

Development of New Precipitation Frequency Tables for Counties in Kansas Using NOAA Atlas 14

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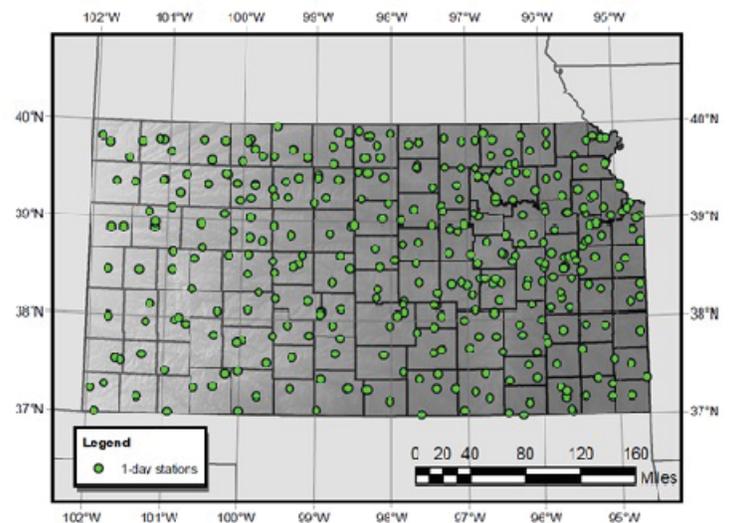
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Introduction

This report documents the development of KDOT's new rainfall tables for counties in Kansas based on NOAA Atlas 14 Volume 8. These new tables provide rainfall depths and intensities for durations from 5 minutes to 24 hours and recurrence intervals from 1 to 500 years. The new tables will replace the KDOT's current rainfall tables. This report also provides an overview of the Atlas 14 products, a summary of the methodology used to develop the Atlas 14 estimates, and guidance for use of the new KDOT rainfall tables.

Project Description

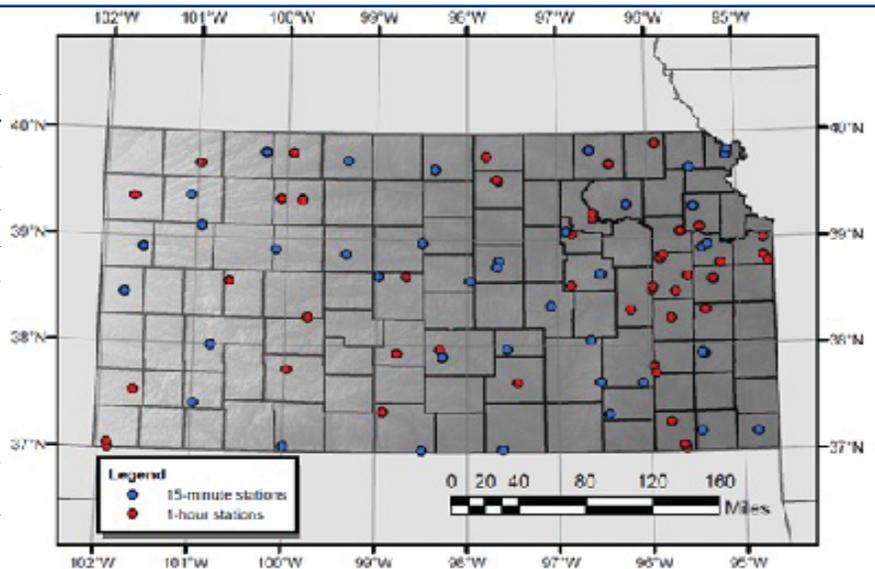
Averaged across Kansas, precipitation estimates have decreased for most combinations of duration and recurrence interval. The changes vary geographically across Kansas. The changes in Johnson, Sedgwick and Finney Counties were examined in detail. The spatial variability of the precipitation estimates has increased considerably. The changes in the precipitation frequency estimates are not necessarily indicative of actual changes in extreme precipitation characteristics. These changes are largely attributable to the improved statistical methodologies used in Atlas 14 compared to TP-40 and HYDRO-35.



Daily Field Stations in Kansas Used in Frequency Analysis

Project Results

The impacts of these changes on design discharges for bridges, culverts and other drainage structures vary by hydrologic method. Design discharges computed with the Rational formula and the Extended Rational equations for Kansas will increase or decrease by the same percentage as the precipitation input to these equations. Discharges computed with the three-variable regression equations for Kansas will increase or decrease by a slightly larger percentage than the precipitation input. Discharge computed with the USGS flood-frequency regression equations for Kansas are unaffected by the changes in the precipitation frequency estimates. Design discharges computed by flood hydrograph simulation will decrease slightly in most cases for most locations in Kansas.



Hourly and 15-Minute Field Stations in Kansas Used in Frequency Analysis

Project Information Contact

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