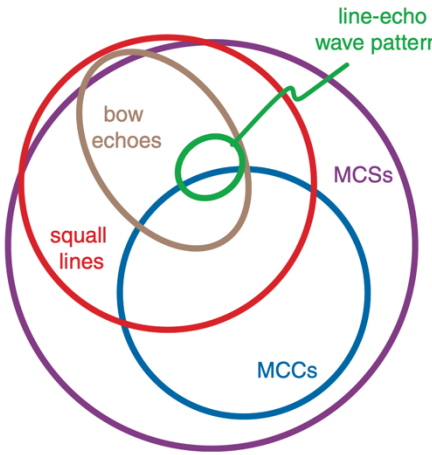
What is QLCS?



A QLCS with a prominent bow echo

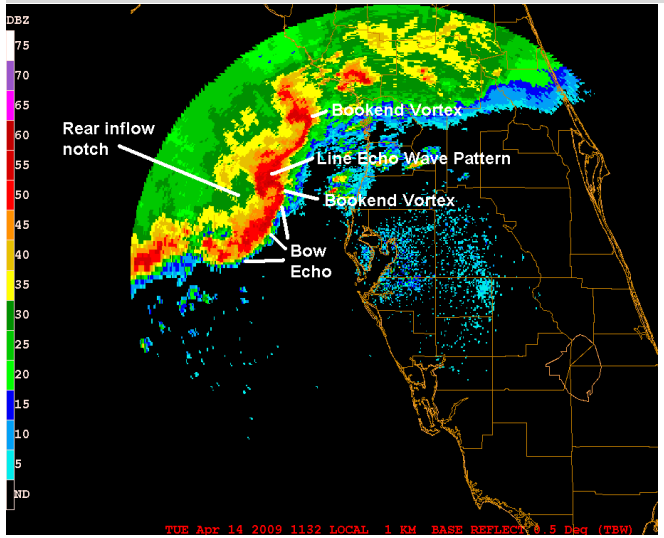
Classification and Methodology



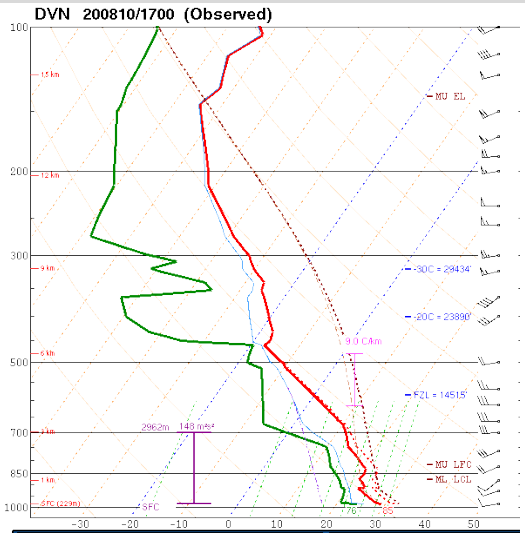


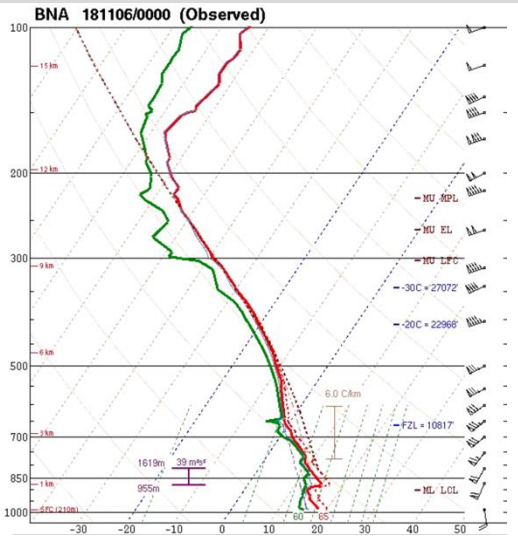
A chart showing how small-scale convective cells provide "building blocks" for larger convective systems, along with the relationship with environmental wind shear (left), classifications of various mesoscale convective systems (right)

Radar Characteristics



Formation Environment





Warm Season (Summer)

- Generally east-west frontal boundary
- Strong surface convergence
- Associated with very unstable air mass: maximum 2400 J/kg of CAPE in genesis area, and 3500-4000 J/kg of CAPE onward.
- Winds at 850 and 700 mb show good directional shear near genesis area, speed shear parallel to storm track downwind

Cool Season (Winter – Late Spring)

- Compared to warm season, associated with less instability → CAPE values very from less that 500J/kg – 2000J/kg
- Moderate/strong wind shear within the lowest 2.5 km layer (850mb – 700mb)
- Strong low level jet, 45+ kts leads to high shear.
- Degree of instability varies widely