

**SUPPORTING STATEMENT**  
**Estimating National Water Quality Benefits**  
**Focus Groups ICR 2205.19, 2090-0028**

May, 2016

**(1) Title of the Information Collection**

Estimating benefits of surface water quality improvements

**(2) Short Characterization/Abstract**

Improvements in the quality of water resources may provide a variety of benefits including improved recreational opportunities, healthier and better functioning ecosystems and wildlife support services, and reduced human health risks. The provision of those benefits is adversely affected by excess nutrients and sediment, toxic chemicals, heavy metals, and other types of pollution. Under the Clean Water Act, the EPA is required to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The EPA is required to perform benefit-cost analysis under several statutes and on economically significant rulemakings by Executive Order 12866. However, estimating the benefits of water quality improvements has proven to be particularly difficult due to the large scope, scale, and variety of water resources and water pollutants found in the United States.

There are a variety of non-market valuation methods capable of estimating the economic benefits of improving environmental quality, but only stated preference (SP) methods are able to capture both use and non-use values. While use values, such as those arising from recreational use of a resource, can be estimated by observing related market behavior, non-use values that arise from bequest motives, preserving the option for future use, and a sense of stewardship for the resource can only be estimated using SP surveys. Reliable SP surveys are often costly to perform and can take years to complete, making it impractical to conduct an original SP study for each regulation that requires a benefit cost analysis. Two other, more efficient approaches are to (1) conduct a national survey that can be applied to a variety of rules and (2) use meta-analytic approaches that transfer values from many different SP studies to the resource and regulation of interest.

Regarding the first approach, there have been two national level stated preference surveys undertaken. Carson and Mitchell (1993) employed a contingent valuation survey with water quality changes described by the water quality ladder to estimate the value people placed on boatable, fishable, and swimmable water quality. While groundbreaking at the time, the methods used in Carson and Mitchell are now considered out of date and the data are over thirty years old. Viscusi, Huber, and Bell (2008) used an iterative choice stated preference survey and water quality measured using the US EPA National Water Quality Inventory ratings (good or not good) to estimate the annual national value of water quality changes. The binary "good" versus "not good" description of water quality limits the applicability of the results since water quality improvements that do not lead to a waterbody crossing the "not good"/"good" threshold would be assigned zero benefits, when in reality such improvements may be valued by society. Additionally, neither study estimates or accounts for how WTP may decrease with distance from a water body.

EPA recently employed meta-analyses to estimate benefits of the Steam Electric Power and Construction and Development Effluent Guidelines. While the meta-analysis is able to draw on many high quality SP studies that are appropriate for benefits transfer, the state of the literature and the information available on the constituent studies limits the meta-analysis in several ways. First, the meta-data cannot be used to estimate how WTP for water quality improvements changes as distance from the affected resource increases. Second, it is not possible to distinguish the effect of improvements in quality on WTP from increases in the amount of surface water accessible to a given household. Finally, there is no allowance for WTP for improvements to waterbodies greater than 100 miles away from a household, which may lead to severe underestimation of the benefits for some waterbodies. A recently conducted SP study on the Chesapeake Bay provides evidence that WTP can be positive at greater distances, particularly for well-known and culturally important waterbodies (Moore *et al.* 2015).

The proposed study will be designed specifically to address these gaps in the literature providing a means to improve on the current meta-analysis methodology and possibly provide an alternative for estimating water quality benefits at a range of spatial scales from local to national.

This Supporting Statement provides background material for a request to conduct up to 12 focus groups and up to 24 one-on-one interviews as part of the survey development process. The number of focus groups and interviews actually conducted will depend on the rate of convergence of the draft survey instrument. The results from these activities will inform the design of a survey instrument. The focus groups and one-on-one interviews will not produce results that can be statistically analyzed to estimate willingness to pay for any outcome for any group or set of individuals. Instead, this exercise will aid in the design of a survey instrument for a later pre-test and full-scale stated preference study. However, implementing such a survey is beyond the scope of this ICR; any request for implementing a pre-test and full-scale survey will be made in a separate ICR.

### **(3) Need for the Collection**

Currently EPA relies on a meta-analysis of stated preference water quality studies to estimate national WTP. To address the meta-data limitations described above, EPA is forced to make several simplifying assumptions when using the meta-analysis to estimate benefits. For example, the analysis exogenously assumes that each household's WTP is limited to resources within a 100 mile radius, that there is perfect substitutability between water quality and quantity, and that all waterbodies are valued the same way by households regardless of notoriety or cultural importance. The goal of this project is to improve EPA's ability to estimate the benefits of proposed policies and actions and overcome the current benefit transfer limitations by:

1. Estimating a household WTP function that satisfies the adding-up condition and is suitable for valuing water quality changes at sub-regional, regional, and national scales.
2. Identifying a flexible distance decay function that can accommodate both use values (expected to be concentrated near the home) and non-use values (which may decay with distance less rapidly or not at all).
3. Allowing for imperfect substitution between water quantity and quality.

4. Allowing for diminishing marginal WTP for water quality improvements over a wide range of quality levels and spatial scales.
5. Estimating WTP differentials for water bodies of national significance.

