Rainfall-Lightning Ratio Calculations for Elevated Thunderstorms with heave Rainfall in Missouri

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Introduction and Background

Heat and lightning pose a serious threat to the St. Louis area. A recent study conducted by the National Weather Service indicates that heat and lightning pose a threat to the region. The study found that elevated convection events are more likely to produce harmful effects, such as flash floods, than surface-based convection.

Data and Methodology

This study utilized data from the National Lightning Detection Network (NLDN) to examine the relationship between cloud to ground lightning and heat. The data was collected over a period of 20 years and was analyzed using statistical methods.

Mann-Whitney Test Results

The Mann-Whitney test was used to compare the mean rainfall and lightning ratios of elevated and surface-based convection. The results indicate that elevated convection events produced more rainfall and lightning than surface-based convection events.

Example of CG Lightning Flashes plotted over observed rainfall. Green areas are positive CG flashes. Red dashes are negative CG flashes. Arrows indicate locations and times of exceedance of 58.8 mm of average rainfall depth.

Analysis, Results, and Conclusions

- The Mann-Whitney test was used to compare the mean rainfall and lightning ratios of elevated and surface-based convection. The results indicate that elevated convection events produced more rainfall and lightning than surface-based convection events.

Acknowledgements

This work is supported partly by the National Science Foundation under Grant No. 1436734.

References