



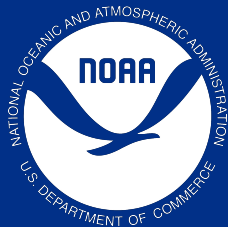
Sea Grant

ILLINOIS-INDIANA



Illinois Extension

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN



PURDUE
UNIVERSITY®

Extension - Forestry
and Natural Resources

Great Lakes Ecosystem Services- Module 1: Introduction

GreatLakesEcosystemServices.org

Leslie Dorworth

Illinois Indiana Sea Grant & Purdue University

Margaret Schneemann

Illinois Indiana Sea Grant & University of Illinois Extension



Valuing Ecosystem Services Audience

Natural resource managers and decision makers who need to better understand

- Ecosystem service framework
- Ecosystem service valuation
- How to use ecosystem valuation in decision-making



The Basics of Ecosystem Services

- Learn the terminology
- Understand how ecosystem services and nature-based solutions are relevant to your situation
- Review examples of ecosystem service valuation and nature-based solutions



The Basics of Ecosystem Services

- Ecosystem services are the contributions that nature makes to environmental and human well being.
- Valuing ecosystem services can improve decision-making and natural resource management.



A Few Terms: Direct Benefit

- **Direct** contributions represent the values people assign to use or consumption

- Forest – direct services that we value include

- ✓ Timber production
- ✓ Wildlife viewing
- ✓ Animals for hunting

*Therefore, taking and using any substance from our example, the forest, is a **direct benefit!**

* We can be consumptive or non-consumptive and it is still a direct benefit.



A Few Terms: Indirect Benefit

- **Indirect** contributions represent the values of people who do not directly use or consume nature.

- Forest – **indirect** services that we value include
 - Water retention
 - Soil retention to prevent erosion
 - Carbon dioxide uptake

* Therefore, even if you never visit a forest or use its products directly, the forest still benefits you **indirectly!**

* Examples of indirect benefit include indirect use as well as non-use values.



Common terms

Ecosystems	Benefit / Co-benefit	Use Value
Ecosystem Service	Economic Valuation	Non-use Value
Ecosystem Condition	Valuation Scenario	Revealed Preferences
Final Ecosystem Good	Final Economic Good	Stated Preferences
Biophysical	Socioeconomic	Benefit Transfer



Ecosystems in the Great Lakes Coastal Zone

The following slides are not representative of all ecosystems found in the Great Lakes.

Terrestrial Habitat - Coastal

A coastal habitat provides:

1. protection from storms and flooding
2. habitat for a variety of plants and animals
3. recreational opportunities as well as employment.

*This is not an exhaustive list of the services. For more information visit [U.S. EPA National Ecosystem Services Classification System \(NESCS\)](#).



Terrestrial Habitat - Prairie

A prairie habitat provides:

1. protects the soil from erosion
2. maintains diversity and provides habitat
3. nutrient cycling

*This is not an exhaustive list of the services. For more information visit [U.S. EPA National Ecosystem Services Classification System \(NESCS\)](#).



Aquatic Habitat - Urban

An urban aquatic habitat provides:

1. recreation and tourism
2. industrial processes
3. transportation

*This is not an exhaustive list of the services. For more information visit U.S. EPA National Ecosystem Services Classification System (NESCS).



Aquatic Habitat -Marsh/Wetland

A marsh or a wetland provides:

1. water retention
2. aesthetic appreciation
3. groundwater recharge

*This is not an exhaustive list of the services. For more information visit U.S. EPA National Ecosystem Services Classification System (NESCS).



Ecosystem Services in the Great Lakes Coastal Zone

The following slides are not representative of all ecosystem services found in the Great Lakes.

Extractive Use

Extractive use services include:

1. Raw material for transformation, such as timber
2. Fisheries
3. Drinking water

*This is not an exhaustive list of the services. For more information visit U.S. EPA National Ecosystem Services Classification System (NESCS).



In-situ Use

In-situ use services include:

1. Recreation
2. Information, science, education, and research-
3. Waste disposal/assimilation

*This is not an exhaustive list of the services. For more information visit [U.S. EPA National Ecosystem Services Classification System \(NESCS\)](#).



Non-Use

Non-use services include:

1. Existence
2. Bequest
3. Altruist

*This is not an exhaustive list of the services. For more information visit [U.S. EPA National Ecosystem Services Classification System \(NESCS\)](#).



Example Project: River Restoration

Human Action

Flooding along the Deep River in Lake Station, IN. The community came together to remove the dam to alleviate flooding.



Ecosystem Condition Change

Improves water flow, temperature, habitat, water quality, and habitat.



Ecosystem Service Change

Flooding has been reduced and on the side, recreational activities like kayaking and canoeing are feasible.



**Figure 1: Ecosystem services causal chain:
Translating a coastal zone management decision into ecosystem service benefits**

Figure adapted from Schuster & Doer, (2015)



Example: Sanitary Sewer Overflow

Human Action

A city upgrades infrastructure in response to intense rain events overwhelming the combined sewer system, causing



Ecosystem Condition Change

Changes in water quality indicators, such as dissolved oxygen, nutrient levels, algae, zooplankton.