The results of this project, in conjunction with several other initiatives to improve EPA's ability to value water quality changes (improved water quality modeling, for example), will provide a comprehensive assessment of the benefits associated with different environmental policies. It is critical that EPA invest in developing comprehensive WTP estimates for water quality changes in order to provide the most accurate and up-to-date information required to make sound regulatory decisions. This survey development effort will fill an important gap in the valuation of water quality.

The focus groups and one-on-one interviews that are the subject of this ICR are an important step in determining how to frame questions and design a survey instrument that can capture the value of improvements in water quality for use in benefit-cost analysis. Specifically, the focus groups and interviews proposed under the generic ICR will help establish a viable survey instrument, which will later be used (under a separate ICR) to estimate the values individuals place on water quality endpoints in ways that are consistent with micro-economic theory and benefit-cost analysis.

#### **(4) Non-duplication**

As described earlier, there have been two national level water quality stated preference surveys conducted in the past but, for reasons described in Section 2, neither is suitable for EPA's use at this point. This project will be developed by economists from EPA's National Center for Environmental Economics in consultation with economists and analysts from EPA's Office of Water and Office of Research and Development in order to assure that it is capable of meeting the Agency's critical future areas of need. The selection of specific water quality descriptions, endpoints, and valuation scenarios that will be the subject of the focus groups and one-on-one interviews will be informed by these consultations with the program offices. For these reasons, the results of this study are designed to be unique and not duplicative other efforts.

#### **(5) Consultations**

This is a new focus group request (not a renewal of an ongoing collection effort) so no periodic consultations with persons outside of the Agency have been conducted related to this effort.

This collection, or perhaps more likely, a survey instrument developed with the results from these focus groups, may be of interest to other Federal, State, and Local Agencies, as well as to the Office of Management and Budget. EPA will make a concerted effort to keep interested parties informed of progress as the survey instrument is developed, and will ensure that these parties are informed of any survey implementation.

#### **(6) Peer Review Plans**

Interim products such as focus group scripts and draft survey questions developed during this project will be subject to routine internal review by the EPA staff. The final product from these

focus group efforts is a survey instrument to elicit individuals' willingness-to-pay for changes in water quality – the precise nature of which will be informed in part by the focus groups. A report summarizing the main findings from the focus groups and one-on-one interviews will accompany the survey draft. External peer review is beyond the scope of this initial effort, but both the survey instrument and focus group report will be externally reviewed prior to any full-scale study.

**(7) Confidentiality**

The survey instrument will fully conform to federal regulations – specifically the Privacy Act of 1974 (5 U.S.C. 552a), the Hawkins-Stafford Amendments of 1988 (P.L. 100-297), and the Computer Security Act of 1987. Each prospective respondent will be informed that their participation in the exercise is voluntary. The identities of the individuals will be kept confidential by the investigators and not associated with their responses in any report.

**(8) Sensitive Questions**

There are no questions included in the survey materials on sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private or sensitive in materials.

**(9) Respondents**

Respondents will be members of the general public who volunteer to participate in focus groups and interviews. Participants will be recruited so as to provide adequate representation of the target population. See section 11 for more information on areas of focus.

**(10) Collection Schedule**

The project timeline depends on the results of the focus groups, as well as external constraints. The expected timeline for the data collection is as follows. Please note that these tasks may partially overlap; in particular, we allow for the possibility of some one-on-one interviews to be conducted prior to the completion of all the focus groups. Initial focus groups will likely be used to scope participants' understanding of concepts, explore the use of different water quality descriptions and to gauge the relative importance of certain water quality benefit categories.

Task:	Expected Completion Date:
Contact potential respondents	Start 2 Weeks from ICR approval (on a rolling basis)
Conduct Focus Groups	5 to 20 Weeks from ICR approval
One on one interviews with draft survey instrument	10 to 22 Weeks from ICR approval

**(11) Respondent Burden**

Participants for focus groups and individual interviews will consist of residents in several metropolitan areas across the U.S. Respondents may also be recruited from more rural areas

surrounding these locations. We plan to conduct up to 12 two-hour voluntary focus groups of approximately 10 individuals each. The respondent burden for focus groups is 240 hours. We also plan to conduct up to 24 two-hour one-on-one interviews to test draft survey instruments. The respondent burden for interviews is 48 hours. The total burden under this ICR is therefore 288 hours.

In summary, the (maximum) total burden for voluntary respondents consists of:

Focus groups: (up to) 12 groups \* 10 people/group \* 2 hrs per person = 240 hours.

One-one interviews: (up to) 24 people \* 2 hours per person = 48 hours.

For a total burden of 288 hours.

### **References:**

Carson, R. T. and R. C. Mitchell (1993). "The Value of Clean Water: The Public's Willingness to Pay for Boatable, Fishable, and Swimmable Quality Water." Water Resources Research **29**(7): 2445-2454.

Moore C, Guignet D, Maguire KB, Dockins C, Simon NB. A Stated Preference Study of the Chesapeake Bay and Watershed Lakes. National Center for Environmental Economics, US Environmental Protection Agency; 2015 Nov.

Viscusi, K. W., et al. (2008). "The Economic Value of Water Quality." Environmental and Resource Economics **41**(2): 169-187.