Snow Banding Reference Sheet, Side A

Compiled by
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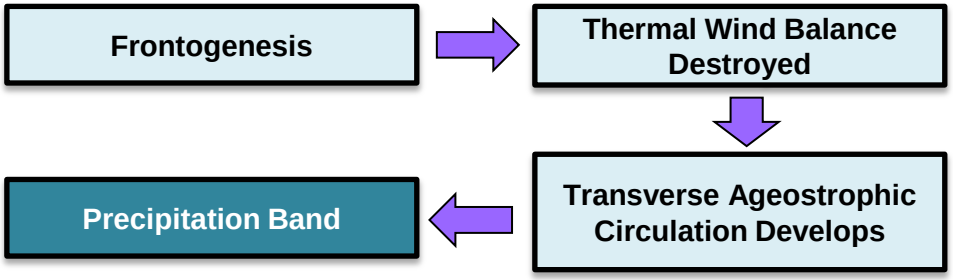
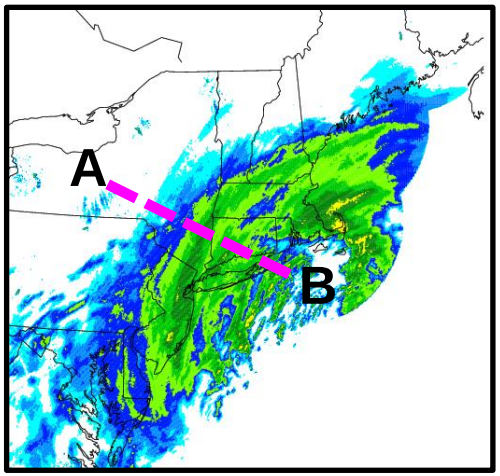
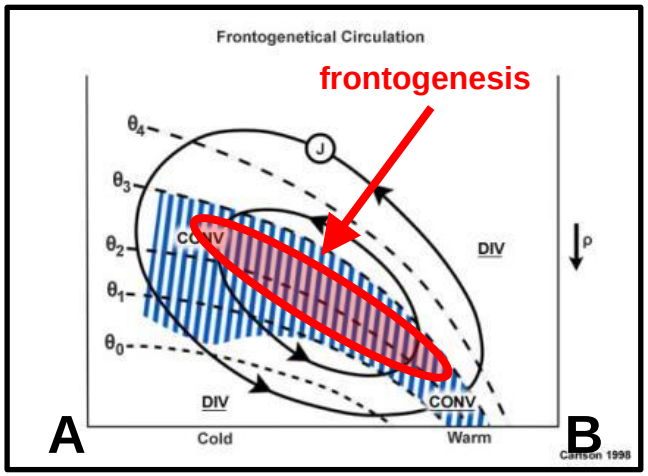
WFO Raleigh

Basics of Formation



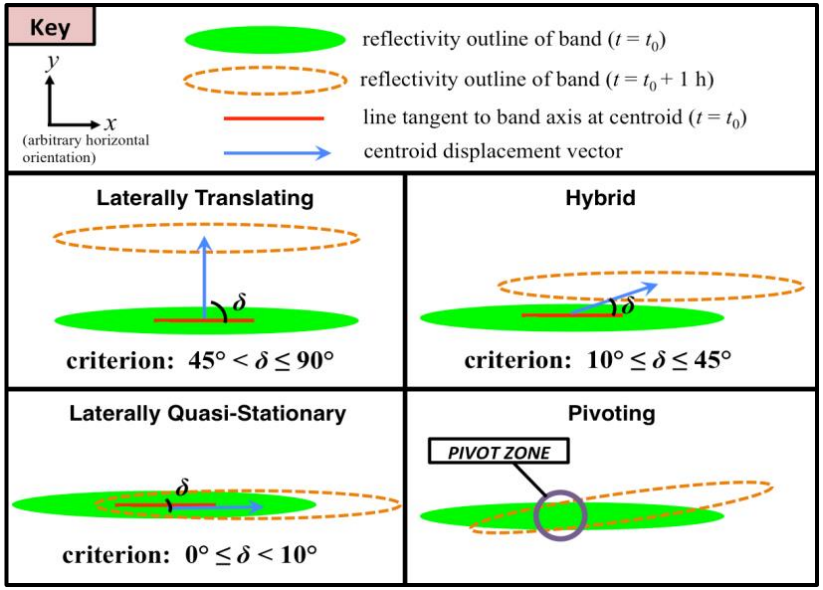
The circulation and resulting band becomes more intense as stability above the frontal zone decreases. EPV or lapse rates above the frontal zone can be used to assess stability; EPV values near or just above zero indicate weak stability, negative values indicate instability.





