

# INVESTIGATION OF TRENDS IN BASEFLOW IN NEW JERSEY STREAMS AND THEIR CORRELATION WITH IMPERVIOUSNESS

Kirk R. Barrett, Joshua C. Galster, and Seth Xeflide

Passaic River Institute and Department of Earth and Environmental Studies, Montclair State University, 1 Normal Ave, Montclair, NJ 07043, 973-655-7117, kirk.barrett@montclair.edu

Annual baseflow at 53 stream gages across New Jersey was analyzed to identify possible trends and if trends were correlated with extent of tributary impervious land cover in a gage's watershed. Different timeframes and baseflow metrics were assessed for their utility in identifying trends. We analyzed three measures of annual baseflow (baseflow per unit drainage area, BF), ratio of BF to precipitation; BF fraction of total flow and the minimum annual daily average flow per unit drainage area, included as a potential surrogate of baseflow. Blocks of years analyzed ranged from the most recent 10 years (ie, 1996 to 2005) to the last 60 years (1946 to 2005). Trends were assessed using the non-parametric Mann Kendal statistical test. Consistency of the results for the four metrics was investigated by calculating the rate of "disagreement", i. e., trend at a specific gage in one metric but not in another.

A correlation was determined between current population density and current imperviousness for each gage's watershed. Historical imperviousness was then estimated using historical population density in each watershed. Trends in stable watersheds (little to no increases in imperviousness) were compared to trends in urbanizing watersheds (large increases in imperviousness).

Also, for each gage, annual baseflow metrics were plotted against concurrent imperviousness to assess correlation between the two variables.

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