

What is Clean Water Worth? And to Whom?

Past, present, and future methods to assess the value of clean water policies



Bonnie Keeler

*Center for Science,
Technology, and
Environmental Policy*

HUMPHREY SCHOOL
OF PUBLIC AFFAIRS

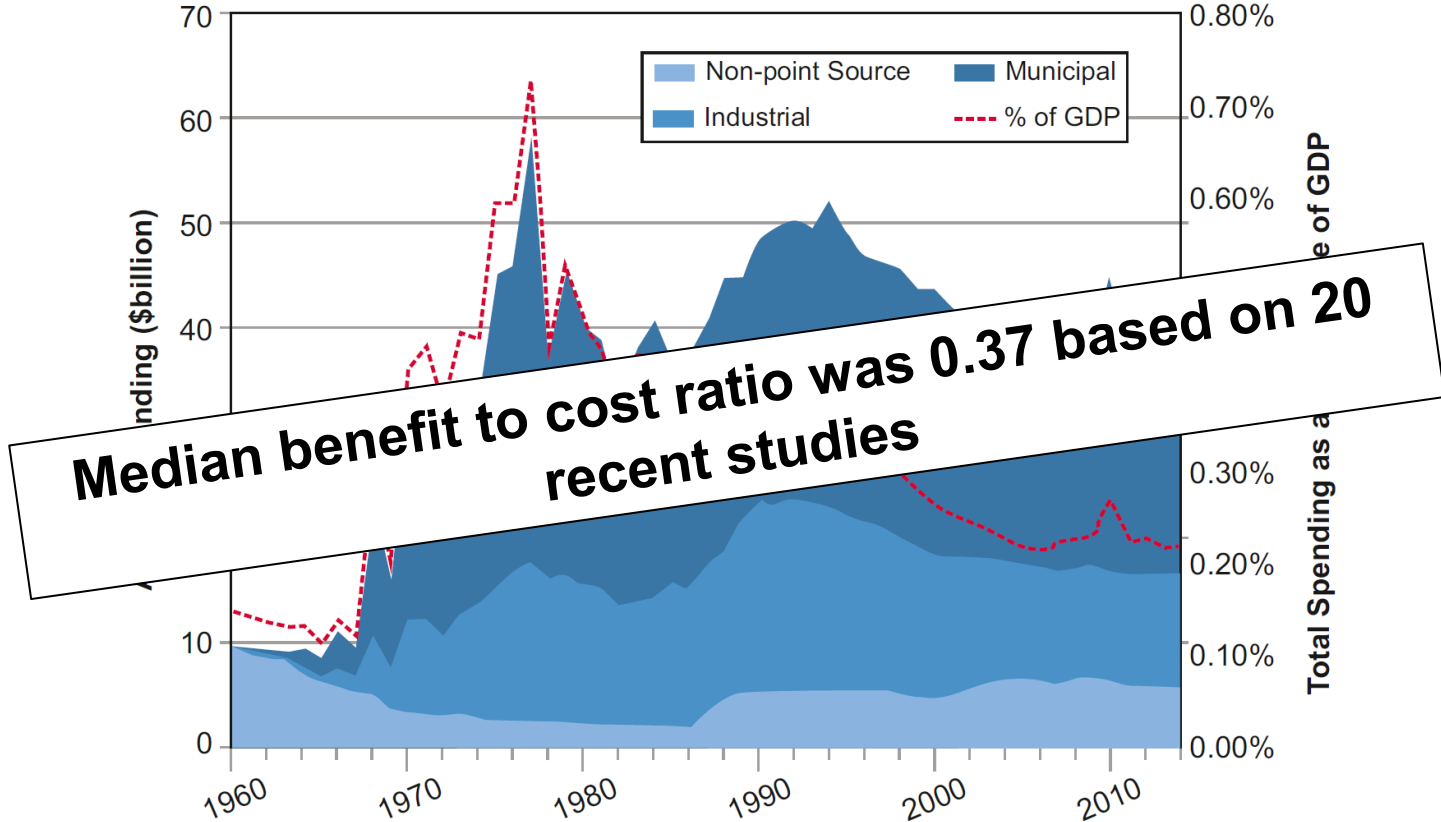
UNIVERSITY OF MINNESOTA

Roadmap

- I. **Policy Context: Clean Water Act turns 50**
- II. **Tools of Policy Analysis: How do we measure the benefits of clean water programs?**
- III. **Gaps, challenges, critiques: What is missing from our understanding of the value of clean water?**
- IV. **Future directions for water policy evaluation**



