The hydrological models used for forecasting use measurements of the rainfall over the catchment and produce estimates of future river flows. The rainfall data have to be particularly detailed because the rate of rainfall varies greatly from time to time and from place to place. Usually, a network of telemetering rain-gauges is used to collect the data automatically and to transmit it to a central site, either by land-line or by radio. Radar is also used to estimate the rainfall over an area. The radar beam is reflected off raindrops and the intensity of the reflection gives a measure of the rate of rainfall. Unfortunately, the reflection also depends on other factors, including the size of the raindrops, and radar rainfall measurements have to be continuously calibrated by comparison with the telemetering rain-gauge network. Radar is capable of giving a detailed picture of the variation of rainfall over an area and successive radar images can be combined to show the movement of the rainstorm. Computer analyses of the movement can be used to provide a short-term forecast (a few hours ahead) of the rainfall.

Once all the data have been received at the forecasting centre they are checked and can be displayed and used to run the forecasting model. The results of the model calculations will give forecast flows and levels at the selected sites for a short period ahead. This can only be a short period because the direct runoff, by far the largest component of the flood, will have left the catchment in a few hours and the time this takes, called the «time of concentration» of the

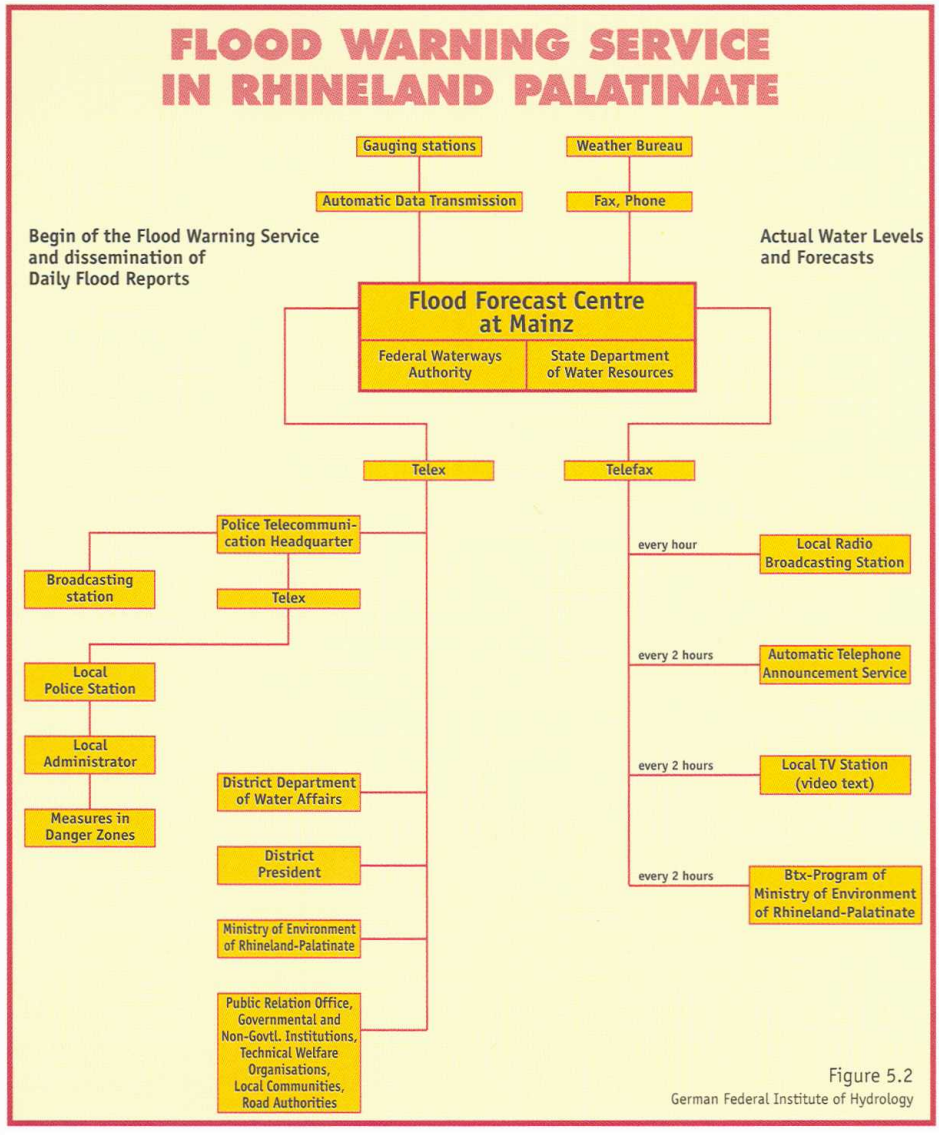

Figure 5.2
German Federal Institute of Hydrology