

## **Attachment 3 – Public Comments on Federal Register Notices and Responses**

### **A. First Round of Public Comments to EPA-HQ-ORD-2016-0632-0006**

**Open November 9, 2016**

**Closed January 9, 2017**

Commenters:

- 1) American Groundwater Association
- 2) Anonymous Public Comment

#### **Commenter 1: American Ground Water Association**

##### **Comments Regarding the Environmental Protection Agency’s Proposed Information Collection Request; “Willingness To Pay Survey To Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters”**

**Published on November 9, 2016 (81 FR 78809)**

**Docket ID No. EPA-HQ-ORD-2016-0632**

**Submitted by: National Ground Water Association, 601 Dempsey Road, Westerville, OH 43081**

**Submitted on: November 22, 2016**

#### **SUMMARY OF THE ACTION**

The Environmental Protection Agency (EPA) plans to submit an information collection request (ICR), “Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters” (EPA ICR No. 2558.01, OMB Control No. 2080-NEW) to the Office of Management and Budget (OMB) for review and approval in accordance with the Paperwork Reduction Act (PRA) ([44 U.S.C. 3501](#) *et seq.*). Before doing so, EPA is soliciting public comments on specific aspects of the proposed information collection.

EPA proposes a survey to collect data for a case study of changes in recreation demand and values due to changes in nutrients in northeastern coastal waters. This includes the development of methods and tools for estimating recreational values. The geographic focus of the survey will be Cape Cod, Massachusetts and New England residents within 100 miles of the Cape. This research can provide helpful socio-economic information to decision makers about the use of those waters.

Nonpoint sources of nutrients, in this case, nitrogen, lead to ecological impairments in estuaries, with resultant socio-economic impacts. The decisions needed to meet water quality standards are highly complex and involve significant cross-disciplinary challenges in identifying, implementing, and monitoring social and ecological management needs.

The revealed preference survey to collect data will focus on: People's saltwater recreational activities; how recreational values are related to water quality; how perceptions of water quality relate to objective measures; the connections between perceptions of water quality, recreational choices and values, and sense of place; and demographic information. EPA will use the survey responses to estimate willingness

to pay for changes related to reductions in nutrient and pathogen loadings to coastal New England waters. The results may inform decisions about meeting water quality standards.

### **BACKGROUND about the National Ground Water Association (NGWA)**

1-1

NGWA, the largest trade association and professional society of groundwater professionals in the world, represents over 11,000 groundwater professionals within the United States and internationally. NGWA represents three key sectors: scientists and engineers, employed by private industry, by the consulting community, by academic institutions, and by local, state, and federal governments, to assess groundwater quality, availability, and sustainability; water-well contractors responsible for developing and constructing water-well infrastructure for residential, commercial, and agricultural use; and suppliers and manufacturers responsible for providing the equipment needed to make groundwater development possible.

### **SPECIFIC COMMENTS of the National Ground Water Association**

1-2

The National Ground Water Association's comments address the validity of the methodology and assumptions used and the quality, utility, and clarity of the information to be collected. NGWA supports conducting the survey. NGWA's comments focus on the information and assumptions on which the survey will be based. From extensive research in New England and specifically on Cape Cod (for example, see: US Geological Survey. 2014. Science for the Stewardship of the Groundwater Resources of Cape Cod, Massachusetts. Electronic Publication fs2014-3067.pdf), the major source of nitrogen on Cape Cod is wastewater from septic systems. The nitrogen is carried by groundwater discharging to coastal waters. Willingness to pay for reductions in nutrient and pathogen loadings to coastal waters should also take into account that these nutrient and pathogen loadings are occurring to groundwater that is carrying these loadings to the coast and is a valued source of drinking water to residents and vacationers in New England coastal areas who could then use and value the services of cleaner coastal waters once nutrient loading is addressed and reduced. Reasonable options for survey respondents to consider should incorporate actions taken to reduce nutrient releases to groundwater that would be used as a source of drinking water.

The National Ground Water Association appreciates the opportunity to comment on this information collection request and survey.

For further information, please contact:

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National Ground Water Association  
301 Dempsey Road  
Columbus, Ohio 43081  
202-660-0060  
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#### Comment Submission Notes

Dates: Comments must be submitted on or before January 9, 2017.

Address: Submit your comments, referencing Docket ID No. EPA-HQ-ORD-2016-0632, online using [www.regulations.gov](http://www.regulations.gov)

For further information contact: Marisa Mazzotta, U.S. Environmental Protection Agency, Office of Research and Development, Atlantic Ecology Division, 27 Tarzwell Drive, Narragansett,

Rhode Island 02882; telephone number: 401-782-3026; fax number: 401-782-3139; email address: [mazzotta.marisa@epa.gov](mailto:mazzotta.marisa@epa.gov).