Adapted from Carlson (1998), courtesy UCAR

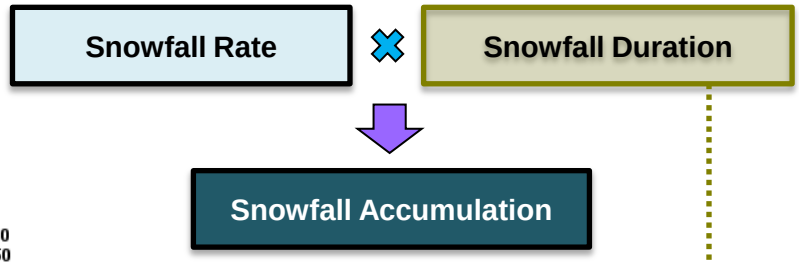
Types of Bands



Classified by angle between motion vector and band orientation

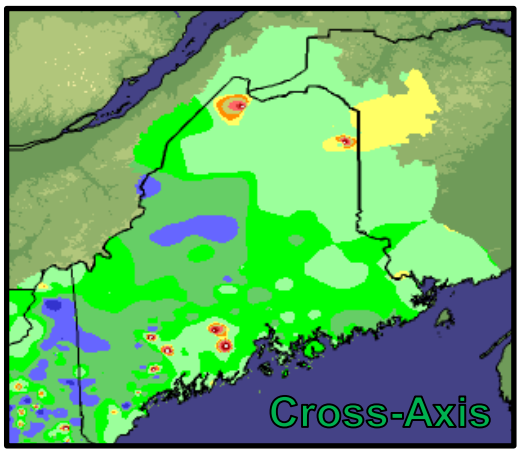
Required persistent aspect ratio of 4:1, reflectivity ≥ 25 dBZ and ≥ 10 dBZ above surrounding reflectivity, and total snowfall ≥ 6"

How Motion Affects Amounts

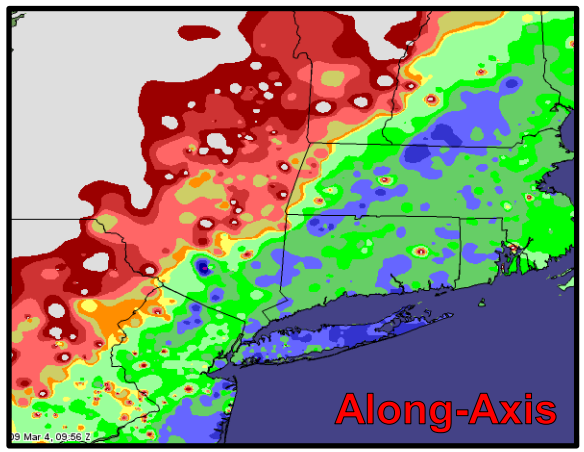


Mesoscale snowband motion influences whether pronounced snowfall accumulation gradients will be observed

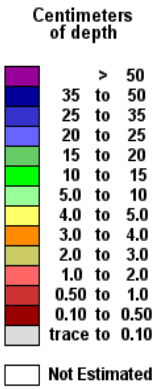
Note the tight gradient of snowfall amounts in the along-axis case to the left, with relatively uniform amounts in the cross-axis case.



(Often laterally translating)



(Often laterally quasi-stationary)



