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ECOSYSTEM SERVICE VALUATION TO SUPPORT RESTORATION

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THE GREAT LAKES

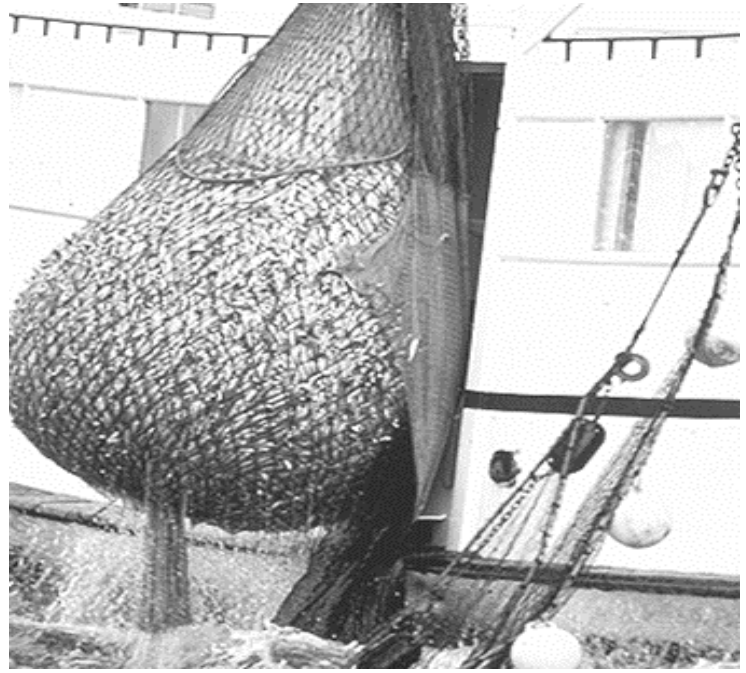
20 percent of the world's surface fresh water

