

Figure 5.23. Twenty-four-hour 2 590-km² PMP percentiles of Knoxville Airport value (meteorological observations made at airport, about 16 km south of Knoxville; Zurndorfer and others, 1986)

to percentages of the value at Knoxville (Figure 5.23). Multiplication of the depth–area–duration values of Figure 5.22 by the percentages of Figure 5.23 yields non-orographic PMP at various locations in the basin.

5.3.3.2 Terrain and orographic influences on PMP

Five indicators of terrain and orographic influence on precipitation were considered in adjusting non-orographic PMP.

Mean annual precipitation was one indicator. A hypothetical mean annual non-orographic precipitation map (not shown) was constructed by eliminating the influence of the Appalachian mountain chain by smooth extrapolation of isolines of mean annual precipitation from surrounding non-orographic regions. This map supports the generalized PMP percentile lines of Figure 5.23.

A chart of 2-year 24-hour rainfalls (Figure 5.24) based on data from some 600 stations in and near the basin was developed. Although index relations based on physiographic factors were not developed to aid in interpolation between stations, topographic maps were used to aid in the analysis. Extreme monthly rains were also plotted and the resultant maps (not shown) analysed to assess terrain effects.

Another indicator of orographic influence was the comparison of the small-basin PMP chart of Figure 5.19 with the chart (not shown) reconstructed under the assumption that the smooth

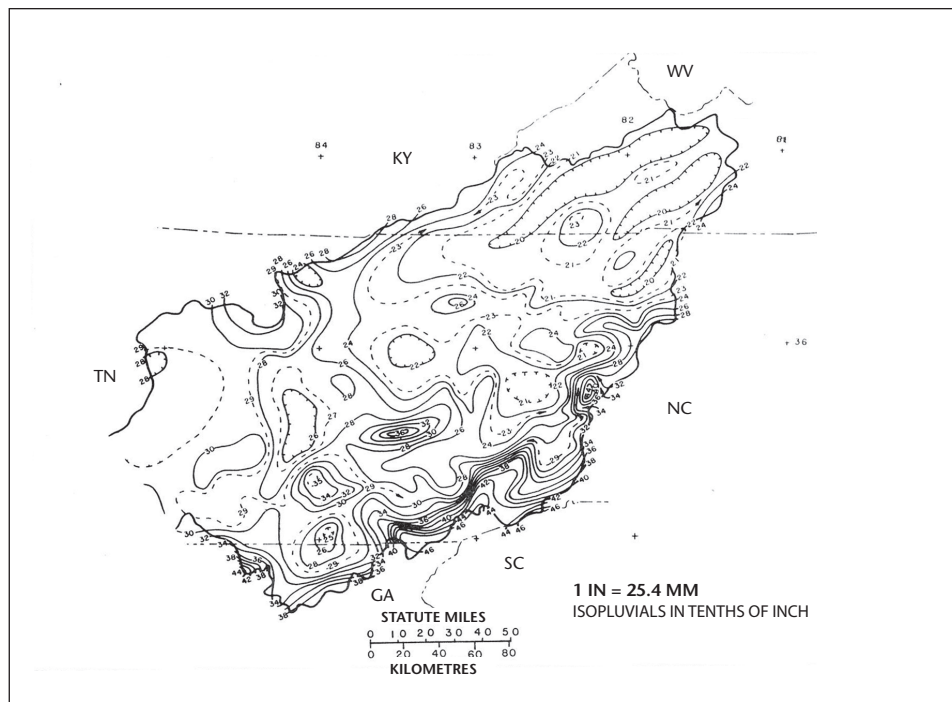


Figure 5.24. Two-year 24-hour precipitation-frequency map (tenths of inches) for eastern Tennessee River basin (Zurndorfer and others, 1986)