TEXAS A&M AGRILIFE EXTENSION | DISASTER ASSESSMENT AND RECOVERY

The Value of Ecosystem Services in Texas

Quantifying Environmental Benefits for Benefit-Cost Analyses of Green Infrastructure

Green Infrastructure for Texas (GIFT), part of the Texas A&M AgriLife Extension Services Disaster Assessment and Recovery unit, in collaboration with AECOM, has developed recommendations for incorporating ecosystem service values into benefit-cost analyses (BCAs) in Texas. This study presents ecosystem service values for three priority ecosystems—wetlands, grasslands/prairies, and urban green open space—enabling more locally contextualized inputs for evaluating green infrastructure (GI) projects and nature-based solutions (NBS).

Key Findings

This study presents the annual estimated value of ecosystem services for the three priority ecosystems using benefit transfer methods from peer-reviewed and gray literature. These values reflect services including flood mitigation, water supply, habitat provision, climate regulation, and recreation.

Annual Ecosystem Service Value per Acre

$18,948
WETLANDS

$1,941
GRASSLANDS/ PRAIRIES

$19,992
URBAN GREEN OPEN SPACE

Note: Values are shown in 2021 dollars

Why This Matters

Although agencies such as the Federal Emergency Management Agency (FEMA) and the Texas Water Development Board incorporate ecosystem services into BCA methods, their values are based on average values from national and/or international studies. These figures may fail to reflect the ecological, economic, and social context specific to Texas. This study addresses that gap by deriving values from Texas-specific literature to offer more geographically relevant values for evaluating the benefits of GI and NBS in the state.

Implications for Policy and Practice

Texas-specific ecosystem service values can help decision makers:

- Understand the value of ecosystem services and what components make up this value in a BCA for GI and NBS projects.
- Prioritize GI and NBS projects that deliver long-term value to Texas communities and ecosystems.
- Identify appropriate project funding.

Key Terms

Nature-Based Solutions (NBS)
Actions to protect, sustainably manage, and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits.

Green Infrastructure (GI)
A subset of NBS that uses natural hydrological processes and natural elements (like soil and plants) to capture stormwater and reduce flows to storm sewer systems or surface waters.

Benefit-Cost Analysis (BCA)
A systematic process for identifying, quantifying, and comparing expected benefits and costs of an investment, action, or policy.

Ecosystem Services
The direct and indirect benefits that humans derive from natural ecosystems. Benefits can include water filtration, flood mitigation, carbon sequestration, coastal protection, pollination, and recreation.

Ecosystem service values vary widely depending on geographic location, ecological context, and study design.

Methodological Highlights

- Full documentation of source studies and assumptions is provided in the full report.
- A benefit transfer approach was applied, meaning values were adapted from Texas-relevant studies, and adjusted for variables such as inflation and land area where necessary.
- Valuation methods used in underlying studies include cost savings from damage prevention, replacement costs, meta-analysis, and stated and revealed preference techniques.

Learn more.
Scan the QR code to visit the GIFT Ecosystem Services Benefit-Cost Analysis homepage and to access the full report.

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