Public Abstract

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Graduation Term:FS 2015

Department:Soil, Environmental & Atmospheric Sciences

Degree:MS

Title:TESTS OF QUANTITATIVE PRECIPITATION ESTIMATES USING NATIONAL WEATHER SERVICE DUAL-POLARIZATION RADAR IN MISSOURI

The most common, widespread, costly, and dangerous natural disaster in the United States is flooding. Of the numerous types of floods, flash flooding if the most hazardous as it can occur with little or no prior warning. Better flash flood forecasting is therefore necessary in order to more quickly warn the public where and when this threat may occur. The most economical solution to this problem is to use the operational National Weather Service radars already in place to quantitatively estimate precipitation totals. To accomplish this, better rainfall estimation equations are necessary. These equations use radar data as input, and produce the estimated rainfall amount as output. These outputs are then compared to measured rain gauge data, which are considered to be the true measurement of total rainfall. This research uses a statistical approach to determine the error and bias of the radar equations in order to assess which type of algorithm produces the best results, as indicated by bias and error measurements closest to zero. The findings of this body of work are that radar algorithms using a combination of the dual-polarization radar parameters reflectivity and differential reflectivity provide a more accurate estimation of the total amount of rain that has fallen at a given rain gauge site.