

Northern limits were set along a line that coincides with the northern limits of high frequency of nocturnal thunderstorms and also outlines the northern limits of observed storms of this type.

Eastern limits were set at the beginning of the upslopes for the foothills of the Appalachian Mountain chain. East of this line there would be a tendency for the inflow wind to be affected by the beginnings of the Appalachian Mountain chain, thus influencing the storm characteristics.

Southern limits have been set tentatively at the 152-m contour. This line is to the south of all observed storms and the area of high thunderstorm frequency. The exact location of the southern limit is academic, since considerably larger storms of other types have occurred to the south.

#### 2.5.2.5 Adjustments

The final step in transposition is the application of adjustments discussed in the following section 2.6.

## 2.6 TRANSPOSITION ADJUSTMENTS

### 2.6.1 Moisture adjustment for relocation

The moisture adjustment is the observed storm rainfall amounts multiplied by the ratio of precipitable water for the enveloping, or maximum, dewpoint at the transposed location ( $W_2$ ) to the precipitable water for the representative storm dewpoint ( $W_1$ ), or

$$R_2 = R_1 \left( \frac{W_2}{W_1} \right) \quad (2.5)$$

where  $R_1$  is the observed storm rainfall for a particular duration and size of area and  $R_2$  is the storm rainfall adjusted for transposition. Equation 2.5 incorporates both a transposition adjustment and a moisture maximization. The DAD array of storm rainfall values (Table 2.2) is multiplied by this ratio. Values such as those given in Table 2.2 must be determined separately for each storm, using the appropriate procedures for determining such data (WMO-No. 237). These values should be adjusted for a range of areas from storm-area sizes less than the area of the basin to those exceeding the basin size (see sections 2.8.2, 2.9, and 2.13.4). The moisture adjustment may be either greater or less than unity, depending on whether the transposition is toward or away from the moisture source and whether the elevation of the transposed location is lower or higher than that of the original storm site.

#### 2.6.1.1 Reference dewpoint for moisture adjustment

For reasons given in section 2.2.4, dewpoints between the rain area and moisture source tend to be more representative of the atmospheric moisture content, or precipitable water, flowing into the storm than dewpoints within the rain area. Such representative dewpoints may be a few hundred kilometres away from the storm centre. In maximizing for moisture, the maximum dewpoint used is for the same location as that of the representative storm dewpoint. In transposing, the same reference distance is laid out on the same bearing from the transposition point (Figure 2.7). The referenced dewpoint location is then used to obtain the maximum dewpoint from the maximum dewpoint chart

**Table 2.2. Maximum average depth (mm) of rainfall in 20–23 May 1927 storm**

Area (km <sup>2</sup> )	Duration (hours)							
	6	12	18	24	36	48	60	72
25 <sup>a</sup>	163	208	284	307	318	328	343	356
100	152	196	263	282	306	324	340	353
200	147	190	251	269	300	321	338	352
500	139	180	234	250	290	315	336	351
1 000	133	171	220	235	278	304	328	341
2 000	124	160	202	215	259	284	308	322
5 000	107	140	172	184	218	241	258	274
10 000	91	118	140	151	182	201	215	228
20 000	66	87	104	114	143	158	173	181

<sup>a</sup>Assigned area for maximum station precipitation.