

Structure and propagation of midlatitude cyclones in the Southeastern United States

Rosana Nieto Ferreira

Thomas M. Rickenbach
Linwood Hall

Department of Geography, East Carolina University, Greenville, NC 28590, USA

The seasonal and interannual variability of the structure, evolution, and propagation of midlatitude cyclones in the southeastern United States are studied using a composite analysis.

Our composites show that during winter the axis of the cyclone's upper-level trough remains north-south oriented and propagates eastward along 40°N, while during summer the cyclone's upper-level trough has much slower propagation at a farther north latitude and an axis that is tilted in the northeast-southwest direction. Upper-level circulation changes are consistent with a shift from wintertime 'cyclonic behavior' to summertime 'anticyclonic behavior' midlatitude cyclones. Significant changes in the low-level structure and precipitation patterns of midlatitude cyclones that ensue from these upper-level changes will be discussed.

The composite analysis was repeated for midlatitude cyclones classified into five types according to their region of origin: 1) *U.S. Rockies*, 2) *Canadian Rockies*, 3) *Gulf Low*, 4) *Hatteras Low*, or 5) *Stationary*. A composite analysis is used to examine the differences in the structure, evolution and propagation between these cyclones during the winter season. Overall *Gulf Low* and *U.S. Rockies* cyclones bring most of the wintertime precipitation observed in the southeastern U.S.

Preliminary results from a radar-based climatology of the mesoscale precipitation organization within midlatitude cyclones in the Southeast U.S. will also be presented.