



CAMP WILKES, ALONG BILOXI BAY, MS

Steps to Conduct Benefit-Cost Analysis for Resilient Solutions

- 1  Select Candidate Strategies
- 2  Define Investment Objective & Scope
- 3  Identify Benefits & Costs
- 4  Identify Non-Market (Non-Economic) Considerations
- 5  Define Analysis Parameters
- 6  Perform Economic Evaluation
- 7  Rank Strategies



EDGe\$

Economic Decision Guide Software Online Tool

Easy to use community resilience benefit-cost analysis tool

Success Story

“Using EDGe\$ was helpful as someone with a limited economics background. I could have created a spreadsheet and tried to do a benefit-cost analysis myself, but EDGe\$ provided a methodological framework so that I could focus on finding accurate inputs and communicating our results.”

- Camille Sicangco, Mississippi State University Extension Service Apprentice

Situation

Across the Mississippi Gulf Coast, bulkheads are the dominant method of shoreline stabilization for private properties. However, living shorelines have become increasingly recognized as a resilient and sustainable alternative to bulkheads. The introduction of living shorelines presents opportunities and challenges to evaluate economic tradeoffs for both project and community-wide scales. Current Extension programs, such as the Coastal Conservation and Restoration Program (CCR), foster understanding of resilient alternatives and benefit from being able to share clear benefit-cost analyses with their audiences.

Coastal shorelines in Mississippi are predominantly privately owned and often located in areas with conditions favorable for living shorelines. Camp Wilkes is a privately owned campground located along Biloxi Bay, MS. A 150-foot (45.7 m) bulkhead was donated and installed along the shoreline in 2016, but it failed shortly thereafter. In 2018-2019, Camp Wilkes worked with the CCR program to evaluate options for shoreline stabilization and implement a living shoreline. To support the use of this case study in future Extension programming with private landowners, CCR partnered with the Program for Local Adaptation to Climate Effects: Sea-Level Rise (PLACE:SLR) and performed a comparative economic analysis that evaluated the costs and benefits of living shoreline relative to bulkheads for small-scale projects.

Process

PLACE:SLR used EDGe\$ to perform a benefit-cost analysis (BCA) to assess living shorelines as compared to bulkheads, using the following considerations and assumptions:

- A 60-year planning horizon;
- A bulkhead would have to be replaced every 25 years (based on expert opinion);
- Non-disaster related benefits of living shorelines include a reduction in annual maintenance and replacement costs (every 25 years) compared to bulkheads;
- All benefits associated with the living shoreline are expected to accrue to Camp Wilkes;
- A discount rate of 2.3% was applied based on the 2020 OMB Circular A-94 Appendix C;
- Analysis did not include assessment of avoided damage by major hurricanes (Categories 3-5), due limited information available for comparing performance of living shorelines and bulkheads in major storms. For less intense hurricanes, reduced costs were included.

Contact Information & Resources

EDGe\$ Online Tool Landing Page

<https://edges.nist.gov/>

For more information about EDGe\$

<https://www.nist.gov/services-resources/software/edge-economic-decision-guide-software-online-tool>

NIST Community Resilience Program

<https://www.nist.gov/topics/community-resilience>

NIST Contact

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Success Story (cont.)

Outcomes

EDGe\$ provided the ability to explore various planning horizons and scenarios, which allow for a transparent set of economic comparisons between traditional and novel shoreline stabilization approaches. The analysis produced two important findings: (1) EDGe\$ demonstrated that a living shoreline was cost-effective for a 60-year planning period even if the initial cost of the living shoreline is 3.25 times that of a bulkhead; and (2) Sensitivity analysis demonstrated that a living shoreline is not only a cost-effective alternative for bulkhead replacement at an even shorter time period (15 years instead of 25 years), but it also meets the needs of the owner's 30-year planning horizon.

Advantage of Using EDGe\$

EDGe\$ aided the PLACE:SLR team with common definitions and economic data requirements when designing the analysis to help them understand what inputs (e.g., avoided replacement and maintenance costs) could be changed as well as how to interpret economic outputs (e.g., return-on-investment). The structure of the tool helped provide a roadmap of how to complete the BCA, instead of using an unstructured spreadsheet where it would be easier to make errors in the process. The flexibility of the EDGe\$ Online Tool enabled evaluation of different time-frames and discount rates for this analysis, which was valuable to assess different scenarios and solution options.

This study demonstrates that EDGe\$:

- Has the flexibility to help users understand relationships between project inputs and expected future costs and benefits;
- Allows users to compare the relative net benefit-cost of solutions;
- Enables users to evaluate the benefit-cost of solutions that have high uncertainty or variability in costs or benefits;
- Allows users to conduct sensitivity analyses, so that different scenarios can be considered in the decision-making process.

