

## 6.8 Calibration

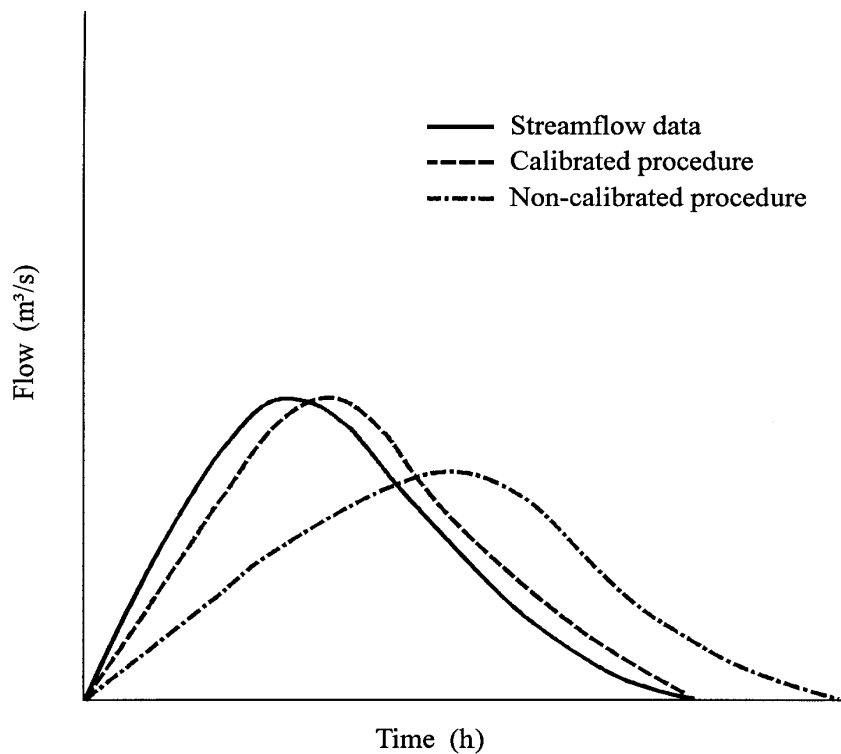
### 6.8.1 Definition

Calibration is a process of varying the parameters or coefficients of a hydrologic method so that it will estimate peak discharges and hydrographs consistent with local rainfall and streamflow data.

Figure 6-1 is an illustration of a hydrograph resulting from flow data as compared to a hydrograph resulting from using a non-calibrated and calibrated hydrologic procedure. It can be seen that the calibrated hydrograph, although not exactly duplicating the hydrograph from streamflow data, is a much better representation of the streamflow hydrograph than the non-calibrated hydrograph.

### 6.8.2 Hydrologic Accuracy

The accuracy of the hydrologic estimates will have a major affect on the design of drainage or flood control facilities. Although it might be argued that one hydrologic procedure is more accurate than another, practice has shown that all of the methods discussed in this chapter can, if calibrated, produce acceptable results consistent with observed or measured events. What should be emphasized is the need to calibrate the method for local conditions. This calibration process can result in much more accurate and consistent estimates of peak flows and hydrographs.



**Figure 6-1 Calibrated Hydrograph**

### 6.8.3 Calibration Process

The calibration process can vary depending on the data or information available for a local area.

1. If streamflow data are available for an area, the hydrologic procedures can be calibrated to these data. The process would involve generating peak discharges and hydrographs for different input conditions (e.g., slope, area, antecedent soil moisture conditions) and comparing these results to the gaged data. Changes in the model would then be made to improve the estimated values as compared to the measured values.
2. After changing the variables or parameters in the hydrologic procedure the results should be checked against another similar gaged stream or another portion of the streamflow data that were not used for calibration.
3. If some local agency has developed procedures or equations for an area based on streamflow data, general hydrologic procedures can be calibrated to these local procedures. In this way the general hydrologic procedures can be used for a greater range of conditions (e.g, land uses, size, slope).
4. The calibration process should only be undertaken by personnel highly qualified in hydrologic procedures and design.
5. Should it be necessary to use unreasonable values for variables in order for the model to produce reasonable results, then the model should be considered suspect and its use carefully considered (e.g., having to use terrain variables that are obviously dissimilar to the geographic area in order to calibrate to measured discharges or hydrographs).