

# **Integrating Performance and Budget: An Innovative Approach to Wetland Conservation**

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# Overview

- Performance-based budgeting
- Wetland functions and services
- Economic valuation methods
- Example
- Limitations and future direction
- Questions

# Performance-Based Budgeting

- Government Performance Results Act (1993)
- President's Management Agenda (2001)
- Result: Federal agencies need to integrate performance measures with budget submissions
- Also applicable to state and local agencies and private land owners

# Using Performance Measures

Wetland Functions



Wetland Services



Economic Values



Performance Measures

# Identify Wetland Functions

- Regulation (water, gas, climate, soil, nutrients, biota)
- Habitat (refuge, nursery)
- Production (food, raw materials, genetic resources)
- Information (recreation, aesthetic, cultural, spiritual, science, education)

# Wetland Functions and Services

<b>Function</b>	<b>Processes / Components</b>	<b>Goods and Services</b>
Water regulation	Role of land cover in regulating runoff	Drainage and natural irrigation
Soil retention	Role of vegetation root matrix and soil biota in soil retention	Maintain productivity of arable land
Waste treatment	Role of biota in removal or breakdown	Pollution control, detoxification

Source: de Groot et al., 2002

# Wetland Functions and Services

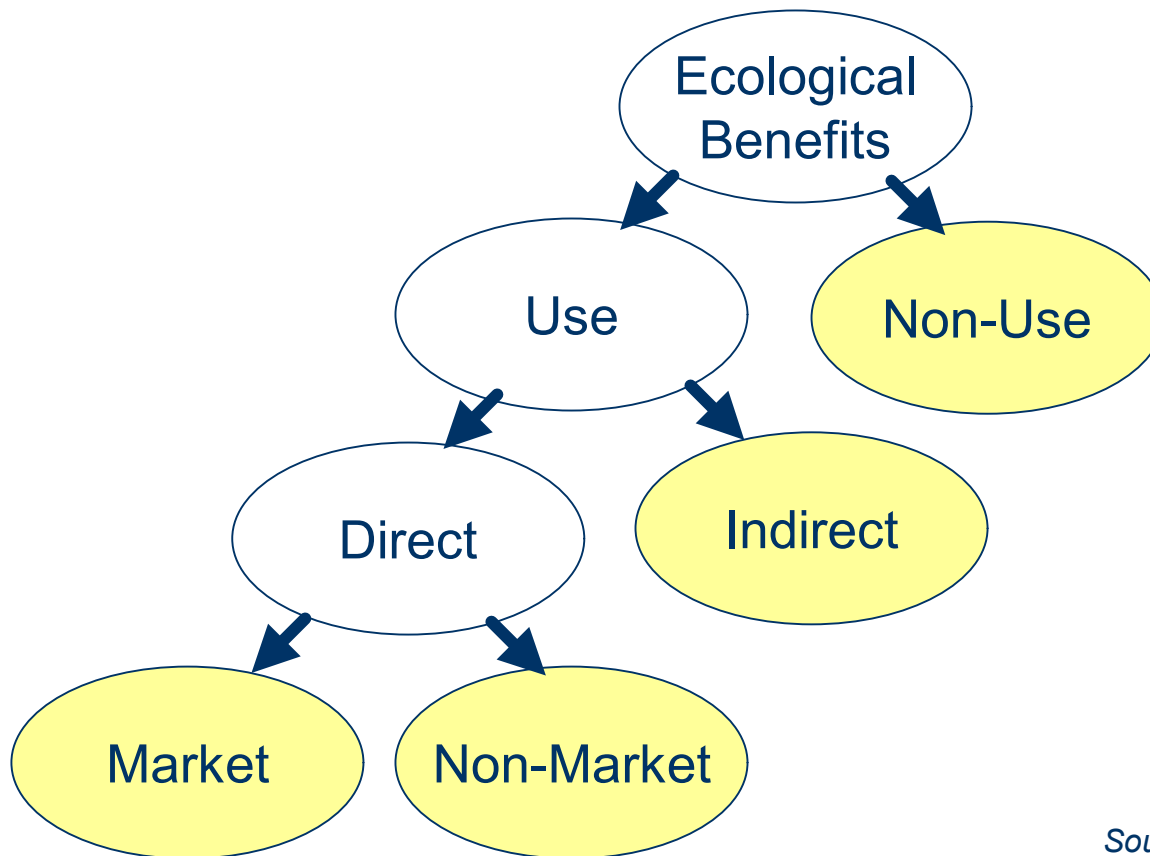
<b>Function</b>	<b>Processes / Components</b>	<b>Goods and Services</b>
Refuge	Habitat for wild plants and animals	Maintain genetic diversity; Hunting and gathering
Aesthetic	Attractive landscape features	Enjoyment of scenery
Recreation	Variety of landscapes with potential recreational use	Ecotourism

Source: de Groot et al., 2002

# Economic Valuation

- Anthropocentric (based on human assignments of value)
- Utilitarian (based on the ability to provide well-being)
- Includes all instrumental values, including both use and non-use values (laws can also be based on intrinsic value – e.g., ESA)
- Based on the tradeability of goods and services
- Economic valuation is based partly on income, which can change over time

# Types of Ecological Benefits



Source: EPA, 2000

# Types of Ecological Benefits

- Market benefits (e.g., commercial fish species)
- Non-market benefits (e.g., recreational fishing)
- Indirect benefits (e.g., sediment trapping, flood mitigation, fish refugia)
- Non-use benefits (e.g., altruistic, bequest, and existence value)

# Measuring Economic Value

- Choose appropriate method
  - Market methods
  - Revealed preference methods (recreational demand, hedonic wage/property, averting behavior)
  - Stated preference methods (contingent valuation, conjoint)
- Frame the question
- Benefits transfer

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# Example

- Sample entity (public or private) that manages wetlands
- Wetland performs regulation functions:
  - Water regulation
  - Soil retention
- Identify value of regulation functions
- Compare

# Example



# Sample Calculation

- Erosion productivity loss (EPL) = (Rent ÷ years of life)
- Years of life = inches of topsoil in the “A” horizon/inches of sheet, rill, and wind erosion per year
- Rent = average rental rate for cropland in a specific county
- For example: Rent = \$40/ac/yr; 10 inches of topsoil in the “A” horizon

# Sample Calculation

## Test Site

- Erosion = 0.5 inches/yr
- Years of life = 20
- EPL = \$2/acre/yr

## Control Site

- Erosion = 0.05 inches/yr
- Years of life = 200
- EPL = \$0.20/acre/yr

Differential = \$1.80/acre/year.

If 200 acres are affected, then a rough estimate of the value of these wetland services (only) would be \$360/year. Along with other results, this would be used to estimate the return on the investment.

# Limitations and Future Direction

- Generally requires benefits transfer
- Not all benefits can be valued easily or given the budget for measurement
- May require more data than is available
- Indicates importance of continued study

# Benefits of Approach

- Avoids polarizing nature and limited usefulness of some other performance metrics (e.g., penalties levied)
- True measure of performance related to social benefits agency provides
- Educates the public and decision makers about ecosystem values

# Questions?



# Contact



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