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**Title:** The Travel Cost Model for Lake Recreation: A Comparison of Two Methods for incorporating Site Quality and Substitution Effects

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**Abstract:**

This study focuses on comparing two methods of applying the travel cost model to predict the behavior of recreationalists when presented with a water quality improvement. This paper focuses specifically on how accurately behavior can be predicted when considering how substitute sites and site quality characteristics affect the travel cost model. It presents a travel cost method to account for these changes and tests it against an alternative method, representing a more traditional travel cost method that lacks consideration for substitute sites.

The method used in this paper states that recreators based their decision to visit a lake on two separate choices: whether or not the individual will participate in a lake recreational activity and which lake they will visit if they decide to participate. In other words, the goal of this model is to predict the probability of visiting a lake and then determining the probability of visiting a particular lake if they decide to visit one. This is determined by how desirable (in terms of water quality) and accessible the lake is to the recreationalist, but must also factor in the desirability and accessibility of alternative lakes within the area. Traditional travel cost models have not considered the effect of substitute choices. The water quality variable was measured using Uttormark's Lake Classification Index, which uses scientific, objective measurements to assign a numerical value to the lake. In addition, aesthetic values are important to recreators when they choose a site, so shoreline use was used to measure this, based on four levels of development.

This method was compared to an alternative method to estimate the change of visits to Shadow Lake in Northern Wisconsin if there was an one LCI unit of improvement in water quality. The method from this paper predicted a 12% increase while the alternative method predicted a 16% increase. When considering the total summer visits to Shadow Lake at 80,000 to 90,000, this can translate to a difference of 3,000 to 4,000 predicted additional visits between these two methods. The alternative method is inferior because it overestimates the number of visits due to its inability to consider how recreationalists would reallocate their visits amongst the lakes they choose from. This is dangerous to decision makers because they could decide to undertake rehabilitation projects they believe are economically justified when the benefits may be overstated.