# Healthy Waters, Strong Economy

## *The Benefits of Restoring the Great Lakes Ecosystem*


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In partnership with:

Healing Our Water -- Great Lakes Coalition

Council of Great Lakes Industries

Great Lakes and St Lawrence Cities Initiative

- Great Lakes Restoration Strategy – policies, projects and programs to reverse degradation, restore Great Lakes ecosystem
- Brookings Institution & partners identify Great Lake region's natural & environmental attributes as cornerstones for economic transition & future vitality
- Commission leading economists to take hard-headed look at the true economic benefits of cleaning, maintaining special qualities of Great Lakes

- The highly-integrated Great Lakes economic region includes most of 12 US States and 2 Canadian provinces
- Solid and conservative analysis of economic impact of Great Lakes restoration only counts direct benefits in Great Lakes watershed, and census tracts adjoining Great Lakes in the eight states on the US side
- Confirms that the water, natural features and special quality of life made possible by the "freshwater coast" can be huge engine for economic growth & opportunity

# Two Approaches

- “Bottom-up”
  - Evaluate Effects One by One and Add Them Up
- “Top Down”
  - Extrapolate Studies to the Great Lakes as a whole
- Reconcile the two approaches

# Basic Benefit-Cost Analysis

- Important to distinguish between value and expenditure
- Short-term economic impacts are approximately independent of the benefits from expenditures
- Use present values of both costs and benefits

# Bottom-up Analysis

1. Identify ecological outcomes of value
2. Estimate plan's impact on these outcomes
3. Multiply by individual benefit
4. Scale by number of affected individuals

Example: Benefit of improved catch rates =

$\triangle$fish * $ benefit per $\triangle$fish * # anglers

Where are the benefits? Follow the people.

# Ecological Impacts Matrix

| ACTIONS AREAS: | HABITAT | INVASIVES | TOXICS | WATER TREATMENT | SEDIMENT | INFORMATION |
|---|---|---|---|---|---|---|
| SPECIFIC ACTIONS IN GLRC STRATEGY | Native Fish Communities in Open Water/Nearshore Habitats | Maritime Commerce. | Great Lakes Legacy Act Amendments and Reauthorization | New Grant Program | Buffer Strips | Expanding the Knowledge Base to Manage Current and Future Problems |
| | Wetlands | Canals and Waterways. | AOC Program Capacity | Wet Weather Program. Federal | Residue Management | Coordination under a Great Lakes Information Coordination Council (GLICC) |
| | Riparian Habitats | Trade of live organisms. | Federal/State/Local/Tribal Collaboration | Wet Weather Programs. State | Livestock Manure/Nutrient Management | Implement the U.S. contribution to the Global Earth Observing System of Systems (GEOSS) and the Integrated Ocean Observing System (IOOS) |
| | Coastal Shore and Upland Habitats | Early detection, rapid response, control, & management | Promote Development of Clean Treatment and Destruction Technologies, Beneficial Use, and Disposal Options | Indirect Pollution | Hydrology | Double federal research budget to Great Lakes |
| | | | Remediation of in place Priority Pollutants, and advance further towards virtual elimination | Testing | | Establish a regional management infrastructure (i.e. network of networks) to facilitate information exchange between GL ecosystem investigations and inform decisiton making |
| | | | Prevent emerging chemicals of concern from Entering the Great Lakes Basin and remove emerging chemicals of concern from sewage treatment plant effluent | Protect drinking water source quality | | Establish a Great Lakes Communications Workgroup |
| | | | Provide the Public with Healthy and Environmentally Friendly Choices | Fully Find DWSRF and increase flexibility | | |
| | | | Support efforts to reduce continental & global sources of PTS to the GL Basin | | | |
| INTERMEDIATE OUTCOMES | | | | | | |

| HUMAN VALUES & SERVICES | | | PARTIAL IMPACTS | | | | | | TOTAL IMPACTS |
|---|---|---|---|---|---|---|---|---|---|
| BEACHES | FEWER CLOSURES & ADIVSORIES | X | | | | | | | |
| | WATER CLARITY | X | | | | | | | |
| | IMPROVED HUMAN HEALTH | | | | | | | | |
| FISH & WILDLIFE | EXPANDED FISH POPULATIONS | X | | | | | | | |
| | LESS FISH CONTAMINATION | | | | | | | | |
| | EXPANDED BIRD POPULATIONS | X | | | | | | | |
| | MORE WATERFOWL | X | | | | | | | |
| | SPECIES HEALTH & SURVIVAL | | | | | | | | |
| AOCs | AOCs CLEANED OF TOXIC SEDIMENT | X | | | | | | | |
| AVOIDED ENGINEERING COSTS | LESS INTENSIVE WATER TREATMENT | X | | | | | | | |
| | REDUCED SEDIMENT DREDING, REMOVAL, & DISPOSAL | | | | | | | | |
| | LESS SEVERE FLOODING & EROSION | | | | | | | | |
| HUMAN HEALTH | VARIOUS IMPACTS | | | | | | | | |
| INVASIVE SPECIES | AVOIDED CONTROL COSTS | | | | | | | | |
| | REDUCED RISK FROM FUTURE INVASIVES AND/OR CLIMATE CHANGE | | | | | | | | |

