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Title: Estimating the Demand for Protecting Freshwater Lakes from Eutrophication

Authors: Kevin J. Boyle, P. Joan Poor, and Laura O. Taylor

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Abstract:

This study uses the hedonic price model to determine the demand for lake-water clarity in four real-estate market areas in Maine. Water clarity is a key indicator linked to eutrophication since algae blooms reduce the water clarity and are common to eutrophicated lakes. This model uses the lowest water quality values taken during the summer months when eutrophication is most likely to manifest as an algae bloom. Lakefront property sales for 25 lake in Maine between 1990 and 1995 were used in the hedonic model. The Maine Department of Environmental Protection provided the water clarity data.

The Maine Department of Environmental Protection has determined that 3.0 meters of clarity is the threshold that determines whether or not a lake has compromised water quality. This matches the result of one type of demand, showing that this threshold is also important to public preferences. One of the demand types utilized in this study also shows that the benefits of protecting water clarity exceeds the gain by improving a poor level of water clarity, which matches assertions made by liminologists that it is cheaper and easier to protect a lake's clarity than to try to restore it later. The results show that the average visibility for all Maine lakes is 3.78 meters; for lakes without compromised water quality, visibility is 5.15 meters; for lakes with compromised water quality, visibility is 2.41 meters. If the clarity improved from 3.78 to 5.15 meters, the benefit ranges (depending on demand type) from \$3,677 to \$3,765. If the water clarity were to decrease from 3.78 to 2.41 meters, the losses range from \$25,388 to \$46,750. In other words, the benefit gained by protecting water clarity from diminishing is several times greater than any effort to improve the clarity. The hedonic price model used in this study is also found to be accurate with expected sign changes and statistical significance.