

Composite Analysis of Significant Severe Weather Day Synoptic Conditions in the NWS Chanhassen, MN County Warning Area

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ABSTRACT

Several local and national studies have been conducted in recent years on synoptic climatology for winter storms. The most notable of these is the Cooperative Institute for Precipitation Studies (CIPS) winter storms analogue project. However, similar undertakings for severe convective events, at least in terms of the MPX CWA, have not been conducted. This presentation will highlight some preliminary research being done into favorable synoptic regimes for significant severe convection days within the MPX CWA, which covers most of southern Minnesota and parts of west central Wisconsin.

To accomplish this, all severe weather reports between 1955 and 2008 within the MPX CWA were compiled. From these reports, significant hail and tornado days were determined. For hail, a day was considered significant when hail one inch in diameter or greater was reported within 3 or more counties from 1955 through 1993, then 5 or more counties from 1994 on. An additional subset of hail days was included that had any day with hail 2 inches in diameter or larger. For tornadoes, any day with an EF2 or stronger tornado or 5 or more sub-EF2 tornadoes was included in the analysis. Once the days of significant severe weather were determined, they were stratified into synoptic pattern archetypes, and composite analyses from these archetypes were subsequently generated using the North American Regional Reanalysis to determine favorable weather patterns for these significant severe weather episodes. These composite charts can in turn be used by forecasters to increase their confidence in the severe potential for a day by matching forecast patterns to those found within the composite charts.