Highly complex with strong interactions

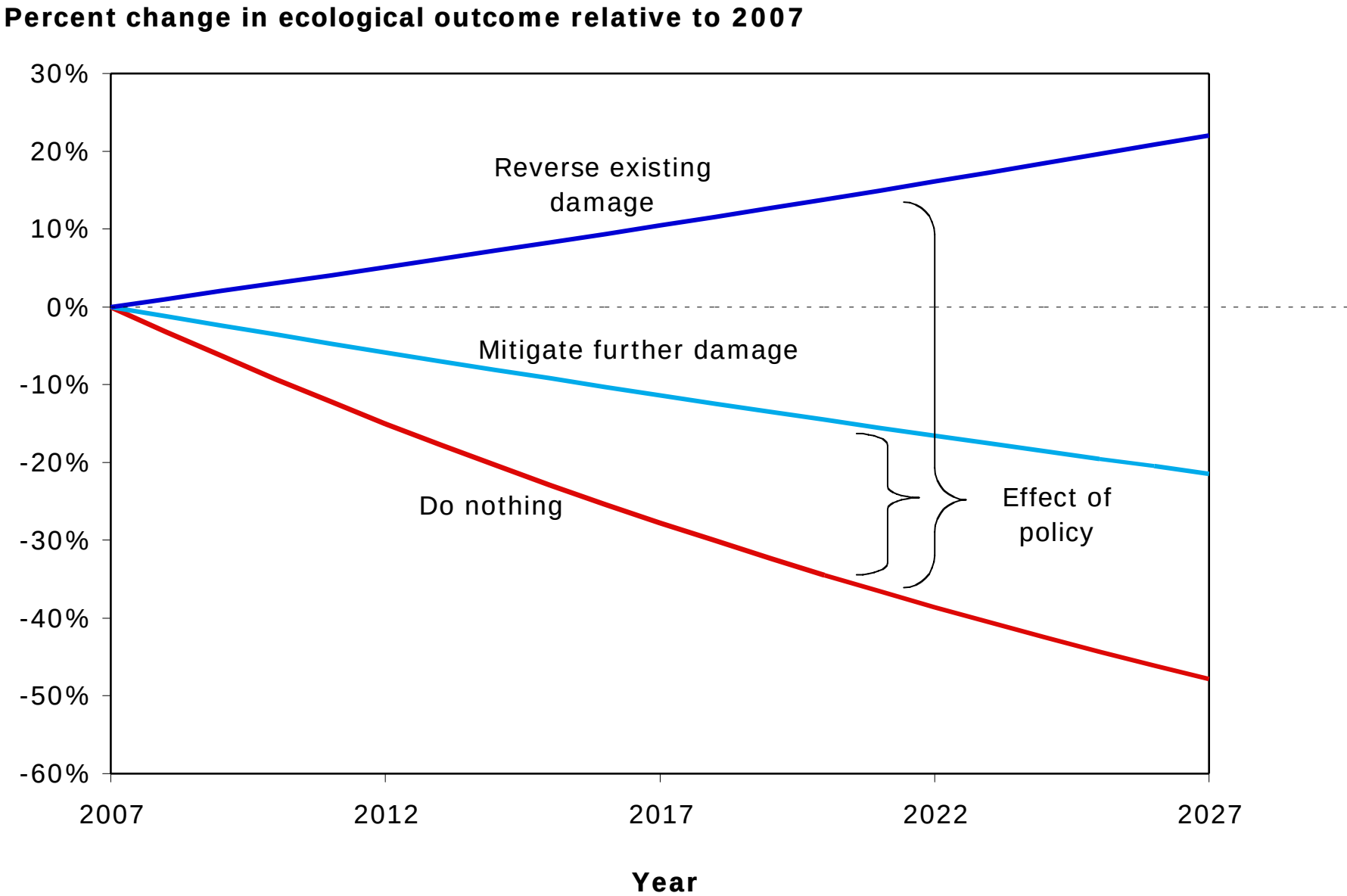
# Quantified Impacts

- Water quality
  - Fewer beach closings & advisories
  - Enhanced clarity & lower treatment costs
- Fish & wildlife
  - Higher fishery catch rates
  - Improved birding & waterfowl hunting
- Areas of Concern (AOCs)
  - Toxic sediment contamination cleaned up

