KANSAS DEPARTMENT OF TRANSPORTATION

EVALUATION OF NEXRAD OPERATIONAL PRECIPITATION ESTIMATES IN KANSAS

RESEARCH

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Introduction

This report presents two separate evaluations of NEXRAD operational precipitation estimates for Kansas.

Project Description

The first evaluation uses daily gauge data from the National Weather Service (NWS) cooperative network. This gauge network is independent of data used to develop the NEXRAD operational products, and thus provides a realistic assessment of NEXRAD error characteristics. Many studies of NEXRAD error characteristics compare NEXRAD estimates against hourly rain gauge data that were used to produce the multisensory estimates. Results for such studies should be treated with caution, as they likely underestimate the true error characteristics of the NEXRAD product. NEXRAD bias, correlation, and percent detection are mapped across northern Kansas to demonstrate the spatial distribution of NEXRAD errors as compared with daily rain gauge data.

The second evaluation compares NEXRAD estimates of intense precipitation with data from the high-density ALERT network in Johnson County, Kansas. A small number of the ALERT gauges are used at times by the National Weather Service for the production of NEXRAD estimates. As such, the ALERT gauge network is not a completely independent data source. Thirty-four storms over the period 1998 through 2004 were evaluated using this gauge dataset. The ALERT data were spatially interpolated using Kriging techniques prior to comparison with the NEXRAD data.

Project Results

the NEXRAD estimates exhibit better agreement with NWS rain gauges in the eastern portion of the state than they do in the central and western areas. Over the long term, NEXRAD tends to underestimate rainfall across Kansas when compared to NWS rain gauge observations. However, during storms with intense rainfall, NEXRAD often overestimates storm total accumulations when compared to gauge data. The results of this study show marked improvement in NEXRAD estimates of warm season precipitation over the eight-year study period.

Report Information

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