**RESPONSES TO COMMENT SET 1: AMERICAN GROUND WATER ASSOCIATION**

1-1 We thank you for taking the time to review our materials and provide comment. We appreciate your support of this work.

1-2 The American Ground Water Association effectively highlighted the environmental concern being considered in the study: nitrogen impairments from septic system effluent. We recognize the importance of groundwater carrying the loadings to coastal waters, and the resulting impacts on drinking water. These are, however, outside the scope of study for this work. Incorporating drinking water and groundwater questions would increase the length of the survey, thereby reducing our response rate and increasing the burden on the American public. We would be interested in pursuing these questions in future research.

## Commenter 2: Anonymous Public Comment

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**C Anonymous public comment**

The is a Comment on the **Environmental Protection Agency (EPA)** Notice: **Agency Information Collection Activities; Proposals, Submissions, and Approvals: Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters**

For related information, [Open Docket Folder](#)

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**Comment**

2-1 I am writing in support of the proposed data collection, which is a survey of coastal households in New England to understand their views on marine water quality and information on the respondents' last trip related to saltwater recreation in these states. I have read the draft survey as well as the Federal Register Notice. As a practicing environmental economist, I think their approach is sound both in terms of the statistical sampling design as well as the questionnaire and the use of a random utility model to model the willingness to pay for water quality improvements. They are modeling their approach after similar surveys done by EPA, NOAA, and academic institutions that dealt with similar subjects.

2-2 The use of a mixed mode approach (mail/web) is appropriate given that email addresses are not available from the Delivery Sequence file, but use of a web mode can cut down on survey costs both in terms of administering the survey and the respondent's time. I think their sample sizes are appropriate and the estimate of burden hours seems reasonable.

My recommendations are to keep the survey instrument as short as possible within the needs of the survey, and to streamline it as much as possible for use on the web.

These comments are mine alone and do not necessarily represent those of the NOAA or the Department of Commerce. No Agency endorsement should be inferred .

### RESPONSES TO COMMENT SET 2: ANONYMOUS PUBLIC COMMENT

2-1 We thank you for taking the time to review our materials and provide comment. We appreciate your support of this work and recognition of the validity of the research design, including the use of a mixed mode web/mail survey.

2-2 Following your recommendations, and standard practices within social science methodology, we have worked to keep the survey concise. Additionally, we are working with our contractor to make the questions appropriate for both web and mail surveys.

## **B. Second Round of Public Comments to EPA-HQ-ORD-2016-0632-0006**

**Open November 13, 2017**

**Closed December 13, 2017**

Comments are posted at:

<https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=postedDate&po=0&D=EPA-HQ-ORD-2016-0632>

In total, we received 23 comments. Eighteen anonymous comments are not relevant to our study and instead provide general opinions about various environmental issues, most of which are not related to water quality. Many of the comments appear to be intended for other rulemakings or actions. The following comments are included in this category, and therefore we do not provide responses:

- EPA-HQ-ORD-2016-0632-0013
  - EPA-HQ-ORD-2016-0632-0015
  - EPA-HQ-ORD-2016-0632-0016
  - EPA-HQ-ORD-2016-0632-0017
  - EPA-HQ-ORD-2016-0632-0020
  - EPA-HQ-ORD-2016-0632-0021
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  - EPA-HQ-ORD-2016-0632-0028
  - EPA-HQ-ORD-2016-0632-0029
  - EPA-HQ-ORD-2016-0632-0030
  - EPA-HQ-ORD-2016-0632-0032
  - EPA-HQ-ORD-2016-0632-0033
  - EPA-HQ-ORD-2016-0632-0034
- 
- One anonymous comment (EPA-HQ-ORD-2016-0632-0014) does mention a survey, but does not give specific points that can be addressed with regards to our research. The comment focuses on policy issues that are beyond the scope of our work. The nitrogen issue in New England is primarily caused by stormwater and wastewater, rather than agriculture. We intend that the data from our survey will help communities decide how and where to implement policies to develop the most cost-effective solutions to nutrient pollution in New England, which is already required by law and being implemented under many total maximum daily load requirements. The comment is copied below.

