GREEN STORMWATER INFRASTRUCTURE

SCREENING-LEVEL VALUATION TOOL

Water, wastewater, and stormwater utilities in the United States made significant investments in water infrastructure throughout the 20th century to meet the pressing public health needs and evolving environmental regulations of the times. Today utilities face a new set of challenges, including aging infrastructure, obsolete technologies, increased demand, climate change, and increasingly stringent environmental standards. These challenges provide an opportunity to meet environmental and infrastructure challenges using a new generation of approaches, including green infrastructure.

Green infrastructure refers to the use of vegetation and soil to manage water. The term can encompass a range of natural environments (e.g. forests, wetlands, floodplains, riparian buffers, parks, and green space) as well as constructed assets (rain gardens, green roofs, bioswales, retention ponds, and permeable pavement).

Used by itself or in tandem with manmade infrastructure, green Infrastructure can directly support utility service targets (e.g. water quality, flood risk reduction), while providing a broad range of community benefits.

An increasing number of resources and tools are now available to support quantification and valuation of the benefits of green infrastructure, but many of the existing resources and tools are focused on specific geographies, benefits, or asset types, and others require significant investments in staff time, data, or economic expertise.

BUILT TO SUPPORT RAPID SCREENING-LEVEL ANALYSIS

To fill this perceived gap, Earth Economics developed a spreadsheet tool with a framework, methods and values to support rapid screening-level analysis of the costs and benefits associated with a range of green infrastructure investments. Guidance was provided by the Green Infrastructure Leadership Exchange. The tool provides both default regional values and assumptions, but also allows for custom user inputs when the information is available. An accompanying guide provides descriptions, instructions, and best practices for each type of green infrastructure, and each associated ecosystem service valued within the tool. The following examples illustrate the kinds of benefits that can be valued using the tool.

EXAMPLE 1

MARSH PARK

LOS ANGELES, CALIFORNIA[1]

The City of Los Angeles developed a passive recreation and bioretention area to capture water that would otherwise flow into the LA River. Using project information collected by the American Society of Landscape Architects, benefits of this installation were estimated in the tool. Results show that the installation provides numerous benefits to the city and community including: CSO Reduction, Stormwater Capture for Water Supply, Stormwater Quality, Environmental Education, and Aesthetic Value.

BENEFITS	VALUE (PER YEAR)
CSO Reduction	$7,009
Stormwater Capture for Water Supply	$449
Stormwater Quality	$1,667
Environmental Education	$88
Aesthetic Value	$4,376
Costs	
Estimated Capital Costs	-$135,600
Estimated Maintenance Costs (Annual)	-$450

Net Present Value (3% discount rate): $107,311.15
Benefit-Cost Ratio: 1.57

EXAMPLE 2

TERRACED REFORESTATION

COVINGTON KENTUCKY[2]

Covington, Kentucky developed forested terraced adjacent an interstate corridor. These mile-long terraces were developed to capture rainfall that would otherwise contribute to sewer overflows. The City of Covington compared the costs of conventional and green installations and found the green infrastructure installation to be the most cost effective. In addition to CSO reduction, the installation provides a variety of other benefits, including: Stormwater Flood Risk Reduction, CSO Reduction, Stormwater Capture for Water Supply, Stormwater Quality, Urban Heat Island Reduction, Aesthetic Value, and Carbon Sequestration.

BENEFIT CATEGORY	VALUE (PER YEAR)
Stormwater Flood Risk Reduction	$2,050
CSO Reduction	$167,546
Stormwater Capture for Water Supply	$8,000
Stormwater Quality	$43,459
Urban Heat Island Reduction	$3,109
Carbon Sequestration	$983
Costs	
Estimated Capital Costs	-$1,654,902
Estimated Maintenance Costs (Annual)	-$35,600

Net Present Value (3% discount rate): $2,073,475
Benefit-Cost Ratio: 1.89

[1] "Marsh Park: Case Study 267" (2010) American Society of Landscape Architects. Retrieved from: https://www.asla.org/uploadedFiles/CMS/Advocacy/Federal_Government_Affairs/Stormwater_Case_Studies/Stormwater%20Case%20267%20Marsh%20Park,%20Los%20Angeles,%20CA.pdf

[2] Terraced Reforestation: Case Study 58 (2010) American Society of Landscape Architects. Retrieved from: https://www.asla.org/uploadedFiles/CMS/Advocacy/Federal_Government_Affairs/Stormwater_Case_Studies/Stormwater%20Case%20058%20Terraced%20Reforestation,%20Covington,%20KY.pdf

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