



STREAMFLOW CHARACTERISTICS OF THE TRUCKEE AND CARSON RIVER SYSTEM

This plate shows some of the basic characteristics of streamflow for 17 principal gaging stations on the Truckee and Carson Rivers (see table). For each of 14 stations where data permit, a pair of hydrographic diagrams show data for ready comparison among stations and an overall perspective on the basins. The three-dimensional diagrams show the mean flows by month for the period of record indicated. The width of the plots is scaled to the average annual flow for that same period. The two-dimensional plots each show year-by-year variations in three significant streamflow characteristics. The vertical lines indicate the instantaneous peak flow for the given year. The upper connected line (blue) indicates the average discharge for the 30 consecutive days of highest flows each year for the periods when these data were available. Similarly, the lower connected line (red) indicates the average discharge for the 30 consecutive days of lowest flows each year. Values less than 10 cubic feet per second (CFS), are not shown. The green line represents the average annual flow.

The data used to compile these plots is readily available to requestors through the WATSTORE Data File and related programs explained on page 64 of the accompanying text. In preparation for producing a flow model, the data are being used to generate synthesized flows for many of the gaps shown on the plots. The computation of these flows will then lead to a continuous data base for comparative studies for many studies, and facilitate hydrologic studies in the future.

The diagrams illustrate several similarities and differences between the two rivers. The similarities arise from the natural patterns in precipitation and runoff, and downstream patterns of water use. The differences relate to the degree to which each river is regulated by dams. For example, the highest peak flows occurred during the same years at most stations. This suggests that the precipitation affected the entire study area at approximately the same time. Specifically, regional flooding occurred when warm rains of mid-to-late winter storms fell on and partly melted the existing snowpack.

Drought also affected the entire area during the same periods, but the plots for the Truckee River look different

from those of the Carson River because of reservoir regulation on the Truckee. At Truckee River at Farad (10337500), reservoir storage moderates the effects of minor drought so that only the most severe low-flow periods are indicated. In contrast, the plot for the Carson River near Carson City (10311000) shows the variability in low flows typical of the unregulated system. The persistence of drought on the Carson River is better indicated by the 30-day mean high flow trace that shows the major flow deficiencies in 1928-50 and 1976-77.

The plot for the Carson River near "Foot" Canyon (10312000) for example, suggests that there is no long-term climatic trend apparent in the 68 years of record. That is, the unregulated system shows no apparently consistent tendency toward either higher or lower flows. Plots for the Truckee River at Farad, Reno, and Vista show the tendency of reservoir operations to maintain low flows at their annual low flows. Although subtended, a similar pattern exists for the Truckee River at Tahoe City (10337500). There, storage is attempted during the spring runoff season for later release for summer use downstream. A more detailed account of reservoir operation on the rivers is given in the accompanying text (p. 32).

Water uses from Lahontan Dam downstream result in a significantly different pattern of mean monthly flows. Water is stored in Lahontan Reservoir during the winter and early spring, then released throughout the summer irrigation season. Thus, the highest flows occur downstream from the reservoir while the rivers upstream are receding to their annual low flows. Although subtended, a similar pattern exists for the Truckee River at Tahoe City (10337500). There, storage is attempted during the spring runoff season for later release for summer use downstream. A more detailed account of reservoir operation on the rivers is given in the accompanying text (p. 32).