The U.S. spends a **LOT** of money on water quality



Keiser et al. PNAS 2018

We face ongoing threats to water quality



Report lists Mississippi as one of 'most endangered' U.S. rivers

Kirsti Marohn Brainerd, Minn. April 18, 2022 5:30 PM



A plane flies over the Mississippi River in St. Paul, Minn. on Aug. 1, 2017. ■ Evan Frost | MPR News 2017



Modernizing Regulatory Review

JANUARY 20, 2021 • PRESIDENTIAL ACTIONS

“fully accounts for regulatory benefits that are difficult or impossible to quantify”

“propose procedures that take into account the distributional consequences of regulations, including as part of any quantitative or qualitative analysis of the costs and benefits of regulations, to ensure that regulatory initiatives appropriately benefit and do not inappropriately burden disadvantaged, vulnerable, or marginalized communities”

BRIEFING ROOM

The Path to Achieving Justice40

JULY 20, 2021 • BLOGS

“Justice40 is a whole-of-government effort to ensure that Federal agencies work with states and local communities to make good on President Biden’s promise to deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities.”

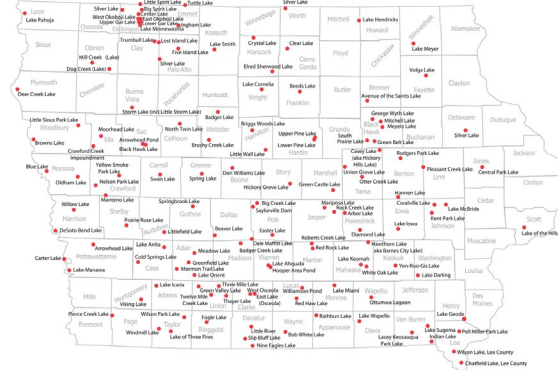
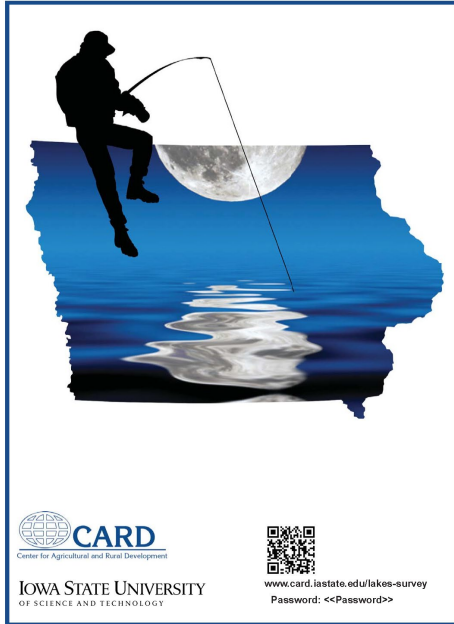
Are methods of policy analysis fit to purpose?



Water values as a special case



Revealed preference: Hedonics and travel costs



Hedonic Price Estimates of Lake Water Quality: Valued Attribute, Instrumental Variables, and Ecological-Economic Benefits

Michael R. Moore^{a,*}, Jonathan P. Doubek^b, Hui Xu^c, Bradley J. Cardinale^d

State your preference: What are you willing to pay for clean water?



Blue



Blue/Brown



Brown/Green



Green



Economic and Benefits Analysis of the Final 2008 Vessel General Permit (VGP)

The ballast water provisions of EPA’s final Vessel General Permit are expected to reduce the number of introductions of aquatic non-indigenous species (ANS) and thus may prevent significant future damages to fisheries, tourism, recreation, infrastructure, and human health, as well as further stresses on native biodiversity and ecosystems. Although estimating the monetary value of benefits from preventing future invasions with a reasonable degree of certainty would **not be possible due to the lack of data** on rates of invasive species introduction associated with ballast water releases, the type of species introduced in the future and the range of potential economic impacts associated with each species type is very large. The potential benefits of preventing the introduction of even one harmful ANS could be substantial.

