

A comparative analysis of two heavy banded snow events for the East Coast and the Central US

Austin Gibbons

Saint Louis University

Mike Evans

NOAA/NWS Forecast Office, Binghamton, New York

Chad Gravelle

Saint Louis University

Emily Eisenacher

Saint Louis University

The forecasting process involving mesoscale heavy snow bands has always provided quite a challenge due to the immense amount of parameters involved in their evolution. Due to the relatively limited spatial scale to which these heavy snow bands affect, the forecasts of timing and placement become paramount. However, the developmental location of these systems may induce different controlling factors in the timing and placement of these heavy snow bands. A comparative analysis of two heavy banded snow events, one from the east coast, 16 December 2003, and one from the central US, 15-16 December 2007, will allow us to determine the different possible parameters integral to the development of these snow bands.

Within the analysis of these two heavy banded snow events, several parameters will be investigated, including frontogenesis, equivalent potential vorticity, moisture content, the presence of instability (inertial, static, symmetric), as well as the thermodynamic structure. In utilizing these parameters, a detailed investigation into the roles of the conveyor belts in the organization of heavy snow bands will outline the large-scale atmospheric processes at play. Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) models will be utilized to aptly display the parcel trajectories within each of the conveyor belts to highlight their respective roles. Comparing the role of the different atmospheric processes in these similar, but different events, will increase our understanding of the controlling factors within heavy banded snow development, and allow for increased understanding of the spatial and temporal scales of these bands.