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**C Anonymous Public Comment**

This is a Comment on the **Environmental Protection Agency (EPA) Notice: Agency Information Collection Activities; Proposals, Submissions, and Approvals: Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters**

For related information, [Open Docket Folder](#)

**Comment**

BEFORE GOING ON THIS EXPENSIVE LUDICROUS SURVEY ON PAYMENT THE ENTIRE REGION SHOULD BE ORDERED TO STOP USING ALL THE NITRATES ON FARM FIELDS THAT ARE BEING USED, AS WELL AS ALL THE PESTICIDES, HERBICIDES THAT AGRICULTURAL BUSINESSES, GOVERNMENT AGENCIES LIKE MOSQUITO CONTROL AND OTHER ROAD DEPTS TO STOP USING ALL THESE TOXIC CHEMICALS. WE NEED A COMPLETE REDUCTION IN ALL THE USE ON LAWNS AND ON FARMS OF CHEMICALS AFFECTING GROWTH OF PLANT LIFE. THIS HAS BEEN OVERDONE IN THE USA FOR FAR TOO LONG. WE HAVE BODIES OF WATER ALL OVER AMERICA GOING GREEN WITH ALGAE, THE FISH ARE DYING, ETC. WHY CANT WE GO ORGANIC MORE? WHY ISNT THERE A DEMAND THAT WE GO ORGANIC. WHY ISNT THERE A LAW FOR THE REGION THAT STOPS NITRATE USE ON FARMS AND LANDS. WE KNOW WHAT IS CAUSING THE CRAP IN THE WATER. WE NEED LAWS TO STAMP OUT AND PUT IN JAIL THOSE WHO ARE CAUSING IT. THAT MAKES MORE SENSE THAN THIS NONESENTIAL SURVEY. THIS COMMENT IS FOR THE PUBLIC RECORD.

**Document Information**

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Tracking Number: 1k1-8zrl-6bho

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- Comment EPA-HQ-ORD-2016-0632-0018, on behalf of the Utility Water Act Group, requested a 60-day extension of the comment period. See attached pdf letter. We elected to close the comment period as scheduled, due to the tight timeline for completing the survey during the summer season in 2018.
- Comment EPA-HQ-ORD-2016-0632-0019 is from T. Smythe and is copied below, along with our responses to the commenter's suggestions:

Dear EPA colleagues,

Thank you for taking the time to study citizens' opinions of coastal water quality in New England and how citizens use coastal areas for recreation. There are not nearly enough data or studies, particularly social data such as the kind you are collecting, addressing this topic, and therefore you are addressing a significant need. Your survey results will be extremely helpful in informing management decisions and particularly how we allocate limited resources to address coastal water quality problems.

Your two surveys are very well designed and I offer just a few minor/specific suggestions in the interest of improving them. I hope these suggestions will help improve your survey response rate and the quality of data you collect.

For both surveys:

1. Your survey design is busy and very overwhelming visually. I worry this will affect your response rate. Can you introduce more white/dead space on each page? Maybe use fewer boxes? Question numbering also overwhelming, can you simplify? (why "3.16.A" why not just 1, 2, 3, 4....)

**Response:**

The survey will be conducted as a mixed-mode survey, with the intention that most respondents will opt to answer the online version, which will present a much cleaner interface than is possible on paper. We considered adding more white space to the pages, but this would increase the

number of pages, making the survey seem longer to respondents, and increasing printing and mailing costs significantly.

2. In your Likert scale questions about the importance of place - What about places connected with "important memories" that are not family related? I have a lot of those and am sure I'm not alone. Can you make the question more general?

**Response:**

We appreciate this comment, and will remove the word "family" from the question about "important memories."

3. In your transportation questions - change "airplane" to something more general that includes both planes and helicopters. A fair number of coastal recreators use helicopters to travel between locations.

**Response:**

We include an "other" category where people can write in other types of transportation, such as helicopters.

For the general recreation survey:

1. Use of term "fin fishing" - in our experience this term is not understood by a lay audience to be as general as I think you mean it. Suggest simplifying to just fishing.

**Response:**

We have changed "fin fishing" to "fishing" in the 2 questions where this term appears. Our original intent was to distinguish between fin fishing and shellfishing.

For the shellfishing survey:

1. You are using the term shellfish to address crustaceans too (lobsters, crabs). In our professional experience we have found this distracting to those who know that shellfish and crustaceans are different. Can you define the term "recreational shellfishing" early in the survey to make clear that this is shorthand for broader suite of activities?

**Response:**

In our focus groups, we did not find this terminology to be an issue, so have opted to keep the term "shellfishing."

2. Why at some point do you start excluding lobsters? I found it distracting. Can you explain this in the survey somewhere?

**Response:**

We have taken out the language excluding lobsters so that it is consistent throughout the survey.

Best of luck to you in your survey administration and your research more broadly. Thank you again for your efforts to study these important issues and address a significant data gap.

