Perceptions and Water Quality

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Background

This research project aims at analyzing the relationship between perceptions and water quality at the individual level. We wanted to explore perceptions of recreation use, water quality policies, and housing values based upon current conditions of the lakes as well as under situations of hypothetical improvement and deterioration. The following research questions were investigated:

- How do people perceive water quality to affect the value of their home and the frequency of the activities that they take part in?
- In a community with impaired water quality, do people travel elsewhere in order to partake in water-related recreational activities?
- What factors influence the willingness of people to vote in favor of policies directed at improving water quality?

Methods

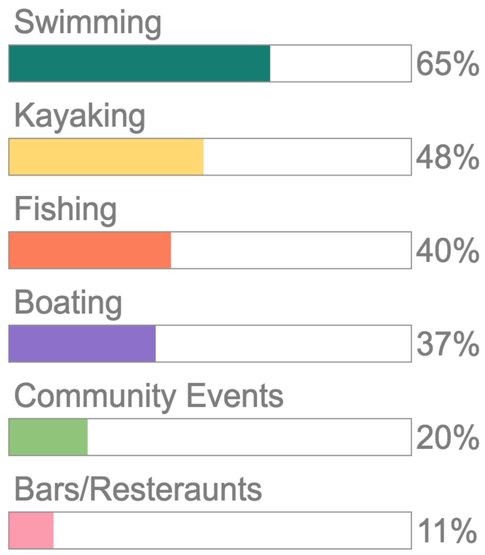
This study used a contingent valuation method to evaluate willingness to pay. A contingent valuation study typically involves asking participants to state yes or no if they would pay a certain amount for a particular policy. Our survey question was a bit more specific than this dichotomous method. We asked participants to rank, on a scale of "extremely likely" to "extremely unlikely", their willingness to pay for a policy to improve water quality at the $1, $10, $25, $50, $100, $250, and $500 levels. The survey was sent to a total of 852 households in the Chetek and Menomonie areas, asking a variety of questions related to recreation, willingness to pay, and other perceptions about water quality. The response rate was 21%, with 47% of these responses from Menomonie and 53% from Chetek. A random-effects probit model was used to transform the 178 responses into 1,246 observations in order to fit a regression model to describe the factors that influence an individual's willingness to pay. Additional figures were constructed based upon the answers to other questions from the survey.

Housing Value Perceptions

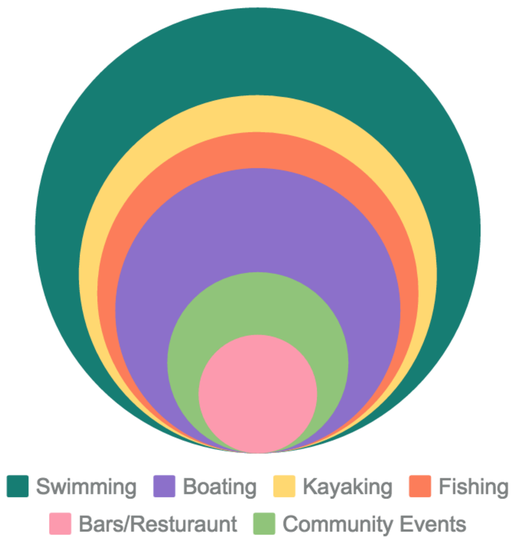
People responded that they would pay, on average, **11% more** for waterfront property if water quality **improved**.

People responded that they would pay, on average, nearly **15% less** for waterfront property if water quality **declined**.

