

Changes in Monthly Streamflow Conditions in the Missouri River Basin from 1957 to 2007

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Observations of 51 years of continuous record at about 202 U.S. Geological Survey stream gages indicate that streamflow conditions are changing in the Missouri River Basin (MRB). Where trends are significant, they are generally upward in the eastern portions of the basin and downward in the western parts of the basin. Eighty-four streamflow stations out of 202 streamflow stations demonstrate a significant trend in annual flow (25 upward and 59 downward) at the 95-percent confidence level. The reduced runoff in the western basin has resulted in the need for main-stem reservoirs on the Missouri River to operate at less than full capacity for most of the last decade. Lower reservoir levels have reduced hydropower revenues and recreation opportunities. Streamflow timing or seasonality merits careful examination because of reservoir management, water supply strategies, and ecological ramifications. In this study, we examine streamflow trends by month within the MRB for the period 1957 through 2007. For the 84 stations with annual trends, the month of January has the most stations (67) with upward trends, followed by December (60). The month of March has the fewest stations (18) with upward trends. The months of June (57) and September (56) have the most stations with downward trends, while May has the fewest stations with downward trends (21). Only 6 percent of the stations had months with both upward and downward trends.