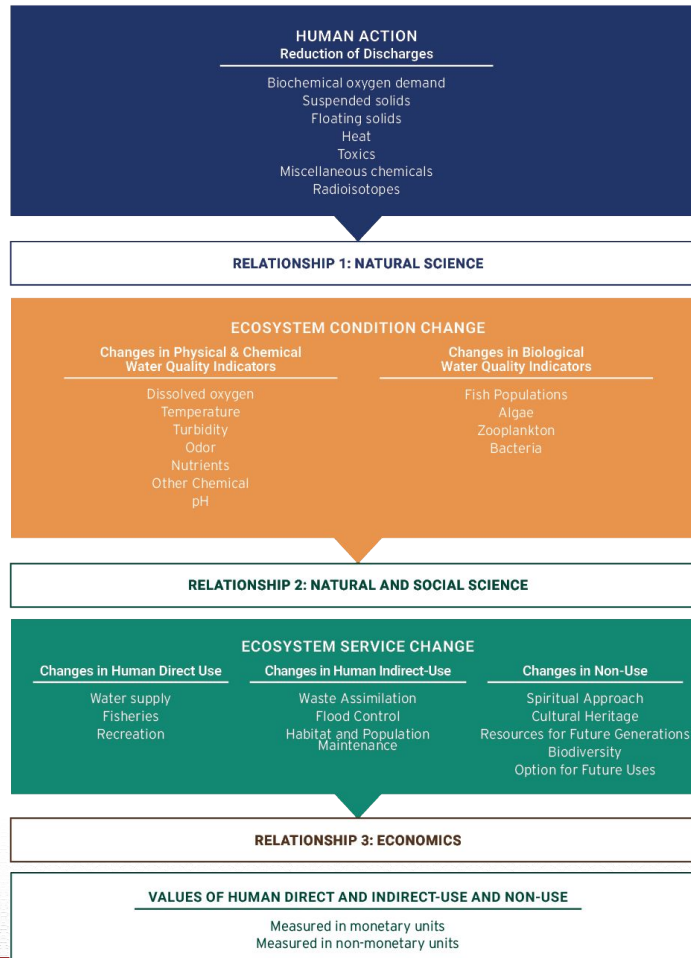
Ecosystem Service Change

Changes in direct, indirect and non-use services, such as water supply, recreation, and options for future uses.

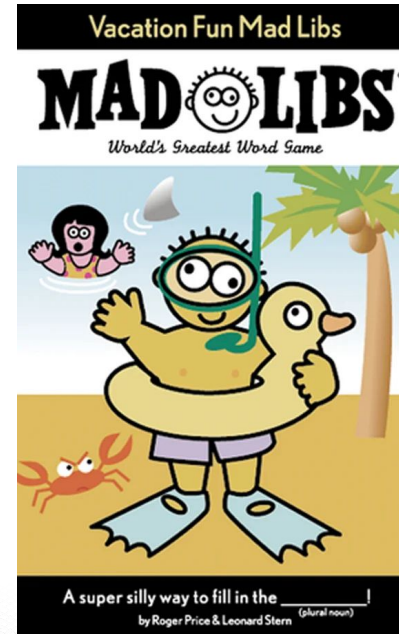


Figure 2: Example: Translating a reduction in wastewater discharge into an ecosystem service value

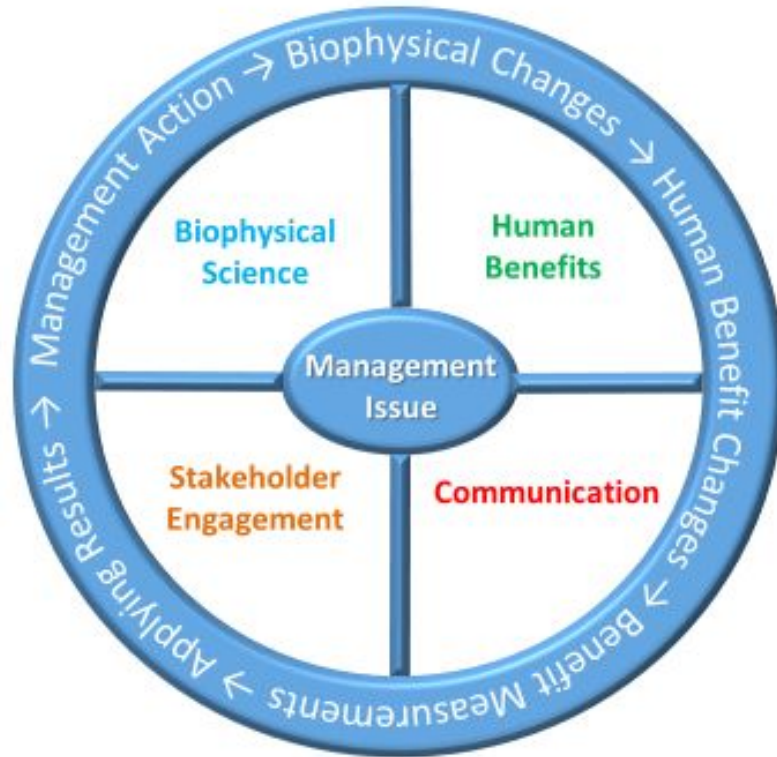
Source: Adapted from Freeman, (2003).



Applying an ecosystem services framework to your project



Ecosystem Services Framework



THE FOUR
ELEMENTS



Great Lakes Ecosystem Services

GreatLakesEcosystemServices.org

Leslie Dorworth

Illinois Indiana Sea Grant & Purdue University

Margaret Schneemann

Illinois Indiana Sea Grant & University of Illinois Extension