Very respectfully,

Dr. T. Smythe  
University of Rhode Island

- Comment EPA-HQ-ORD-2016-0632-0031 is from Barnstable Clean Water Coalition, copied below and attached in letter form. The comment expresses support for the survey. No response is required.

This is a Comment on the **Environmental Protection Agency (EPA)** Notice: [Agency Information Collection Activities; Proposals, Submissions, and Approvals: Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters](#)

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Due Dec 13 2017, at 11:59 PM ET

### Comment

December 12, 2017

To: OMB Desk Officer for EPA

Re: Comments Regarding Docket ID Number EPA-HQ-ORD-2016-0632 - Information Collection Request (ICR) Submitted to the Office of Management and Budget (OMB) for Review and Approval; Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters

On behalf of Barnstable Clean Water Coalition, we are pleased to provide this letter of support for the EPA Office of Research and Development's Information Collection Request, "Willingness to Pay Survey to Evaluate Recreational Benefits of Nutrient Reductions in Coastal New England Waters (New)"

Barnstable Clean Water Coalition, works to restore and preserve clean water in the town of Barnstable on Cape Cod. The Coalition utilizes science as its foundation to educate, monitor, mitigate and advocate for clean water. Our mission merges science, technology, community stewardship and environmental conservation, all while working with other like-minded non-profits; local, state and federal resource managers; and scientific institutions.

The estuaries and bays surrounding the Cape are significantly impaired, mostly from excess levels of nitrogen and other contaminants flowing into them from upstream sources and groundwater discharge. The degradation of our coastal waters is not only scientifically measurable, but anyone who has spent time on the water recently has noticed the changes. We know how important clean water is to our health, environment, and especially, our local economy.

The Coalition strongly supports the proposed new EPA survey of recreational benefits of nutrient reduction in coastal waters of New England.

Regards,

Zenas Crocker  
Executive Director  
Barnstable Clean Water Coalition  
zcrocker@bcleanwater.org

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Tracking Number: 1k1-90b2-m6b4

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### Attachments (1)

- Comment EPA-HQ-ORD-2016-0632-0035 is from Utility Water Act Group, and is attached as a pdf. Our responses to their comments are below:

We appreciate the comments and suggestions from Dr. Desvousges and Ms. Michael.

The commenters first raised some general issues:

#### 1. Recall bias:

- a. "...we have concluded that the proposed research design and the supporting questionnaire contain substantial flaws. Chief among these is the substantial risk of recall bias in the questionnaire design, which causes both the extent of recreation participation to be over reported and the number of trips to be exaggerated."
- b. "One of the most significant problems is the substantial risk of bias in people's recall of past trips, especially after periods as long as one year, because respondents are more likely to overestimate use and levels of participation."



- c. "...to the extent that questions require differing lengths of recall, further potential for error arises. Using different recall periods for different questions in the survey, as this survey does, is likely to make it much more difficult to reliably link together the information collected across several survey responses."

**Response:**

UWAG's comments express concerns for recall bias, assuming that recall bias will lead to overestimates of both participation and the number of trips. They state that this is their chief concern with the questionnaire. While we, too, are concerned with recall bias, we do not believe that recall bias will result in substantial flaws or issues for our survey and its intended uses, as detailed below. This issue is further addressed in responses to comments on specific survey questions.

Our review of the literature, including studies cited in UWAG's comments, shows that recall bias is not consistently found to be an issue and is also not consistently found to result in overestimates of participation. Fisher et al. (1991) note that existing literature at the time demonstrated mixed results regarding recall bias. "The dominant effects, telescoping and memory decay, work in opposite directions. Telescoping brings events into the recall period from other times and tends to produce overestimates. Memory decay ... tends to produce underestimates.... The literature suggests that memory decay dominates the recall of routine activities, and telescoping dominates the recall of more significant events (Fisher et al., 1991, p. 368)." In their recall study they did find that "in general (but with some notable exceptions), longer recall periods are associated with larger estimates (Fisher et al., 1991, p. 371)." These differences varied by activity and avidity of the participant, with no consistent systematic bias that could be used to correct estimates.

The NMFS report by Andrews et al. (2014) cited by UWAG does not address recall bias, but compares a mail survey to telephone survey and finds that the mail survey results in 4.1 times higher estimates of fishing effort than the telephone survey (for the same 2-month wave), which the authors conclude is more accurate due to the mail survey being less susceptible to non-response and non-coverage bias. The National Academies of Sciences review of NMFS recreational fishing surveys states "Limited documentation is available on the historical decision to set 2 months as the recall period ... other than methodological studies conducted in the 1970s that suggested a recall period longer than 2 months would result in unreliable estimates (NAS 2017, pp. 53-54)." The panel recommended that NMFS conduct further research on issues related to recall.

