

Abstract

Urban and Suburban stormwater runoff accounts for approximately 47% of polluted miles of shoreline, 22% of lakes, and 14% of rivers (EPA 2006). One of the ways to diminish these numbers is to have individual homeowners install stormwater best management practices (BMPs) to control the flow and infiltration of nonpoint source runoff. Nonpoint source pollutants are waste products that do not come from a direct source and are deposited into local waterways in the form of waste, oils, and chemicals. The number of nonpoint source pollutants can increase substantially during heavy storms, especially in urban and suburban areas. In Philadelphia, for example, they have a Combined Sewer Overflow (CSO) system, that allows excess stormwater to drain into the sewer system, overwhelming the capacity and spilling into local waterways. Urban and suburban areas have an increased amount of paved areas, leading to less infiltration and an increase in flooding and pollution transportation. This stated preference survey hopes to analyze the willingness for consumers to contribute to stormwater management, while decreasing hypothetical bias through different treatment groups.

Introduction

Best management practices are measures used to control the flow and quality of stormwater, meant to decrease pollution runoff into bigger water bodies. In this survey, we look at two best management practices: rain gardens and conservation landscaping. Rain gardens are a lower elevation in a yard filled with native plants with deep roots and gravel to serve as a collection area for the household when stormwater runs off their roof, driveway, or yard. These serve as a holding area for stormwater runoff and increases absorption while decreasing the flow into bigger water areas. Conservation landscaping, though similar, focuses on the placement of native plants where wildlife and pollinators can thrive. This experiment looks at how much a consumer is willing to pay to have these practices installed in their home and compares different factors that indicate their decision.

A common difficulty with stated preference willingness to pay surveys is hypothetical bias. Hypothetical bias occurs when a homeowner overstates their willingness to pay because it is a theoretical situation.

Methods

This survey hopes to decrease hypothetical bias by using four randomly assigned treatment groups: Control, Cheap Talk, Consequentiality I and Consequentiality II, to see which treatment is most effective in decreasing the bias.

The control treatment gives no guidance to the homeowner's decision, just simply asks how much they were willing to pay for each practice independent of each other. The cheap talk

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treatment prompts the homeowner with a description of hypothetical bias, then asks them to answer as if they would actually be spending money on this practice. Consequentiality I treatment offers that the top ten highest bids will be in contact with the local stormwater conservation group to initiate implementing the practice with the highest bid-hopefully prompting the homeowner to be more thoughtful in choosing their price. Finally, the consequentiality treatment II also uses the top ten bids to put the homeowners in contact with a specialist to answer questions and be a resource for the installing the practice, so the consumer has more freedom in implementing the stormwater conservation technique.

The survey also allows the homeowners to select the importance of different factors in their decision such as the cost and maintenance, and the recent COVID-19 pandemic would influence their willingness to pay.

Finally, homeowners are exposed to a choice experiment in the form of four questions asking them to choose between two options. This analyzes which attributes to a project an individual values more: homeowner's time, advice from specialists, installation speed, and homeowner payment.

Next Steps

The online survey is expected to be sent out mid-May to 10,000 residents in the Delaware and Southeastern Pennsylvania area (Brandywine, Red Clay, and White Clay watersheds). We expect that our survey will improve the framing of questions in a stated preference survey by analyzing which treatment group reduces hypothetical bias most efficiently. In addition, this survey will enhance understanding of homeowner's willingness to contribute to stormwater management, identify which practice is most favored by consumers, and what elements are most influential to their decisions.