

A FORMAL EVALUATION OF STORM TYPE VERSUS STORM MOTION

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ABSTRACT

In order to predict the location of heavy storm-generated rainfall that could produce flash flooding, forecasters want to know with what velocity a storm will move. However, few systems exist in meteorology where a storm is classified by type, and subsequently, forecast for motion. This publication focuses on identifying the ambient environmental characteristics typical of several types of severe convective storms.

Three types of severe convective storms are examined: supercell, linear, and multicell. Severe storm parameters for each type of system are collected, and ambient winds at critical levels are compiled to obtain a wind profile for eighteen total cases throughout the eastern United States. Previous studies have shown that supercell thunderstorms move with the anvil-level winds; linear storms with the 500-hPa wind; and multi-cellular storms with the lowest level winds. However, the findings of this study show that there is more complexity to predicting storm motion and, in many instances, careful selection of the level(s) of the wind to use is critical. By comparing actual storm motion in the 18 cases to isothermal wind motion at -20, -10, and 0°C, a more definitive correlation of storm type versus storm motion is obtained with less error than previous methods in the field of atmospheric science.