Osborn and Matlock (2010), in a study in Texas, found that the estimated number of saltwater boat fishing days per year was not significantly different when estimated with a 1-year vs 1-month recall period, though the 1-year recall estimates had larger standard errors.

Contrary to what is stated in UWAG's comment, Connelly and Brown (2011) found that estimates of overall fishing effort from three 3-month surveys and a single 12-month survey differed by less than 10 percent, and that the *shorter* recall period resulted in *higher* estimates.

Their abstract states:

"For the overall state-wide estimate of fishing effort, the estimate from the three-phase survey was slightly greater than from the 12-month recall survey (the opposite of what was hypothesised). For the major water bodies, the differences were mostly significant but not always in the same direction

between the two survey methods. Different results from one study compared with many others do not mean that past recommendations for shorter recall periods should be abandoned. However, the strength of this study – that the implementation methods (i.e. mail surveys) were identical – leads one to be more sceptical of past results (Connelly and Brown, 2011, abstract).”

They also report that the cost of conducting a three-phase survey was 2.4 times greater than the cost of a single 12-month survey, and deemed the 12-month survey to be more cost-efficient based on their results.

In our study, estimating the total annual number of recreation trips is not the primary purpose of the survey. There are other existing estimates that are useful for this, including NOAA’s recreational fishing surveys and their recent coastal recreation survey, and the National Survey of Recreation and the Environment. We are most interested in summertime participation rather than total participation over the course of an entire year, as summer is the prime season for coastal recreation in New England, as well as the time of year when nutrient pollution is most likely to be an issue for recreational water quality. UWAG’s comments state that recall over 2-3 months has been found to be reliable to estimate the number of participants and trips. Because we are primarily interested in summertime participation, we plan to conduct the survey in late summer of 2018, which will be within the suggested recall window to capture summertime visits, in accordance with current generally accepted practices and UWAG’s recommendation.

Because our main interest is in summer participation, and because a 2-3 month recall period is generally accepted in the current literature, we separately ask for visits by season in the survey, rather than for the whole year. If the survey is conducted in late summer, as anticipated, we will be within the 2-3 month window for summertime estimates. Estimates for seasons other than summer will be used to proxy avidity in our random utility model (RUM).

Concurrently with this survey work, we are conducting other research that develops and applies a variety of methods to estimate participation in coastal recreation. These methods and studies will provide additional data on participation, unrelated to the survey, that can be used in cross-validation studies.

UWAG’s comment mentions a potential issue with “differing lengths of recall.” It is not clear exactly what they are referring to, but each survey question that asks for recall of specific items has a different and specific purpose in the survey, as explained question by question in our supporting statement.

## 2. Water quality perceptions

- a. “We have also identified numerous problems in the research design as it relates to the relationship between perceived and technical measures of water quality. We have concluded that EPA has failed to acknowledge important research on this topic, much of which was supported by the Agency itself. There is also insufficient attention devoted to the lessons learned from other revealed preference approaches, such as property value studies, which have evaluated this relationship.”

## Response:

We have put considerable thought and effort into the issue of perceptions of water quality versus objective measures, and are conducting concurrent research to advance knowledge in this area. We did not describe this in great detail in the supporting statement because we did not consider that level of detail about complementary research to be appropriate for the ICR. We are currently working on a literature review paper summarizing the literature on water quality perceptions, so we are very familiar with this literature.

It is not clear exactly what UWAG is suggesting in terms of lessons learned from property value studies, but we are extremely familiar with this literature as well. In previous work for EPA, Dr. Mazzotta conducted a review of 44 property value studies that address water quality (Mazzotta et al., 2010). We have also reviewed more recent studies, and Dr. Mazzotta is task lead for a current research project within EPA's Office of Research and Development that includes several hedonic studies that evaluate water quality. The research from hedonic property value studies is complementary to the recreational valuation work that we are proposing. While some hedonic studies ask people about their perceptions of water quality and try to determine whether the changes evaluated are actually perceived by home buyers (for example, Ramachandran 2015), the vast majority of this literature simply assumes that a positive and significant coefficient on water quality indicates that people perceived and considered water quality in their purchase decision. Many hedonic studies focus on water clarity, which we found in focus groups to be one of several important ways that people evaluate water quality.

