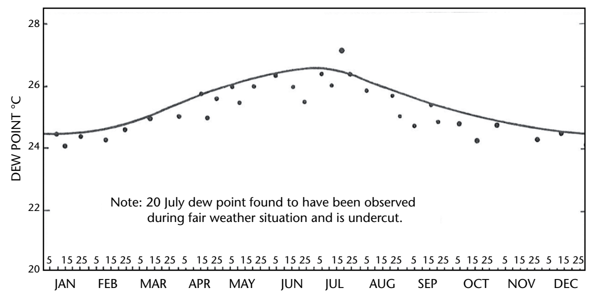

Figure 2.3. Enveloping maximum persisting 12-hour dewpoints at a station

Some regions have no dewpoint data, or a period of record so short as to preclude reliable frequency analysis. In these instances, sea-surface temperatures provide a logical base for estimating maximum dewpoints since the chief source of moisture inflow into major storms is water evaporated from the seas or oceans. Sea-surface temperatures may be more representative of atmospheric moisture than inland dewpoints that are affected by local conditions hence may not be representative of the total moisture column.

Estimation of maximum dewpoints from sea-surface temperatures is relatively simple for coastal regions since there is little modification of the moist air by passage over land surfaces. In the coastal regions of the Gulf of Mexico, for example, maximum persisting 12-hour 1 000-hPa dewpoints range from about 1°C to 2°C below upwind, offshore mean-monthly sea-surface temperatures. The difference increases with distance inland. In Australia, extreme coastal dewpoints are about 4°C below extreme upwind sea-surface temperature values.

The rate of decrease of maximum dewpoints with distance inland depends upon the season of the year, direction of moisture flow during periods of maximum humidity, topographic barriers, and other geographic factors. The decrease must be determined for each month and for each region of interest in order to obtain a reasonably reliable seasonal variation curve. The gradients indicated by maps of maximum persisting 12-hour 1 000-hPa dewpoints prepared for areas with adequate data provide the most useful guidance in determining such dewpoints for areas with very little or no data. Portions of the map of Figure 2.4, for example, would be useful for estimating gradients of maximum persisting dewpoints for other regions of similar geography.

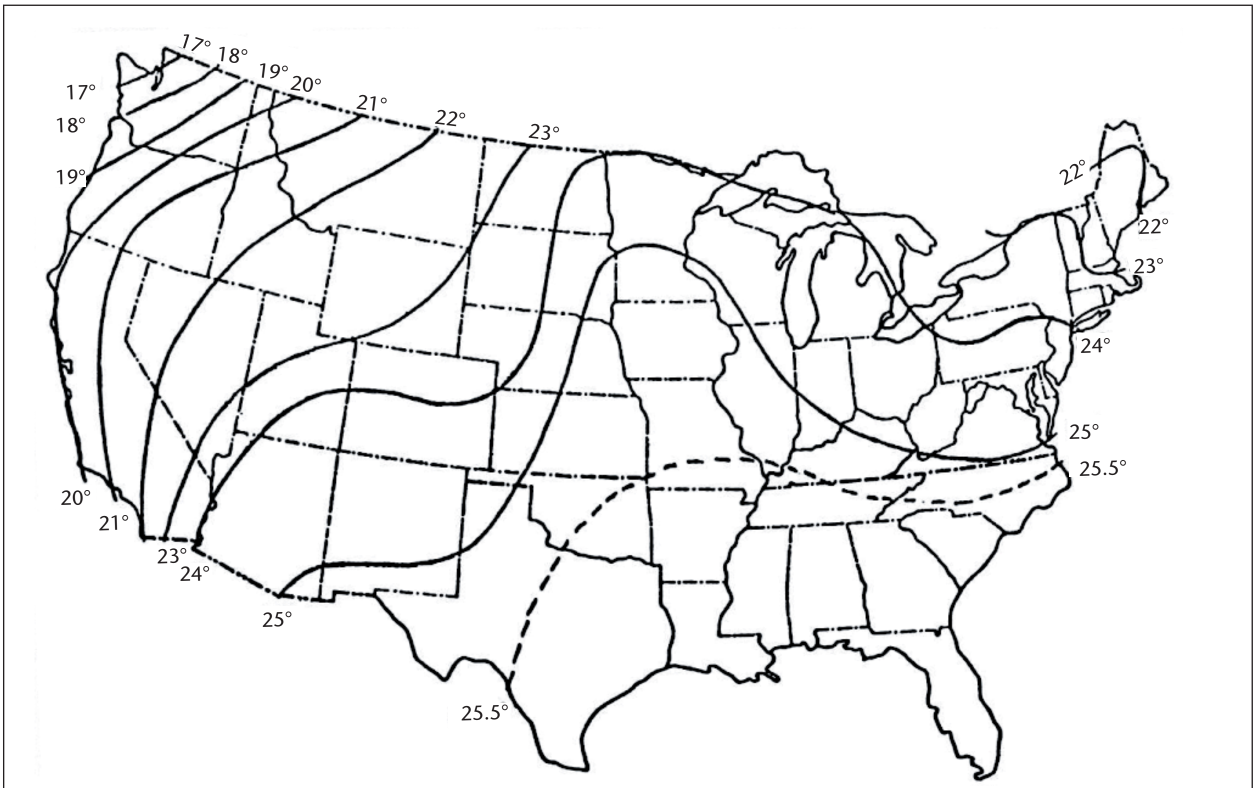

Figure 2.4. Maximum persisting 12-hour 1 000-hPa dewpoints for August (Environmental Data Service, 1968)