# Unquantified Impacts

- Fish & wildlife
  - Lower fish contamination levels
  - Species health & survival
- Invasives & nuisance species
  - Avoided invasive control costs
  - Ecosystem resilience to invaders & climate change
  - Fewer algae blooms
- Human health
- Avoided engineering costs
  - Sediment dredging, removal, & disposal
  - Less erosion
  - Less severe flooding
  - Enhanced groundwater supply
- Nonuse Values

# Compare Policy to Baseline



# Top-down Analysis

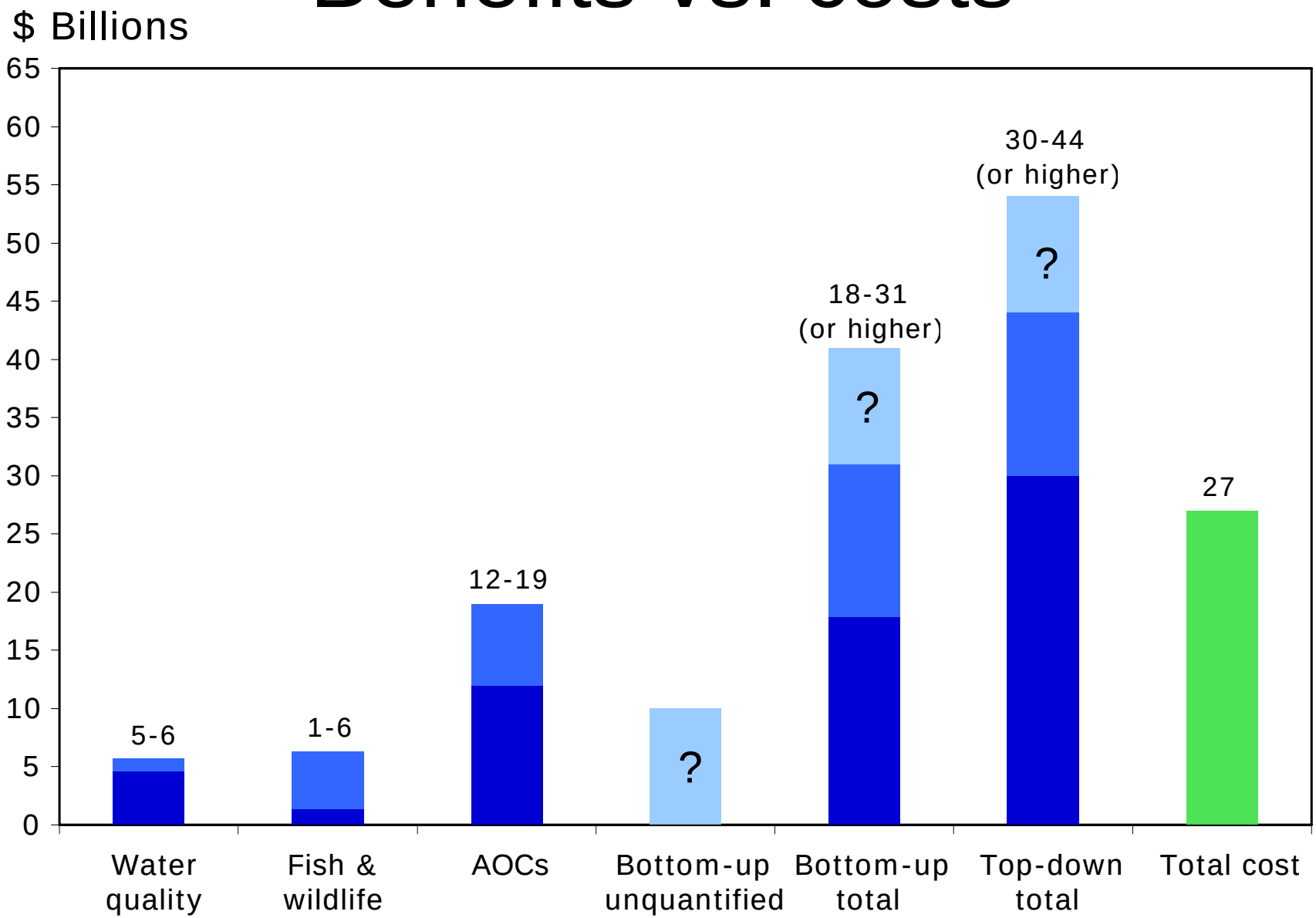
Property values reflect the myriad environmental benefits associated with locations

Studies indicate that cleaning Great Lakes will increase nearby residential property values

1. Start with plausible percent increase
2. Multiply by value of residential property

Property values may increase elsewhere as Great Lakes region becomes more attractive

# Benefits vs. costs



# Who Should Pay?

- States clearly have an interest and should pay
- Rest of the country also benefits, and thus federal government should pay, too:
  - Cleanup technologies for GL will benefit other parties of the country
  - Less congestion elsewhere
  - Lower disaster costs elsewhere