With regard to objective measures of water quality, we are concurrently conducting an extensive research effort into ways to gather consistent measures of coastal water quality at a fine enough spatial scale to capture differences across water access points. We are collecting four categories of water quality data: nutrient loadings and concentrations, bacteria loadings and concentrations, clarity, and color/chlorophyll. We are gathering data using several approaches – loading data, monitoring data, closure data, satellite data, and other coastal data sources. In a separate and complementary research effort we will work with other ORD researchers to develop an interpolated spatial “surface” for water quality that can be linked to coastal access points. This effort is much more detailed and comprehensive than anything that has been done to date, and involves a number of water quality and spatial modelers at EPA and elsewhere. It will allow us to test hypotheses regarding water quality perceptions and their relation to objective measures, as well as provide measures linked to access points to include in the RUM.

- b. “In addition, one of the crucial modeling challenges in the extrapolation of the survey responses to evaluate recreational benefits of nutrient reductions will be to link the water quality measures to the respondents' perceptions of water quality. The EPA Support Statement indicates: “there is also little known about how people's perceptions relate to actual water quality measures” (p. 5).

We strongly disagree with this statement. This particular topic has been the focus of considerable attention in the economic research literature since the early 1980s, including substantial amounts of research sponsored by EPA itself. Vaughan and Russell (1982) conducted a seminal study in which they linked technical water quality measures to a water quality ladder that portrayed levels of water quality that would support various recreation activities. This water quality ladder, or subsequent variations of it, were featured in studies conducted by Desvousges, Smith and McGivney (1982), Smith, Desvousges and Fisher (1983) and Mitchell and Carson (1982). The ladder proved to be a

highly effective visual device for communicating the linkages between water levels and recreation activities.”

**Response:**

The water quality ladder was an important innovation for communicating the linkages between recreation activities and the water quality problems faced in the 1980s. However, the water quality ladder does not apply nearly as well to today’s nonpoint source nutrient challenges. We considered using the water quality ladder as a potential approach to evaluating people’s perceptions, but natural scientists in our office immediately pointed out to us that the categories of use depicted and their ordering on the ladder are not necessarily relevant to nutrients or consistent with the categories of changes caused by nutrient impairments. For example, the water quality ladder includes categories of use – boatable, fishable, and swimmable – that are not particularly relevant for nutrient pollution. A body of water can be impaired by nutrients and still technically support all three categories of use. However, *quality* of use and therefore WTP per day is likely to be affected by different levels of nutrients in a water body. Other offices within EPA are currently working on approaches to replace the water quality ladder with a new water quality index that more accurately reflects current water quality issues.

Second, while the categories of the water quality ladder have been related in many studies to actual water quality metrics, the categories themselves do not effectively capture the small variations in water quality that we are attempting to evaluate, which are most likely to result from nutrient reduction policies (e.g., TMDLs) in New England. Most studies using the water quality ladder evaluate categorical changes (from “boatable” to “fishable” or “fishable” to “swimmable”). While early applications of the Clean Water Act applied to point sources and recent policies such as those dealing with combined sewage overflows have produced these kinds of large categorical changes, current issues are most often related to nonpoint sources and more marginal water quality changes in specific locations (Herriges et al., 2015).

- c. “There was also considerable attention paid to the relationship between perceived and technical measures of water quality by other researchers using different approaches. Needleman and Kealy (1995) focused their research on swimming in New Hampshire and the role played by water quality. Parsons and Kealy (1992) conducted one of the first random utility model (RUM) studies addressing the relationship between water quality and people’s recreation choices. The research on the relationship between technical and perceived levels of water quality continues to be investigated in more recent research, including work by Silva (2014). EPA should invest some resources in understanding the findings of this early research to better inform its current research design. One of the clearest lessons learned from this early research is that survey respondents need to be able to perceive relative differences in water quality in order for such measures to be included in a recreation demand model.”

**Response:**

We are familiar with most of the literature mentioned in UWAG’s comment. Most of the studies mentioned deal with water quality in lakes. There are few that address water quality perceptions as compared to objective measures in coastal waters. Needleman and Kealy (1995) apply a RUM model for swimming in lakes, with three water quality measures – a dummy variable for mesotrophic or eutrophic status, a dummy variable for whether “the lake has a bacteria problem,” and a dummy for whether the lake has “an oil and grease problem.” They do not estimate a relationship between perceived and objective measures. They state: “By using the objective policy variables, we avoid having to establish links between the subjective measures and changes in the policy variables (Needleman and Kealy 1995, p. 83).” Similarly, we will use objective

water quality measures (as detailed in our response to comment 2a above) in our RUM model. But, we will go a step further and estimate another model that relates people's subjective water quality perceptions to actual measures for the location visited, in order to test the hypothesis that people's perceptions correspond to objective measures. In fact, the modeling and testing of a relationship between subjective and objective measures is one of the most important components of our study. This model will help us to determine which objective measures of water quality (if any) most accurately reflect people's perceptions. Our results should provide useful and needed information for future water quality valuation studies in coastal areas.