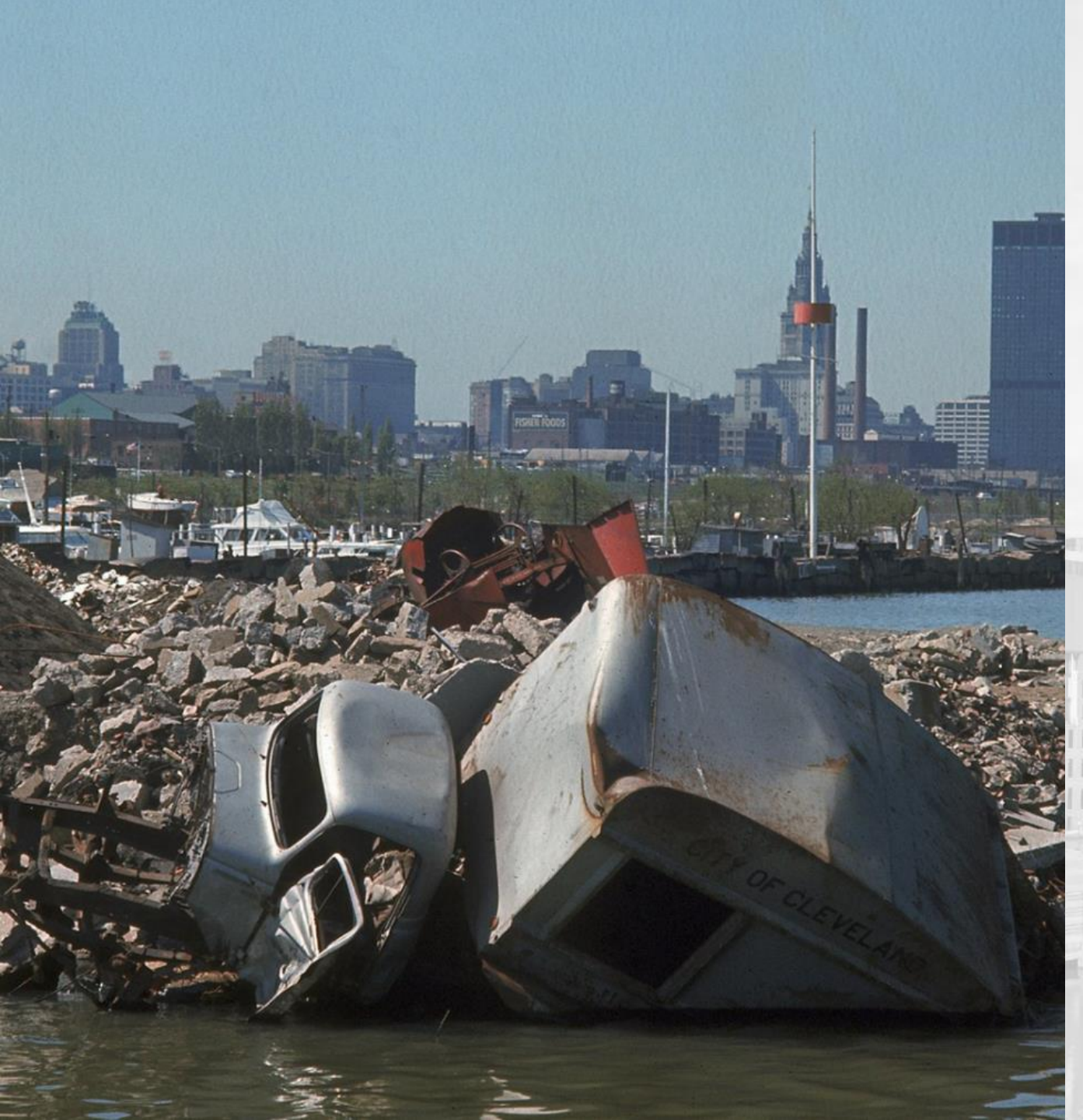
10,000 miles of freshwater coastline

The world's largest freshwater dune system

Unique freshwater species


“Our waters created prosperity”





…but there were

consequences

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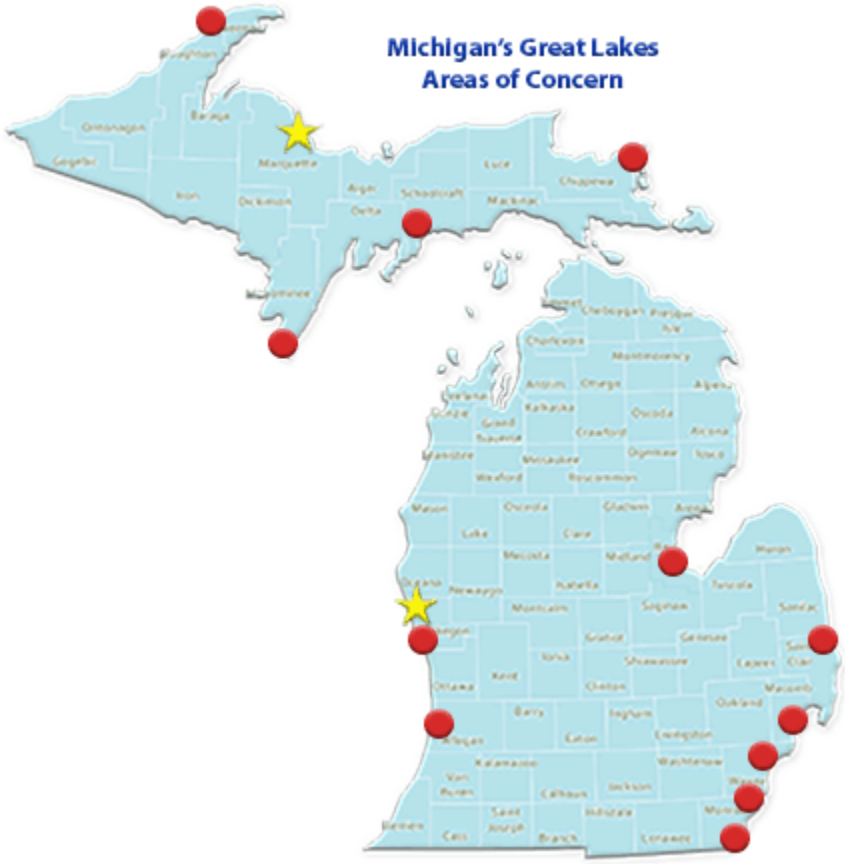
The Great Lakes Restoration Initiative

- 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



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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?