CWA economic analysis: Lots of missing benefits

Table III-55: Scenarios 1 & 2 — Potential impacts, cost savings, and forgone benefits in the Case Study areas excluding the potential impact from states that may continue their baseline dredged/fill and surface water permitting practices

	Annual Avoided Costs (2018\$ millions)		Annual Forgone Benefits (2018\$ millions)	
	Low	High	Low	High
Lower Missouri River Basin				
CWA 402	not monetized	not monetized	not monetized	not monetized
CWA 404 Permit Application	\$0.27	\$0.27	N/A	N/A
CWA 404 Mitigation – Wetlands & Ephemeral Streams	\$1.41	\$5.51	\$0.13 ³	\$0.84
CWA 404 Mitigation -Water Quality	N/A	N/A	not quantified	not quantified
CWA 404 Mitigation-Reservoir Dredging	N/A	N/A	not quantified	not quantified
CWA 311 – FRP Requirements	not monetized	not monetized	not monetized	not monetized
CWA 311 – SPCC Requirements	not monetized	not monetized	not monetized	not monetized
SUBTOTAL	\$1.68	\$5.78	\$0.13	\$0.84
Rio Grande River Basin				
CWA 402	not monetized	not monetized	not monetized	not monetized
CWA 404 Permit Application	\$0.11	\$0.11	N/A	N/A
CWA 404 Mitigation – Wetlands & Ephemeral Streams	negligible ⁴	negligible	not monetized	not monetized
CWA 404 Mitigation -Water Quality	N/A	N/A	not quantified	not quantified
CWA 404 Mitigation-Reservoir Dredging	N/A	N/A	not quantified	not quantified
CWA 311 – FRP Requirements	not monetized	not monetized	not monetized	not monetized
CWA 311 – SPCC Requirements	not monetized	not monetized	not monetized	not monetized
SUBTOTAL	\$0.11	\$0.11		
Total 3 Case Studies				
TOTAL (Monetized Categories)	\$8.75	\$22.69	\$0.51	\$3.35

2019 Regulatory Impact Analysis, Clean Water Act Hazardous Substances Spill Prevention Final Action

In addition, as discussed above, this **analysis does not estimate benefits** for a prevention program (Proposal Option 2) or targeted prevention requirements (Proposal Option 3). The reason is that EPA is **unable to quantify** the extent to which risks of a discharge would be reduced or damages would be avoided because of new requirements.

Economic Analysis for the Navigable Waters Protection Rule: Definition of “Waters of the United States” (2020)

The agencies **did not model the potential impacts** of the final rule on reservoir sedimentation. As described above, higher sediment loads due to reduced wetlands could increase sedimentation in downstream reservoirs, but these potential effects are expected to be small given the minimal predicted 404 program impacts.

CWA economic
analysis: Preferences
of the rich matter
more than those of the
poor