Parsons and Kealy (1992) used levels of dissolved oxygen and water clarity in their RUM. They do not address perceptions of water quality, but make the assumption that their water quality measures will account for the ways people perceive water quality when choosing a lake. Neither the Needleman and Kealy (1995) study nor the Parsons and Kealy (1992) study conclude, as the commenters suggest, that "survey respondents need to be able to perceive relative differences in water quality in order for such measures to be included in a recreation demand model." As far as we can tell from their papers, neither study confirmed through empirical results that people actually perceived the measures they used. We intend to determine the relationship between people's perceptions of water quality and objective water quality measures in the current study, as described in our supporting statement.

We appreciate the reference to Silva's (2014) MS Thesis, of which we were unaware. Silva's study does explore the relationship between perceived and actual water quality, for lakes in Utah. Silva found that, while biophysical measures of water quality were not significant in his demand model, perceptions of water quality were significant. He was able to develop an ecological production function relating biophysical measures to perceptions and to estimate demand using this linked model. We plan to explore similar approaches, applied to coastal waters.

- d. "The proposed survey is not designed to ensure that respondents will be able to perceive such differences in water quality. If changes in water quality, such as the level of ammonia or bacteria, cannot be observed, they will not affect respondents' choices of a recreation site. Alternatively, if EPA and its researchers intend to use objective measures of water quality in their models, there must be a link between the objective measure and the respondent's perception of water quality. This critical link is missing from the proposed study.

The supporting documentation cites Phaneuf (2002) as an example of a study that uses objective watershed level water quality measurements as an explanatory variable in the RUM model to explain site choice. Although these measures of water quality may potentially reflect the changes in water quality from proposed regulations, if the public cannot perceive such measures, there will be a fundamental disconnection with the choices recreators make."

#### Response:

As described above, we intend to model separately the connections between water quality perceptions and objective measures of water quality. The survey is designed precisely for the purpose of testing the relationship between perceptions and objective measures, which is one of our most important research questions. This is something that has not been done consistently in past studies.

We do not agree that people can only have perceptions about that which they can visually observe, but this is an empirical question that we intend to test. We found in focus groups that many people do have perceptions related to bacteria, based on closure or swimming advisory data

for a site and clues in the landscape, such as the extent and type of development or presence of a nearby wastewater treatment plant.

In the survey, we have a series of questions to elicit water quality perception data. We include a question on overall perception of water quality, followed by a question asking how sure the person is about their rating. We then ask for perceptions regarding the most important set of variables that people in focus groups mentioned as affecting their perceptions – seaweed, algae/scum, bacteria, clarity, muckiness of the bottom, oil or gas sheen, odor, and trash. These questions will help us identify which factors were considered by, and most important to, an individual in deciding their overall quality rating. Finally, we ask whether the respondent feels the water is of adequate quality for various uses. This question is intended to elicit their perceptions of whether the water quality is sufficient for various designated uses. All of these questions are designed to link to policy-relevant variables. In addition, we ask respondents to rate the water quality at the worst and best place where they have participated in coastal recreation in the past 5 years. These questions will provide additional data points for our model of perceived versus objective water quality measures, and may also be used to normalize their rating for the last trip location.

- e. “Finally, objective measures of water quality are often correlated with each other, which may create multicollinearity, leading to estimation problems. For example, water clarity, nutrient levels and oxygen levels are all related. The levels move in the same direction. When water has high nutrient levels it will often have algae growth leading to less clarity and lower levels of oxygen. Including all of these factors as variables in the same model may result in unreliable estimates of the influence of each of them individually.”

**Response:**

We are well aware that many water quality variables are correlated, and do not intend to include a set of correlated variables in a single model. We will apply generally accepted statistical methods to first test for correlations; and will test models that use a water quality index that combines multiple metrics, models using individual water quality metrics, and models using results from our separate model of perceived/actual water quality. This, too, is an empirical and statistical question that we intend to examine through our research. It is also worth noting that since water quality variables are often correlated, many water quality improving policies, such as storm water management, affect the set of variables together. Disentangling the components may not be necessary in all cases.

- f. Special attention should be paid to the model’s sensitivity to alternative modeling of perceived water quality. Different assumptions used when modeling this variable can result in significantly different estimated values. For example, Michael et al. (2000) found that different variables based on different assumptions about perceived water clarity resulted in very different values for changes in water clarity. Consequently, the authors recommend that the selected measure of the environmental variable should be based on conceptually and theoretically sound logic and reflect the public’s perceptions of environmental quality. It is unclear from the supporting statement that the researchers have given sufficient consideration to this important point.

