

Public Abstract

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Department:Soil, Environmental & Atmospheric Sciences

Degree:PhD

Title:A STUDY OF ELEVATED CONVECTION AND ITS IMPACTS ON SURFACE WEATHER CONDITIONS

Elevated convection is a vexing phenomenon that causes forecasting problems for both numerical weather prediction systems and human forecasters alike. It is frequently associated with heavy rain and can produce flash flooding. The conducive environment for elevated convection will be explored, with case studies presented, and will be compared to surface based convection. Comparisons of surface impacts (including lightning frequency, rainfall amounts and coverage) will be shown. It was observed during the Program for Research on Elevated Convection with Intense Precipitation (PRECIP) that synoptic warm fronts stalled out when elevated convection formed in an environment rich in downdraft convective available potential energy (DCAPE). Specific examples of this will be shown. It will also be shown that when DCIN was present boundary stalling did not occur. High resolution (3 km) simulations of observed elevated convection cases will be explored and differences in the solutions in which elevated convection caused a boundary to stall, or not stall will be highlighted.