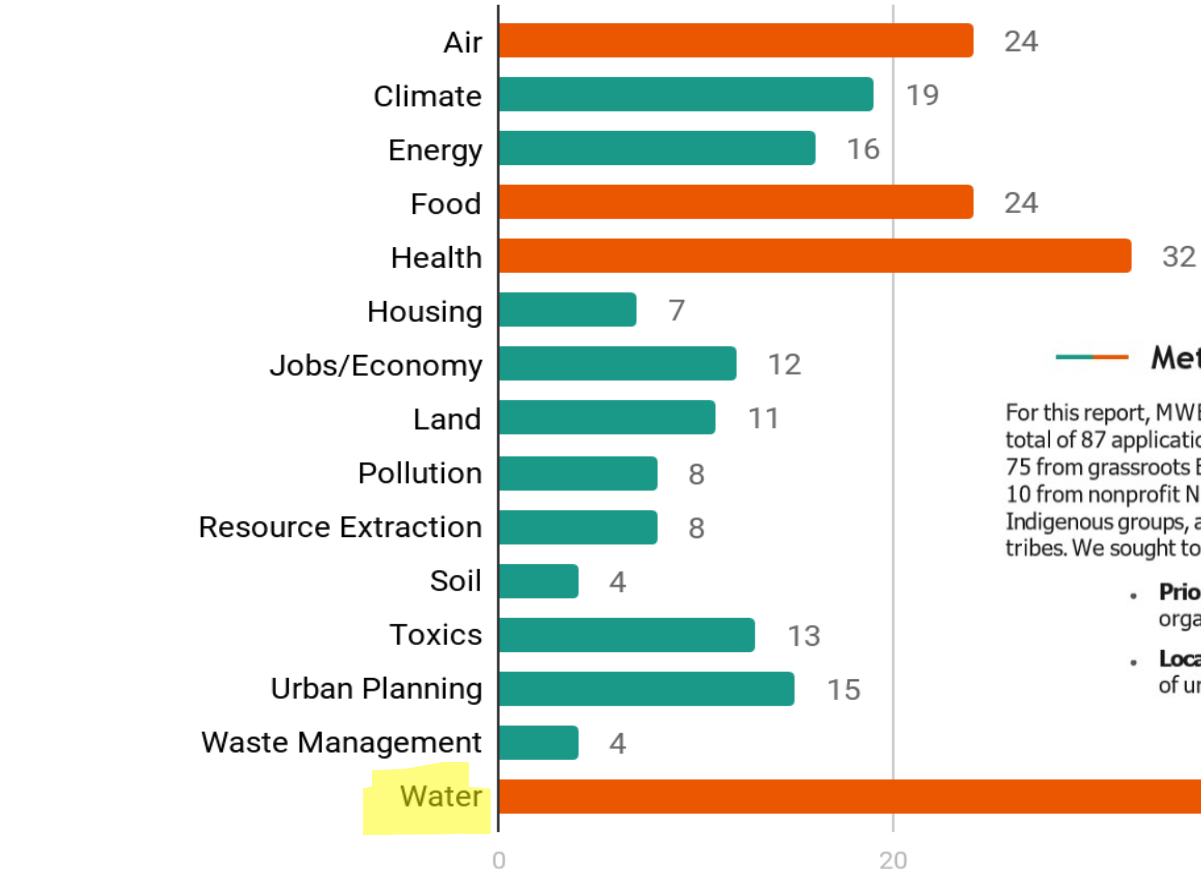
CWA economic
analysis: Not all values
are valued



No 16 Pilot's Knob & Mouth of the St. Peters River

REGIONAL ANALYSIS | Primary Issue Areas

Applicants were asked to check the three priority EJ issues for their communities. The top 4 issues are highlighted in orange. This data reflects all applicants, including tribes.



Methodology

For this report, MWEJN analyzed a total of 87 applications, with 75 from grassroots EJ groups, 10 from nonprofit Native and Indigenous groups, and 2 from tribes. We sought to understand:

- **Priority Issues:** What EJ issues are the most important for each organization's community?
- **Location:** Where are grassroots EJ groups located? What is the balance of urban and rural work represented?

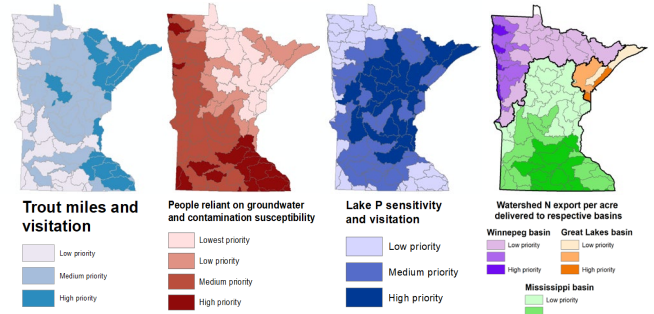


Different Methods -> Different Decisions?

The Value of Minnesota Water: A Resident Survey



Center for Changing Landscapes
UNIVERSITY OF MINNESOTA
 Driven to Discover™



Before you begin:

We are conducting this survey to better understand Minnesota residents' opinions about the value of water and actions that protect water. This survey is voluntary and confidential. It should take about 20 minutes to complete this questionnaire. Please answer the questions as so

Warming Climate

Melt + Precipitation

Recreation - Refuge

Resource Management

Natural Disasters

Human Connections

Employer/ Industries

Innovations

Future Connections

History + Cultural Connections

Unpredictable Change

Shipping + Estuaries



Concluding thoughts on the future of water benefits analysis

Quantify more benefits

Use a diversity of methods

Who decides if a policy is “good”? Technocrats or Bureaucrats?

