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GREEN VS. GRAY

Article by Adam Thomas | Video by Jeff Chase | October 28, 2016

UD study suggests people prefer conservation as way to protect drinking water

The water crisis in Flint, Michigan put the need to protect and invest in clean drinking water front and center in the minds of many Americans. But how to go about investing, as well as how to get the public on board with such spending, is a difficult challenge that faces policymakers.

A new study from the University of Delaware has found that when given the choice, people prefer to invest their money in conservation, such as protecting key areas of a watershed — also referred to as green infrastructure — rather than in traditional water treatment plants — also referred to as gray infrastructure.

They also found that different messages related to climate change, global warming, extreme weather events and decaying infrastructure affect people's willingness to contribute to projects.

The study was led by Kent Messer, the Unidel Howard Cosgrove Chair for the Environment and director of the Center for Experimental and Applied Economics (CEAE) in the University's College of Agriculture and Natural Resources (http://canr.udel.edu/) (CANR).

The results were recently published in the *Agricultural and Resource Economics Review* (http://journals.cambridge.org/action/displayJournal?jid=AGE).

Leaning green

Participants in the study's field experiment heavily favored green infrastructure over gray infrastructure.

"People are much more willing to pay for conservation," Messer said. "They like the idea of permanently protecting the waters from their source and avoiding having to do technological fixes."

Using a field experiment involving 251 adult participants from sites throughout northern Delaware — including UD's Ag Day, the New Castle County Farmers Market and the Southbridge community in Wilmington — the researchers had participants perform a simple task in which they earned money for that action and were then asked if they would like to donate the funds to an organization that could help in alleviating water quality issues in the future.

"People didn't just show up and automatically receive money. They earned their money. Then, we asked if they wanted to donate it to either a conservation cause (green infrastructure) or to help drinking water utilities (gray infrastructure)," said Messer who added that the CEAE likes to apply a charitable giving context to their research to see what people will actually do with the money as sometimes surveys aren't always aligned with actual behavior.

Participants could donate to either the American Water Works Association (AWWA), representing the traditional gray infrastructure, or the Conservation Fund, representing green infrastructure.

Greenseams

Will Allen, vice president for sustainable programs and director of conservation planning and integrated services at the Conservation Fund, said the organization is involved in many projects that utilize green infrastructure, such as a project called Greenseams in Milwaukee.

According to the Conservation Fund's website (http://www.conservationfund.org/projects/greenseams-program), Greenseams launched in 2001 as a flood management program partnership between the organization and the Milwaukee Metropolitan Sewage District. The group purchased land and conservation easements upstream from the city where major suburban growth was expected to occur.

More than 100 properties have been protected, preserving 3,142 acres of flood-prone land within greater Milwaukee, including 28 communities and 1.1 million people. The wetlands protected and restored by the program are capable of holding an estimated 1.3 billion gallons of water.

Allen said the goal of green infrastructure is not just to ensure that water is clean and improve the quality of a city's drinking water, but also to deal with flood mitigation.

"Milwaukee is unluckily a poster child for flooding. It's just really flat and all the water just kind of drains into the city and they can have some catastrophic floods," said Allen.

Flooding can be especially problematic in American cities that have aging systems in which floods can cause water to mix with sewage.

Green infrastructure is beneficial in helping prevent flooding before it happens, something that gray infrastructure can sometimes have trouble dealing with.

"If you can avoid having a lot of water go into those storm water systems then you can avoid the combined sewer overflows," said Allen.

Importance of messaging

The survey also examined how different messages affected people's choices.

They found that when it comes to developing a message to inform citizens why protecting water is important, people were more willing to give when climate change or global warming was discussed compared to messages that emphasized extreme weather events.

"The big surprise was that messages stating that 'storms are increasing in frequency due to extreme weather events,' led to a dramatic decrease in people's willingness to pay for either conservation or gray infrastructure" said Messer. "This has important implications for how politicians and conservation leaders talk about drinking water protection."

Messer said that when it comes to policymaking, there has been a debate on whether it was more effective to avoid discussion of climate change and instead focus on large storms. This study suggests focusing on extreme weather events may have a negative impact.

“This research suggests the emphasis on large storms like Hurricane Sandy will actually make people less willing to take action as it appears that people perceive these large storms as being out of human control,” he said. “If it’s just decaying infrastructure, normal storms, or even climate change, then people might feel they can do something about it. But when you start really emphasizing these large magnitude storms, there becomes a sense of hopelessness.”

About the research team

The research was supported by the National Science Foundation North East Water Resources Network (NEWRNet) project and the USDA-funded national Center for Behavioral and Experimental Agri-Environmental Research (CBEAR), of which Messer is also the co-director.

The research also involved Sean Ellis, a doctoral student in the Alfred Lerner College of Business and Economics; Matthew Miller, a doctoral student in CANR; and Jacob Fooks, a UD alumnus now working with the United States Department of Agriculture (USDA) Economic Research Service.