Long-term trends in streamflow can be indicators of climate change and variability. Previous studies of mean annual streamflow in the Missouri River Basin indicate statistically significant decreases in the western part of the basin and increases in the eastern part over the last 50 years. Trends were further explored from 1950-2007 at three streams that are part of the U.S. Geological Survey’s Hydro-Climatic Data Network: Cheyenne River at Edgemont, SD; Yellowstone River at Billings, MT; and James River near Scotland, SD (central, western and eastern parts of the basin, respectively). Patterns were examined for annual peak flows and flows exceeding the 2-year recurrence interval (RI). The Cheyenne River had a marked decrease in the volume of water conveyed by floods. From 1950 to 1980, 20 peak-flow events exceeded the 2-year RI and conveyed 763,000 acre-feet. From 1981 to 2007, eight such events conveyed 134,000 acre-feet. During 1950-1970, the annual peak flows occurred between May and August. Since 1970, annual peak flows occurred between February and September. The Yellowstone River had 19 peak flows exceeding the 2-year RI prior to 1980 that conveyed 16,300,000 acre-feet, and 10 such events since 1980 conveyed 9,160,000 acre-feet. The James River showed increasing volumes conveyed by floods. From 1950 to 1980, the 13 peak flows exceeding the 2-year RI conveyed 4,610,000 acre-feet, and 16 events after 1980 conveyed 13,400,000 acre-feet. The change in frequency of channel shaping flows and volume of runoff will, over time, change the geomorphic nature of these streams and rivers.