classification applied to the entire basin. Non-orographic PMP depth–area–duration values (Figure 5.22) were adjusted by the ratio of PMP index chart values (Figure 5.19) to 6-hour smooth PMP (Figure 5.15) adjusted for basin location (Figure 5.17 or 5.18).

The optimum inflow direction for heavy rains was another index. Over a basin of no more than approximately 259 km^2, it is presumed that the optimum wind direction for unobstructed inflow of moist air and for enhancement by ground roughness prevails during the PMP storm. In larger basins, the optimum direction for precipitation may differ from one part of the basin to another because of varying terrain features. The wind direction most critical for the basin as a whole is defined as the direction that is most favourable over the largest portion of the basin. Figure 5.25 shows the optimum moisture-inflow directions for local areas in the mountainous eastern portion of the region. The largest percentage of a problem basin with the same optimum wind direction is determined from Figure 5.25. An adjustment factor for the optimum wind inflow is related to this percentage value by Figure 5.26, which was developed empirically after a number of PMP estimates for specific basins had been made.

5.3.3.3 Terrain stimulation adjustment

The procedures discussed in sections 5.3.2 and 5.3.3 interface at the 259 km^2 basin size. The estimates for the smaller area are based upon extreme thunderstorm events. Estimates for the larger area sizes are controlled by large-area general storms. If only large-area storms are considered in developing PMP estimates for area sizes just slightly larger than 259 km^2, the PMP amounts will be somewhat underestimated. This results from the exclusion of small-area high-intensity storm events from consideration. Adjustments to the estimates that are derived from large area storms only reflect the terrain classification. Rough and intermediate terrain tends to fix convective cells in one place and cause rainfall amounts to increase. Figure 5.27 shows the terrain classifications for the eastern half of the Tennessee River basin. From this map, the percentage of each basin with the various terrain classifications of rough, intermediate or smooth can be determined. These percentages are used in the nomogram of Figure 5.28 to determine a percentage adjustment for terrain stimulation effects on large-storm rainfall. The adjustments for the rough and intermediate terrain classifications are added to obtain a total terrain adjustment in cases where the basin contains both types of terrain

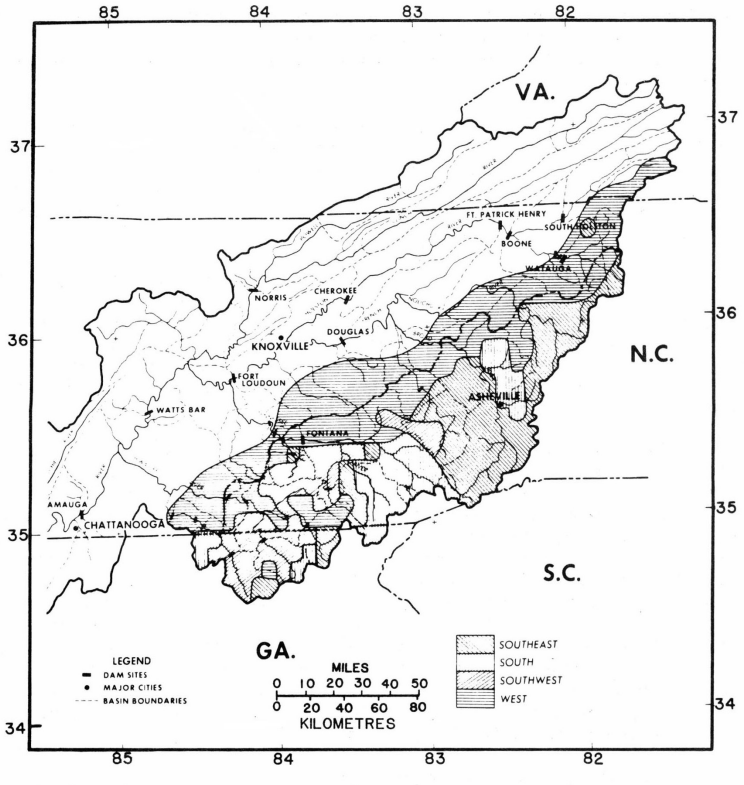

Figure 5.25. Optimum wind directions for heavy rains (Zurndorfer and others, 1986)