

IS FLOODING GETTING WORSE IN NEW JERSEY? AN ANALYSIS OF TEMPORAL TRENDS IN FLOOD FLOWS

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Flooding is a severe and reoccurring problem throughout New Jersey. Most climate models suggest that flooding will become more severe and/or frequent; indeed, this perception that this is already occurring is common in the populace. To test this perception we calculated flows associated with various frequencies of occurrence (i.e., the 2, 5, 10, 20, 50 and 100-year flows) for 53 USGS-operated streamflow gages distributed throughout New Jersey (including 18 in the Passaic-Hackensack basin) using the flood frequency analysis software HEC-FFA. The record of length varied from 50 to 108 years, and moving 30-year blocks of measured annual peak discharges were analyzed per gage. The number of gages with statistically significant linear increase/decrease (F-test p-value <0.05) was calculated for each frequency of occurrence. To examine whether urbanization was a possible factor in the increase in flood flows, the analysis included basins which were never developed and presently have low amounts of impervious landcover.

The percent of gages showing significant increases vs. decreases ranged from 72% vs. 11% for the 2-year flow to 38% vs. 11% for the 100-year flow. The median rate of change was approximately +0.75% per year for all return periods.

According to this analytical method, it appears that flood flows associated with a given return period have indeed increased at a substantial percentage of streamflow gages in New Jersey.