show the scale, a scale in kilometres, a latitude–longitude grid, and boundaries of states, provinces districts and countries.

5.2 ESTIMATES FOR NON-OROGRAPHIC REGIONS USING GENERALIZED MAPS

Estimates in non-orographic regions are prepared in the same manner as described in Chapter 2. The basic procedures are moisture maximization, transposition, and smoothing (envelopment) of observed storm rainfalls. Moisture maximization of observed storm precipitation adjusts individual storm amounts to their maximum potential. Transposition procedures are used to expand the storm data base and are either to a series of grid points or to the explicit storm transposition limits of the major storms in the region. In either case, depth–duration, depth–area, and regional smoothing of individual analyses are required to develop a consistent set of PMP maps.

5.2.1 Moisture maximization

The maximum atmospheric moisture available for storm maximization throughout a region is an important requirement for the development of generalized charts of PMP. For reasons given in section 2.2, maximum persisting 12-hour 1 000-hPa dewpoints are used as indices of the maximum amount of atmospheric water vapour available for maximizing storms. Generalized charts of these dewpoints (Figure 2.4) are therefore required for making the various adjustments involved in developing generalized PMP estimates. Details on the development of the charts and procedures used in moisture maximization calculations are given in sections 2.2 and 2.3, respectively.

5.2.2 Storm transposition

Storm transposition (section 2.5) plays an important role in the preparation of generalized PMP estimates. In any large region there are many areas that have not experienced or recorded outstanding storms of the magnitude observed in adjacent areas or elsewhere in the region, and transposable storms are adjusted to conditions in these deficient areas to supplement the inadequate record of major storms.

In estimating PMP for a specific basin, comprehensive meteorological analyses of major storms are made to determine whether the storms are transposable to the basin. The storms considered transposable are then adjusted as required by the geographic features of that particular basin. In the preparation of generalized PMP charts, the boundaries, or limits, of the area of transposability (Figure 2.5) of each major storm are delineated. Each storm is then transposed within its area of transposability to locations indicated by grid points on a suitable base map (section 5.1.1) or to the boundaries of the area, or both. Transposition to grid points has the advantage of allowing ready comparisons between rainfall values from different storms. Transposition to storm limits has the advantage of determining transposed values at the limits of explicit transposition. If the grid point procedure is used, a particular grid point may be just beyond transposition limits. This may result in an underestimate at this point. If transposition to storm limits is used, the problems of discontinuities between adjacent locations are minimized.

Transposition of a storm from its place of occurrence to another location involves adjustments for differences in geographic features of the two locations (section 2.6). The need for elevation adjustment is minimized if the transposition limits are so delineated that differences in elevation greater than 300 m within the area of transposability are avoided. When this is done, the elevation adjustment discussed in section 2.6.2 is generally omitted.

5.2.2.1 Storm transposition techniques

Once a suitable base map has been selected, it is necessary to select the system to use for portraying transposed storm values on the base map. Two systems have been used. The first uses a grid system over the region. The second uses the explicit storm transposition limits as a basis.

5.2.2.1.1 *Grid system*

If transposition to grid points is preferred, the points are usually selected to conform with the latitude–longitude grid of the map. The points formed by the intersections of the grid lines (which actually do not have to be drawn) indicate the locations to which the maximized storms are transposed and the maximum values plotted. Enough maps are prepared so that there are maps for a representative number of area sizes and durations, the number depending on the range in area sizes and durations of PMP values to be displayed. For example, one map may be used for developing and displaying 6-hour PMP for 100 km^2 areas, another for the 24-hour PMP over 1 000 km^2 areas, and so forth. Regardless of the number of maps required, the use