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Intermediate Services

- Habitat Provision
- Pest control
- Maintenance of Genetic Diversity
- Wastewater Treatment
- Local Climate Regulation
- Pollination
- Carbon Storage

Final Services

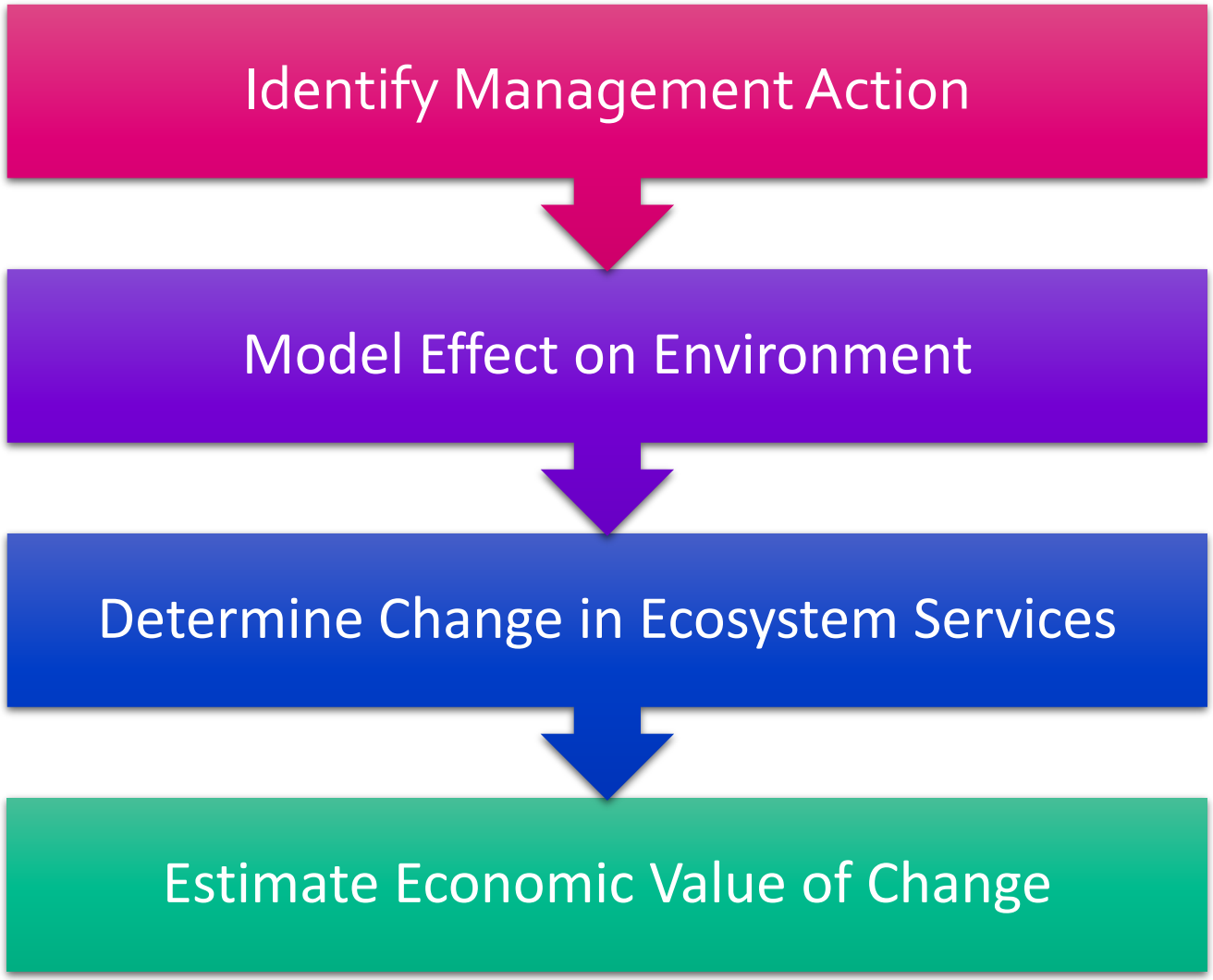
- Raw materials
- Moderation of extreme events
- Fresh water
- Spiritual/sense of place
- Food
- Aesthetics/ inspiration for art
- Medicinal Resources
- Erosion Prevention
- Tourism
- Health and Recreation

