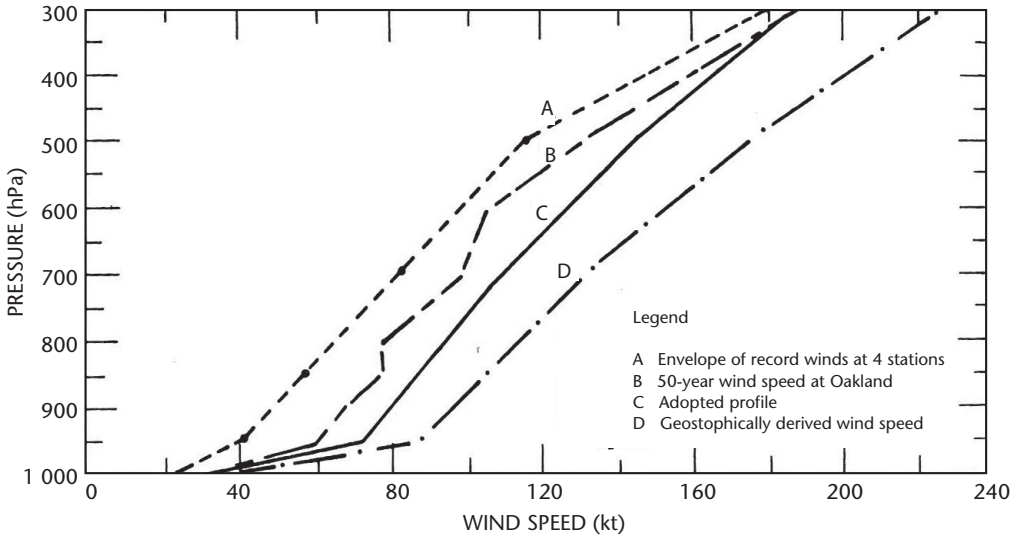

Figure 3.7. Maximum 1-hour wind profile and supporting data (United States Weather Bureau, 1961*b*)

3.3.1.2 Maximum moisture

Maximum values of moisture are obtained from maximum persisting 12-hour 1 000-hPa dewpoints. A full discussion of these dewpoints is given in section 2.2.

3.3.2 Generalized estimates of orographic PMP

One method of applying the model for developing generalized estimates of PMP is to define terrain profiles over the entire region of interest. If the topography is relatively uncomplicated and all general windward slopes face one most critical moisture-inflow direction, as in the California Sierra Nevada, application of this procedure presents no special problems.

An alternative method is to use the model to compute PMP for selected terrain profiles and to evaluate PMP between them by means of maps, such as mean seasonal, annual precipitation or precipitation-frequency maps, which adequately depict the geographic distribution of precipitation. In this approach, it must be shown first that there is good correlation between computed orographic PMP on the selected computation profiles, or areas, and the values indicated by reference maps used for interpolation.

A somewhat different approach was used (United States Weather Bureau, 1966) for regions where the optimum moisture-inflow direction and orientation of slopes varied from place to place. The procedure consists of computing PMP for terrain profiles oriented in different directions and then enveloping the greatest values regardless of inflow direction or slope orientation. Relations are then developed for adapting the envelope values to inflow directions and slope orientations critical for a specific basin. A simple but adequate method for making such adaptations is to use a variation with basin size, since the variety of optimum inflow directions and slope orientations tends to increase with size of area. This type of adjustment was used in a study for the northwestern United States (United States Weather Bureau, 1966). In the California study (United States Weather Bureau, 1961*a*), the adjustment was based on the decrease of moisture with increasing width, or lateral extent, of inflow in observed major orographic storms (section 3.3.3.3).

Generalized estimates of PMP are usually presented on an index map showing isohyets of PMP for a particular duration, size of area and month. Relations are then provided for adjusting the mapped PMP values to other durations, basin sizes, and months.

Figure 3.9 shows the January 6-hour orographic PMP index map developed in the aforementioned California study. This particular map does not specify an area size. In this case, the average index value for any specified basin is obtained by laying an outline of the basin on the index map and then estimating the average of the values within the outline. No further areal adjustment is required unless the width of the basin exposed or normal to the optimum moisture inflow exceeds 50 km (section 3.3.3.3).