

A Hedonic Valuation Approach to Valuing Combined Sewer Overflow Reductions

Authors : Matt S. Van Deren, Michael Papenfus

Abstract : Seattle is one of the hundreds of cities in the United States that relies on a combined sewer system to collect and convey municipal wastewater. By design, these systems convey all wastewater, including industrial and commercial wastewater, human sewage, and stormwater runoff, through a single network of pipes. Serious problems arise for combined sewer systems during heavy precipitation events when treatment plants and storage facilities are unable to accommodate the influx of wastewater needing treatment, causing the sewer system to overflow into local waterways through sewer outfalls. CSOs (Combined Sewer Overflows) pose a serious threat to human and environmental health. Principal pollutants found in CSO discharge include microbial pathogens, comprising of bacteria, viruses, parasites, oxygen-depleting substances, suspended solids, chemicals or chemical mixtures, and excess nutrients, primarily nitrogen and phosphorus. While concentrations of these pollutants can vary between overflow events, CSOs have the potential to spread disease and waterborne illnesses, contaminate drinking water supplies, disrupt aquatic life, and effect a waterbody's designated use. This paper estimates the economic impact of CSOs on residential property values. Using residential property sales data from Seattle, Washington, this paper employs a hedonic valuation model that controls for housing and neighborhood characteristics, as well as spatial and temporal effects, to predict a consumer's willingness to pay for improved water quality near their homes. Initial results indicate that a 100,000-gallon decrease in the average annual overflow discharged from a sewer outfall within 300 meters of a home is associated with a 0.053% increase in the property's sale price. For the average home in the sample, the price increase is estimated to be \$18,860.23. These findings reveal some of the important economic benefits of improving water quality by reducing the frequency and severity of combined sewer overflows.

Keywords : benefits, hedonic, Seattle, sewer

Conference Title : ICWESF 2018 : International Conference on Water Economics, Statistics and Finance

Conference Location : Amsterdam, Netherlands

Conference Dates : December 03-04, 2018