for all stations around the basin were plotted and the topography examined. There were ten "close-in stations" characterized by topographic settings similar to the three categories that were characteristic of the basin. The elevations used to separate these were the same as those used within the basin. Variations of both the convergence precipitation from the map of the Figure 5.42 and total precipitation values determined for the individual stations were adjusted to the elevation of the centroid of each of the topographic classifications. Using these values, a weighted value for T/C of 1.13 for the 24-hour duration is determined for the basin.

To obtain values of T/C for durations other than 24 hours, data from other regions were used. Regions were selected where the 100-year 24-hour and 6-hour precipitation-frequency values had been analysed, the value of T/C based on the 100-year 24-hour amounts was 1.13, and the region was at approximately the same latitude and distance from the moisture source as the Johns Creek basin. In addition, the topography was selected to be, as near as possible, comparable with that around Johns Creek and the three proxy regions. The locations selected were in the foothills of the front range of the Rocky Mountains in Colorado and northern New Mexico. There were some differences in the climatology of rainfall between Johns Creek and the three regions and also some difference in topographic settings. However, the storm types which produced the PMP for this area size are similar in these two regions. For these locations, a value of T/C for 6 hours of 1.11 was determined. As the duration decreases, the value for T/C should approach 1. Using this assumption and the values of T/C for 6- and 24-hour values of T/C for the durations between 1 and 72 hours were determined. These values are shown in Table 5.4.

5.3.6.2 Storm intensity factor *M*

The storm intensity factor is related to the length of the core event (the period of most intense precipitation) during the PMP storm (see section 5.3.4.3). Examination of the major storms in the regions surrounding the Johns Creek drainage (Fenn, 1985) suggests the length of the core event r for some durations is slightly different from those found in other regions for some durations (Miller and others, 1984*a*, 1984*b*). The duration of r, for selected total periods of precipitation h is shown in Table 5.5. The storm intensity factor M is the ratio of the precipitation during the period r to the precipitation during h. These precipitation amounts are the non-orographic PMP values read from the maps of the generalized study for the region (Schreiner and Riedel, 1978) for an area size approximately that of the basin. The values of M computed from these values, and thus appropriate to the Johns Creek basin, are shown in Table 5.6.

5.3.6.3 Computation of PMP for Johns Creek basin

The procedure used to compute the total PMP for the Johns Creek basin is the same as that used for the orographic region between the Continental Divide and the 103rd meridian. The procedure uses Equation 5.1, shown in section 5.3.4.4. The equation was developed considering only the relationships between atmospheric forces and orographic effects. It should be generally applicable where the climatic regime, storm types, and topography are not completely dissimilar to the mid-latitude United States. The only requirement would be to develop the orographic factor T/C and the storm intensity factor M using the relations for major storms within the region. In this study (Fenn, 1985), the convergence precipitation adjusted for depletion in moisture availability and for the orientation and basin shape of the Johns Creek basin with the T/C and M factors discussed in the preceding two sections produces total PMP values shown in Table 5.7. These values are also shown in percentages of storm-centred PMP determined directly from the generalized or regional study (Schreiner and Riedel, 1978) for the area size of the basin. The combined effect of orographic intensification and reduction for the barrier to moist air inflow and non-concurrence of the elliptical isohyetal pattern with the basin shape results in a small decrease from the results taken directly from the generalized study. With other basins, the combined effect could be different and the net result could be an increase or an even larger reduction.

5.3.7 Generalized estimation of PMP for local storms in the Pacific North-west region of the United States

5.3.7.1 Brief introduction

A small-area, short-duration storm may be the centre of a large-area precipitation or an isolated event independent of a large-area precipitation. The former is called a non-local storm and the latter a local storm. The definition of local storm in this section is a storm with a duration less than 6 hours and an area less than 1 300 km^2 that has nothing to do with a large-area storm. Extreme local storms in the Pacific North-west region of the United States are atmospheric convergence phenomena and are mostly