schematic diagram of the final separation into sub-regions is shown in Figure 5.37. An example of the depth–area relation for the orographic portion of the Missouri and Yellowstone River basins is shown in Figure 5.38.

5.3.5 PMP estimates for the Colorado River and Great Basin drainages of the south-western United States

Estimation of PMP in this region of the south-western United States (Hansen and others, 1977) used the orographic separation method (section 3.1.6). First, essentially non-orographic or convergence PMP was estimated from major convergence storms in non-orographic portions of the region. Orographic PMP was then determined.

In this region, the laminar flow model discussed in section 3.2.2 is inappropriate. Along the west coast of the United States, where the laminar flow model has been applied (United States Weather Bureau, 1961*a*, 1966), the mountains form an almost unbroken barrier to windflow. One of the major causes of rainfall along the western coast of the United States is the lifting of moist stable air over this barrier. There are also a large number of representative rainfall measurements available for calibrating the model. In the Colorado River and Great Basin drainages moisture transport into the region involves air with greater instability than along the west coast, and the orographic model with its assumed laminar flow has only very limited applicability. Much of the rainfall in major storms in this region results in the initiation of convective activity, including thunderstorms, along the mountain slopes. The terrain also is much more complex, with short mountain ridges that present various aspects and thus angles to the inflow winds. Because of these factors, the orographic wind flow model has very limited use.

The orographic precipitation estimates were based on variations in observed precipitation and terrain effects. The development of the convergence precipitation estimates in this region was completed in a manner similar to that for California and discussed in section 3.3.4. It will not be repeated in this chapter. Since the development of the orographic component of the precipitation uses indirect procedures, a brief description will be given.

5.3.5.1 Orographic precipitation index

The initial estimate of the orographic component of PMP over the Colorado River and Great Basin (Hansen and others, 1977) was based on the

Table 5.3. Major river basins within the region of the central United States between the Continental Divide and the 103rd meridian used for depth–area relations

Sub-region	*River basins*
A	Missouri and Yellowstone rivers
B	North Platte River
C	South Platte River
D	Arkansas River and Upper Rio Grande
E	Pecos and Canadian rivers and middle Rio Grande

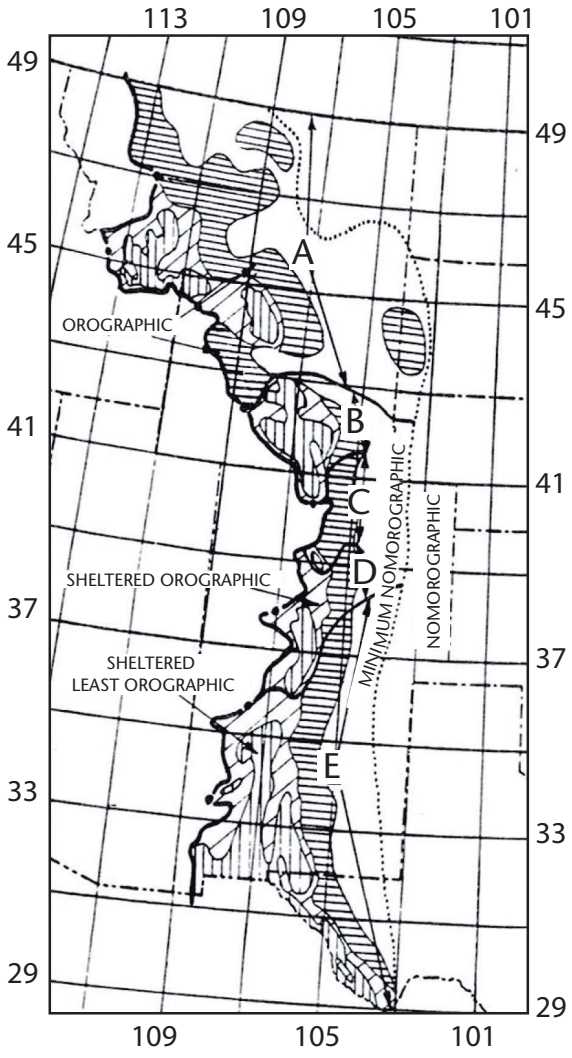

Figure 5.37. Schematic diagram of the sub-regional system used in developing depth–area–duration relatons (Miller and others, 1984*b*)