Recreational Perceptions



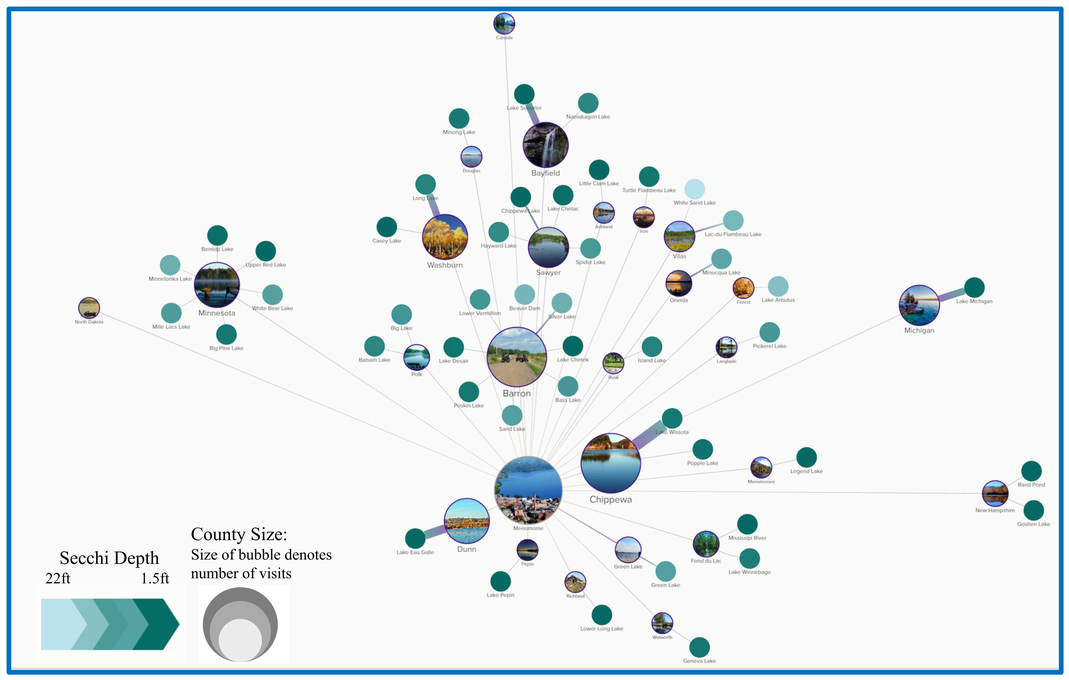
The figure above represents the percent of the population that would do these activities more frequently if the lake was cleaner.



The figure above represents the relative magnitude of how much more frequently individuals would do these activities if the lake was cleaner.

Mapping Recreational Outflow

78% of Menomonie respondents reported traveling to another lake within the past 12 months.



Willingness to Pay

Variable	Likelihood to Vote Yes per $1 Increase	P-value
Value	-3%	0.000
Swimming	108%	0.008
Income	4%	0.000
Access to Water	373%	0.008
Menomonie	262%	0.106
Permanent Residence	246%	0.157
Amount of Time Living in Area	-25%	0.606
Valuing Recreational Growth	110%	0.427
Legacy	-52%	0.384

The Random-Effects Probit Model created has a Pseudo-R^2 of .501187

Highly Significant	Moderately Significant	Surprisingly Insignificant
Access to Water	Menomonie	Amount of Time Living in Area
Swimming	Permanent Residence	Valuing Recreational Growth
Income		Legacy
Value		

Starting at the median value of $50, the average person's willingness to vote in favor of a water quality improvement policy…

… **decreases by 30%** for each additional $10 that the policy asks for.

…is **twice as high** for individuals that believe they would swim more frequently in a cleaner lake.

…is **373% higher** for people who have private water access on their property.

…**increases by 40%** for every additional $10,000 a household earns.

Conclusion

Our results are surprising, as factors that we hypothesized would affect someone's theoretical willingness to pay for water quality improvements, in fact, had little influence on the willingness that was revealed by the model above. People's perceptions and stated behaviors - from recreation, to travel, to housing value - do not align with the value that they place on water quality as revealed by this contingent valuation study. Further discrepancy between stated and revealed preferences is seen when this model is examined in conjunction with the hedonic evaluation component of this economic project.

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