(Figure 5.64). If the required duration cannot be determined directly from Figure 5.64, values for durations from 0.5 hours to 6 hours are plotted on a semi-logarithmic graph and interpolated using the curve of best fit drawn to the data.

(d) Reduction factor for the location of the basin is determined (Figure 5.65).

(e) A reduction factor of 5 per cent per 300 m for elevations above 1 500 m is applied.

(f) If seasonal values are needed for a catchment smaller than 500 km^2 and located south of 30° S, an adjustment factor from Figure 5.67 is applied.

(g) If an isohyetal pattern is needed, the procedures discussed in section 5.4.3.3 are applied.

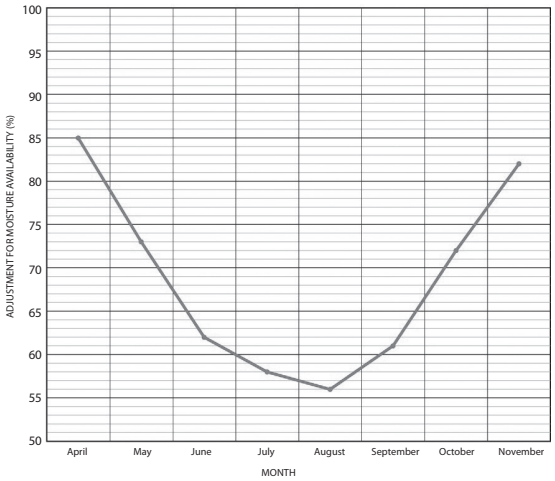

Figure 5.68. Monthly percentage moisture adjustment for southern Australia (south of 30° S); areal limit is 500 km^2.

5.5 ESTIMATION OF PMP FOR LONGER-DURATION STORMS IN AUSTRALIA

5.5.1 Introduction

There are two generalized methods of PMP estimation for use with longer-duration storms in Australia: the generalized south-east Australia method (GSAM; Minty and others, 1996) and the revised generalized tropical storm method (GTSMR; Walland and others, 2003). Figure 5.69 shows the boundaries between the application regions of the methods. A novel approach was applied in Australia that simplifies the generalization and implementation processes by taking advantage of an Australia-wide rainfall intensity–frequency–duration database (Institution of Engineers, Australia, 1987) as well as advances in computing technology. This approach vastly simplifies the parametrization of the effect of orography on rainfall and is easily applied if such intensity data is available in the region of interest.

The hydrometeorological section of the Australian Bureau of Meteorology first embarked on the development of the GSAM (Minty and others, 1996) for regions not influenced by tropical storms. The methods and procedures used in the development of the GSAM were then applied to storms of tropical origin, superseding the previous approach of Kennedy and Hart (1984). The revised method was completed in 2003 (Walland and others, 2003).

Both methods follow the same basic approach. As generalized methods, they are founded on a thorough historical search of storm data in the relevant parts of the continent over the available record. In Australia, some 100 years worth of data were searched and around 100 significant rainfall occurrences were selected for use with each of the generalized methods. A database of this size allows sampling storms of a large variety of durations and extents in a wide variety of locations. The location-specific components of each individual storm were then identified and removed, allowing the modified storm to be freely transposed across relevant regions and enabling the enveloping of the storm data.

As shown in Figure 5.69, generalized PMP methods are now available for all regions of Australia except the west coast of Tasmania.

5.5.2 Establishment of the storm database

5.5.2.1 Storm selection

When searching for historical rainfall data, sources such as (a) published reports including: storm descriptions, tropical cyclone reports, lists compiled for other projects, and flood damage reports; (b) previous PMP studies; and (c) computerized searches of the rainfall archive, were utilized. Procedures were developed to interrogate the Australian Bureau of Meteorology rainfall archive and extract data for all the rainfall-recording stations within defined regions. The data were ranked according to the highest falls and examined to determine whether the high rainfall totals were widespread. In addition, rainfall totals were compared to the 72-hour 50-year rainfall intensity (Institution of Engineers, Australia, 1987) at the station location. This assisted the storm ranking, as it gave a measure of the rarity of an event at its location.