ECOSYSTEM SERVICE VALUATION TO SUPPORT RESTORATION

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20 percent of the world’s surface fresh water
10,000 miles of freshwater coastline
The world’s largest freshwater dune system
Unique freshwater species
“Our waters created prosperity.”
...but there were consequences
The Great Lakes Restoration Initiative

• Established in 2009 to accelerate efforts to protect and restore the Great Lakes

• Has invested roughly $2.3 billion in restoration projects to date

• Provides resources to tackle sites of some of the most significant contamination in the country

• Five major focus areas
  ➤ Toxic Substances and Areas of Concern
  ➤ Invasive Species
  ➤ Nonpoint Source Pollution Impacts on Nearshore Health
  ➤ Habitats and Species
  ➤ Foundations for Future Restoration Actions
Emerging Questions

1. Where is the next best dollar spent?
2. What is the value of the investment so far?
3. What is the effect of restoration on quality of life?
Model Development

The goal of this project is to develop a tool capable of calculating the value of incremental changes in ecosystem services.

The tool is based on a series of nested ecosystem models and benefit transfer functions.

The tool will be applicable to all 14 Areas of Concern in Michigan.
Figure 4: Phase 2 Model
The project team developed causal loop diagrams for major ecosystem services including: water quality, recreation, fish and wildlife populations, and human health.
Answering the Questions

1. Where is the next best dollar spent?
2. What is the value of the investment so far?
3. What is the effect of restoration on quality of life?
A 2017 study by researchers at Grand Valley State University found that property values near Muskegon Lake increased by $11.9 million as a result of environmental restoration. This accounts for just one component of ecosystem service value.
Listing as an AOC

Eutrophication due to municipal/industrial discharges. Algal blooms and bacterial slimes and high levels of E. coli.

Tainted fish, contaminated fish - phenols, gasoline, mercury, PCBs

Degraded benthic community (heavy metals, organic chemicals)

Shoreline development/filling

Oil slicks, debris

Degraded water quality (trichloroethylene, dichloroethane, vinyl chloride, mercury)
Beneficial Use Impairments

Restrictions on Dredging (Removed)
Restrictions on Fish Consumption (Removed)
Restrictions on Drinking Water or Taste and Odor Problems (Removed)
Beach Closings (Removed)
Degradation of Aesthetics (in draft)

Degradation of Benthos
Eutrophication and Undesirable Algae
Degradation of Fish/Wildlife Populations
Loss of Fish/Wildlife Habitat
THANK YOU

Questions?

ICMA conference
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