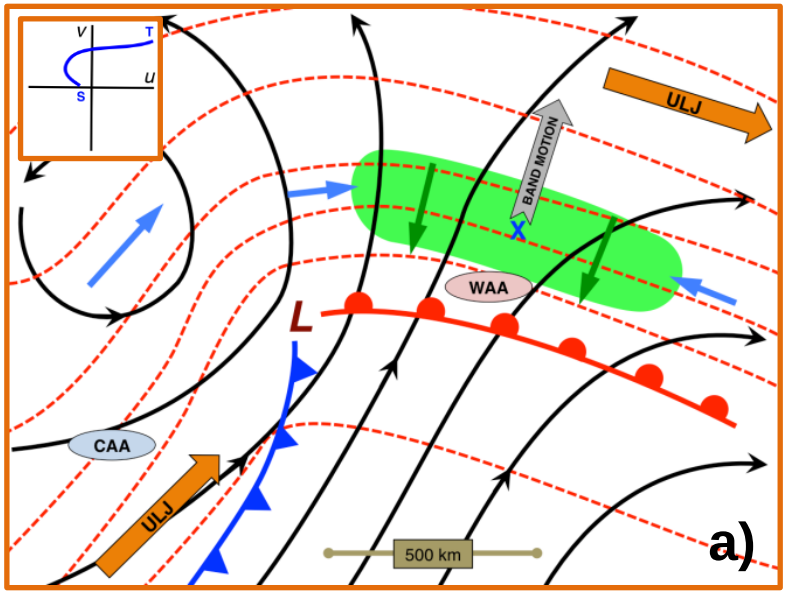
Source: NOHRSC

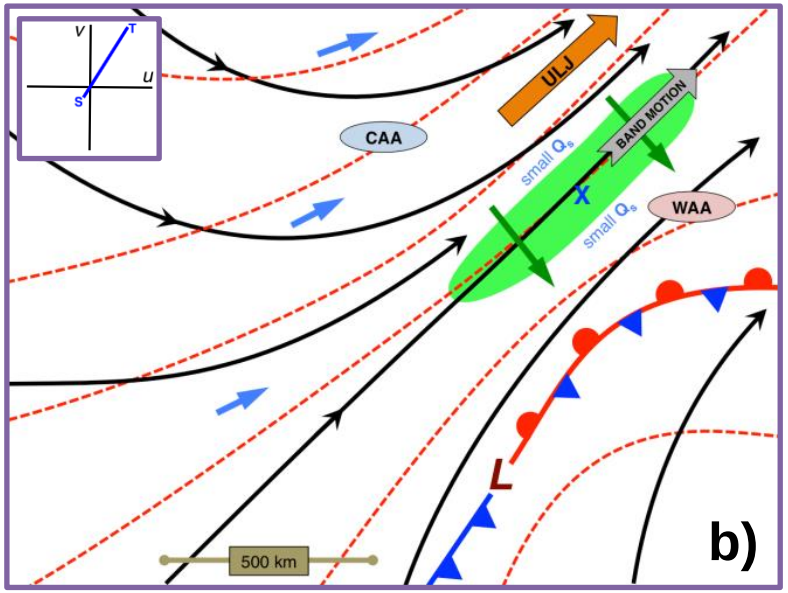
Snow Banding Reference Sheet, Side B

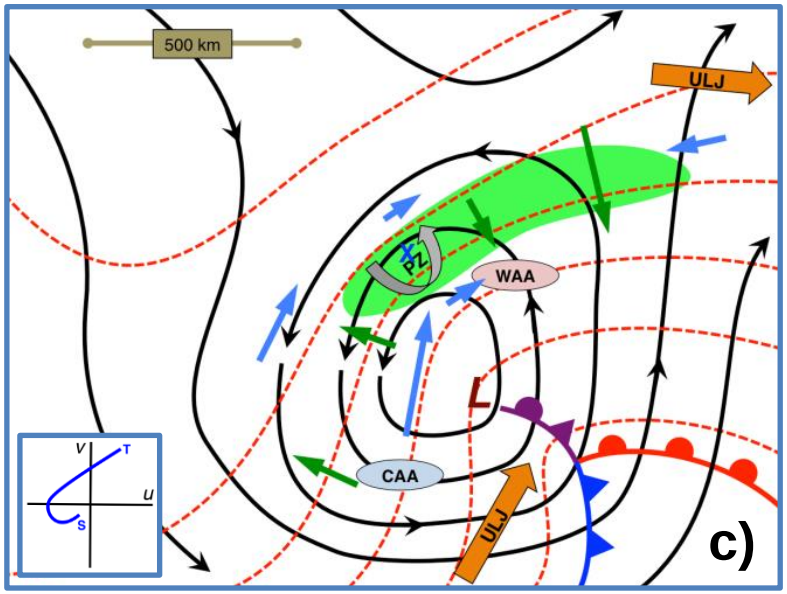
Typical Features for Each Type

Reference: Kenyon, J. S., D. Keyser, L. F. Bosart, and M. S. Evans, 2014: "The Motion of Mesoscale Snowbands in Northeast U.S. Winter Storms", NWS Eastern Region Webinar.

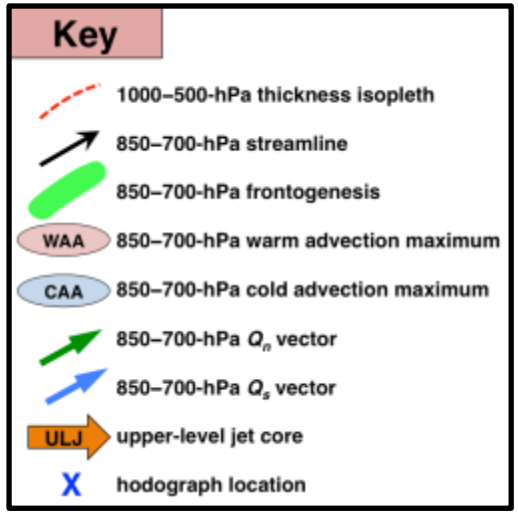
Thanks to M. Evans for additional comments and suggestions on an early version of this document.







a) Laterally translating
b) Laterally quasi-stationary
c) Pivoting



Field/Feature	Laterally translating	Laterally quasi-stationary	Pivoting
Position relative to surface cyclone	East	North	Northwest, near thermal inflection point
Position relative to upper-level jet	Equatorward entrance region (oriented NW-SE)	Equatorward entrance region (oriented SW-NE)	West, sometimes associated with coupled jets
Mid-level relative humidity	Within region of near-saturation	Adjacent to horizontal RH gradient, near edge of precip	Near dry slot/comma head interface
850-500 mb flow	Diffluent, frontogenetical	Confluent, frontogenetical	Cyclonically curved, frontogenetical
Position relative to 850-700 mb low	Well east of closed cyclone	East of trough	Immediately north of closed cyclone
Low-level temperature advection	WAA along band; band occurs on cold side of WAA maximum	Weak/neutral temperature advection along band	Pivot zone within WAA, but west of max; warm/cold advection dipole along isotherms
Q_n vectors	Frontogenetical, convergence	Frontogenetical, convergence	Frontogenetical and frontolytical, convergence
Q_s vectors	Convergence along band	Small vectors; weak/neutral convergence	Large, downshear-directed vectors; strong convergence