Model Development

The goal of this project is to develop 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.



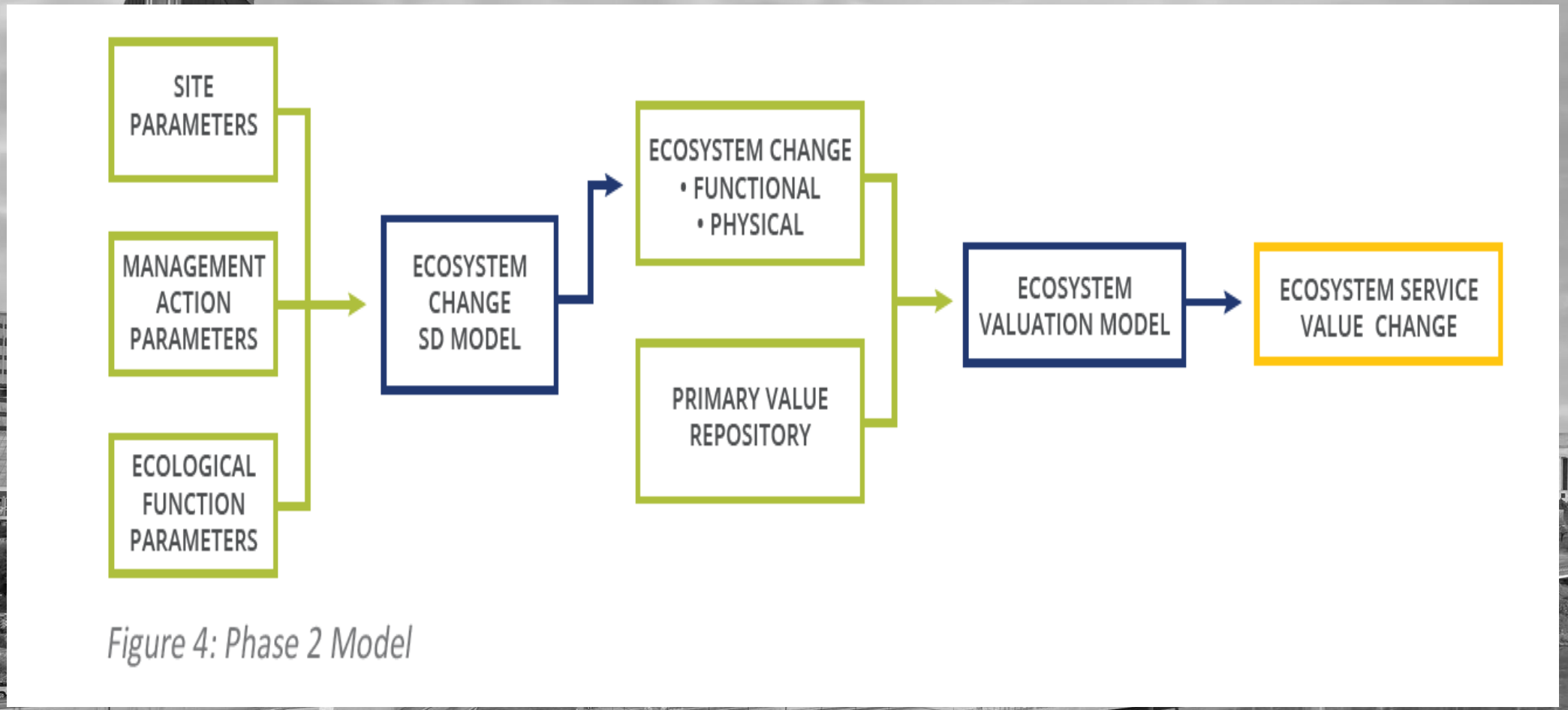


Figure 4: Phase 2 Model

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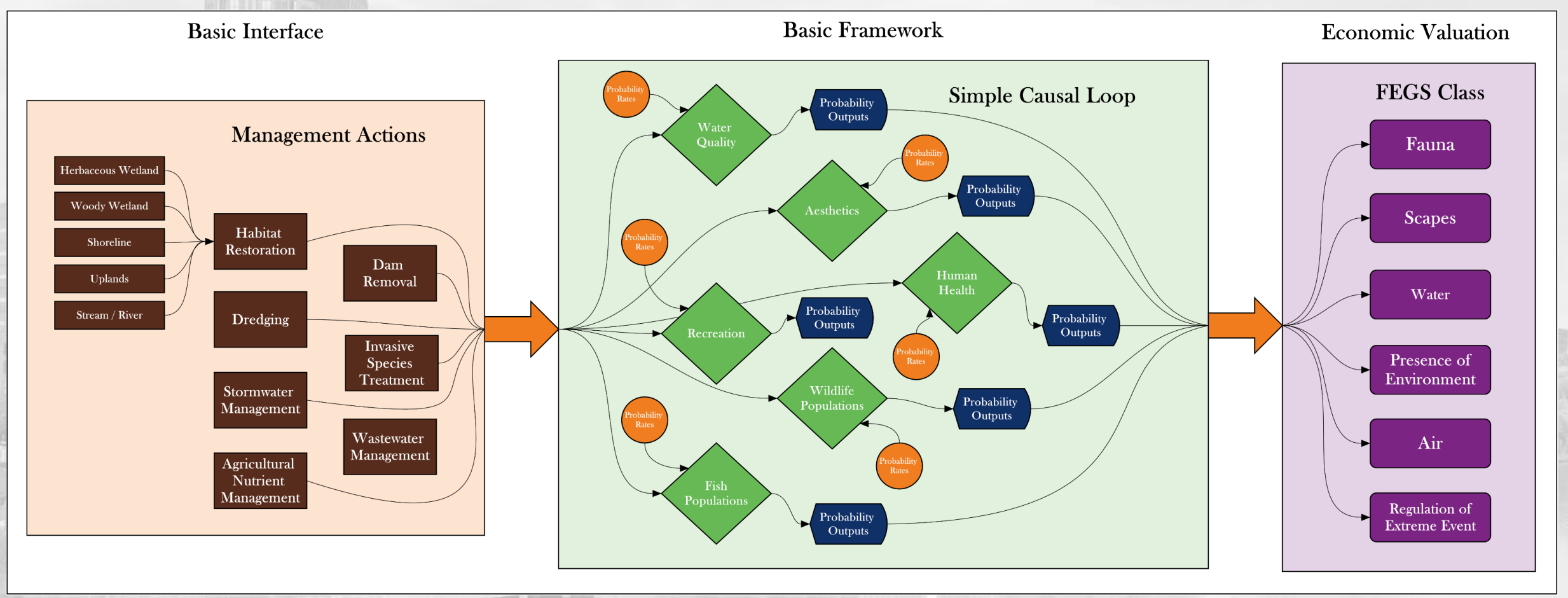
The project team developed causal loop diagrams for major ecosystem services including: water quality, recreation, fish and wildlife populations, and human health



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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?

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SPOTLIGHT: MUSKEGON LAKE AREA OF CONCERN

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)

Kathy Evans, West Michigan Shoreline Regional Development Commission

Beneficial Use Impairments

Kathy Evans, West Michigan Shoreline Regional Development Commission

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

Kathy Evans, West Michigan Shoreline Regional Development Commission

THANK YOU

Questions?

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