The Impact of Water Clarity on Home Prices in Vilas and Oneida Counties, Wisconsin

A HEDONIC STUDY

Dr. Thomas Kemp, Sisi Zhou, Shangqian Wu, Megan Roehl, Eric Winkler | Department of Economics

EXECUTIVE SUMMARY

This study estimates the residential property value gains associated with improvements in water clarity on 60 Northern Wisconsin lakes. Using a two-stage hedonic model applied to Wisconsin DNR water clarity data and data associated with 271 residential home sales obtained from Zillow.com and County property records. We conclude that a one (1) meter improvement in water clarity would produce a $8,090.87 - $33,171.12 improvement in the market price of an average residential property on a lake within the study area. We also conclude that in addition to water clarity the main non-housing attributes that drive property value in the region are the local tax rate and the distance to a public airport.

PURPOSE

There exist a significant number of lakes in Northern Wisconsin that exhibit low levels of water clarity. It is also a well-established fact that perceptions of water quality and water clarity have a significant bearing upon residential property values. It is the case that an improvement in water clarity on those lakes that currently exhibit low clarity would result in a significant improvement in property values. (Not to mention a number of other economic benefits such as increased tourism.) Rising property values also means increased property valuations and – potentially – State and local tax revenue. On the other hand, improving water clarity is not without costs. The matter is therefore a balancing act: In cases where the economic benefits exceed the costs associated with water clarity improvement there is a clear case to be made for said improvements.

STUDY AREA

Vilas and Oneida Counties in Northern Wisconsin have, in total, well over 300 lakes that are greater than 100 acres in area. The two counties are sparsely populated with the majority of residents living directly on or very near a lake. The region is also distant from a metro area. The nearest – Wausau, WI – being roughly 62 miles away from Oneida County and one-hour drive time. It is safe to say that the lakes themselves, and the leisure activities associated with them, constitute a major economic driver for the region. Should the lakes not be properly maintained or damaged in some way, it would result in significant economic loss to the area.

QUICK Q & A

Q: DOES THE CLARITY OF LAKE WATER HAVE AN IMPACT ON HOME PRICES?
A: Yes, we find that home prices rise as water clarity improves. Using actual home sales data, we find that within Vilas and Oneida Counties that an improvement of water clarity by one meter would increase average home sale prices by 8 to 12 thousand dollars.

Q: HOW DO YOU DETERMINE THE CLARITY OF A LAKE?
A: We use Secchi disk readings averaged over the year in which the house was most recently sold to determine water quality. This has been shown to be the most reliable and objective measure.

Q: IS WATER CLARITY THE SAME AS WATER QUALITY?
A: No, our study measures the impact of water clarity, not water quality. Undoubtedly water quality also affects property prices but the perception of water quality (clarity) has the most significant impact upon property prices.

Q: HOW DO YOU DETERMINE THE CLARITY OF A LAKE WATER QUALITY?
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Q: ARE YOUR FINDINGS CONSISTENT WITH OTHER SIMILAR STUDIES?
A: Yes, although our findings differ somewhat from other similar studies, they are within the expected ranges.

RESULT

On lakes where water clarity is fairly low (about 1 meter), gaining one meter of clarity will improve home values by about 10 -12% (Roughly 23-26K in this case). On lakes where water clarity is currently high the benefits to a single family home sale prices associated with improved water clarity would result in a significant improvement in property values. There is a clear case to be made for said improvements.

METHOD

HEDONIC REGRESSION ANALYSIS

A hedonic model was used to estimate changes associated with a change in a specific home attribute, using actual home sales data. Similar methods are used to determine the change in home value associated with – for example – a bathroom update. Using regression analysis, we are able to statistically isolate the marginal value of structural, locational, and environmental attributes. Attributes with estimated positive coefficients have a positive impact on property prices, while attributes with negative coefficients have a negative impact on property prices.

DATA

Water clarity data was obtained using Wisconsin DNR reports for 60 Northern Wisconsin Lakes. For our purposes we use the reported objective measure – Secchi Disk readings. Secchi disks are used to measure the maximum water depth at which an object may be observed from the surface.

Housing sale prices and attributes for 271 properties were taken from the website Zillow.com, including square meters of living space, sale date, lake frontage, fireplace, number of bedrooms and bathrooms, basement, deck, garage, lot size, local tax rate, and lake area. The prices and attributes of all houses and vacant properties sold in the years 2014-2018 over the study area were used.

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