

Regional Correlations between Convective Available Potential Energy and Tornadic Thunderstorms

Andrew White

Western Connecticut State University

Earth & Planetary Science Program

Dr. Albert Owino

September 8, 2011

Abstract

After the first half of 2011, records for tornado occurrences and deaths are being approached or have already been surpassed. Based on this, it is clear that we need to advance our understanding about the atmospheric thermodynamic properties required for the development of tornadoes. One of the atmospheric properties, convective available potential energy (CAPE), provides a numerical value for characterizing instability of the atmosphere, which is one of the required elements for the development of tornadoes. The purpose of this research is to determine if there is a regional threshold CAPE value for which the development of tornadoes is imminent. In order to accomplish this, only occurrences where tornadoes have developed will be studied to mitigate the dependence on other conditions required for tornado formation. CAPE values for each tornadic occurrence will be analyzed to determine if there is a correlation between CAPE and the regional development of tornadoes by locating trends in the regional results. The implications of this research are to further understanding about tornadoes and to increase future predictability, potentially reducing the damages caused by destructive tornadic events.