

Do Monthly to Inter-Annual Rainfall Patterns Affect the Abundance of Sewage Bacteria in the Hudson River (NY,USA)?

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The Hudson River is an essential contribution to life in New York City. It is home to multiple species, and is frequently polluted by sewage bacteria, such as the enterococci. Enterococci are sewage indicator bacteria, that are usually found in the gastrointestinal tract of warm-blooded animals. Enterococci are often released into the marine environment from combined sewer outflows and land runoff following precipitation. Knowledge of when sewage bacteria will be abundant in the Hudson River is useful in predicting and preventing the infection and spread of pathogenic bacteria carried with sewage. Rainfall commonly triggers a short-term (3-4 day) increase in enterococci in the Hudson. The purpose of this research is to determine if longer-term (monthly to annual) rainfall patterns in the Hudson River watershed can predict the geometric mean of enterococci in the Hudson River. Precipitation data from the past thirteen years was collected from 3 locations along the Hudson River (Poughkeepsie, Albany and New York, NY), and compared with enterococci count data collected over the same time period. We found that the enterococci geometric mean (calculated for the entire stretch of river from Albany to New York, NY) was strongly positively correlated to annual precipitation for the region. On an annual basis, when there was more precipitation, counts of enterococci were higher, and vice-versa. However, this only applied to annual precipitation and did not hold with monthly precipitation.