**Response:**

We completely agree that it is important to apply “conceptually and theoretically sound logic and reflect the public’s perceptions of environmental quality.” As described above, we have considered these issues extensively and are currently writing a review article of existing studies that address water quality perceptions. We also intend to model separately the relationship

between perceptions and objective measures to test which objective measures are most closely related to perceptions, in order to inform the RUM.

3. Question wording and ordering

- a. "...we have identified numerous problems in the wording of various questions and in the scales that are proposed to measure perceptions."

**Response:**

We appreciate the detailed comments on survey questions, and discuss individual questions below. It seems that the reviewers based their comments on an earlier survey version—the version posted with the first Federal Register notice rather than the most recent version posted with the second Federal Register notice. Thus, we had already made a number of the changes suggested by the commenters, and the question numbers listed in the comments do not match the current question numbers. See below for specifics.

4. Use of revealed preference and RUM modeling

- a. "EPA's decision to approach assessment of the benefits of nutrient reduction in Cape Cod's waters using a revealed preference approach to estimate WTP has the advantage of being based on people's actual behavioral choices, rather than simply statements about what they would do. To obtain the potential advantages of this approach, however, the underlying data collection must meet the highest standards of reliability. Moreover, the data collection must be sufficiently linked to the requirements of the WTP models that EPA and its researchers intend to use."

**Response:**

We agree completely with this statement, and believe this survey will meet reliability standards for its intended use, which is evaluation of decisions related to implementation of the Clean Water Act, specifically decisions concerning implementing Total Maximum Daily Loads for coastal waters.

**Responses to comments on individual questions:**

1. The Cover of the Questionnaire contains pleasant pictures about coastal recreation and should encourage people to participate, but the pictures on the inside of the cover do just the opposite. While the language asks how clean or dirty the water is, both pictures are unpleasant. Inclusion of at least one positive and one negative picture would help present more balance. Also, on this page, it indicates what poor water can do, but does not really explain what good water can do. Again, for the sake of balance, it would be useful to paint both sides of the picture.

**Response:**

We have eliminated the entire page mentioned in this comment.

2. Page 1: Question 1.1: This question has a twelve-month recall period. The potential for bias here is more limited in that people only have to remember whether they did something, not how many times. However, people may have a more difficult time remembering trips from earlier in the year. Additionally, it's unclear what time frame the last twelve months will cover if there is a sufficiently long lag in the survey data collection. People who respond to the first wave of the data collection could be answering for a different time frame than those in the last follow-up. If the intent is to link technical data on water quality for specific time periods, this difference could be significant.

#### Response:

We recognize the potential for recall bias with a 12-month recall period. However, we do not believe that recall bias will be a problem in the context of our intended uses of the data from this question. Our first intended use of this question is to screen respondents for those who have participated in saltwater recreation in the past 12 months. We limited this to 12 months to address possible recall problems with remembering a “last trip” in later questions. Most people should be able to recall whether they have engaged in any saltwater recreation in the last 12 months. In our focus groups, we did not encounter anyone who had trouble with this question.

Those who have not participated in coastal recreation in the past 12 months are directed to skip to the end of the survey so that we can collect demographic information. For those who have participated, we are most interested in the number and variety of activities they have participated in over the past year (as a measure of avidity) and whether they engage in activities with water contact or not (to help test the hypothesis that people who have contact with the water are more likely to care about water quality), rather than precise estimates of every individual activity. The number of activities included in the list resulted from focus groups, where people consistently wanted more activities added to be sure that their favorite activities were accounted for. In our focus groups, we found that even people who infrequently participate in coastal recreation had good recall because the activities were so enjoyable for them.

The second part of the comment reflects, rightly, a concern about when the survey is conducted and what 12-month period will be covered. Our intention is to conduct the survey beginning in late July or August of 2018, so that respondents will be answering the survey in August or early September, at the end of the New England summer recreation season. So, everyone in the sample will be recalling a similar period of time, with a slight variation depending on whether they respond immediately or after multiple reminders.

3. Page 2: Question 1.2: This question asks people to develop an estimate of all their saltwater recreation trips for an entire year. This question is subject to very substantial risk of recall bias. As noted earlier, there is important research on recall bias comparing the last three months with the previous twelve months. The longer time periods lead to overestimation in the number of trips and people giving more weight to their recent trips that they remember better vs. their earlier trips. The use of differing periods of time—weekly, monthly, or seasonally—further compounds the problem by introducing different anchoring points with different potential for bias across respondents depending on the estimation. This format is a bad idea and will create substantial measurement error in a critical question. Even if the total number of trips is not specifically used for modeling purposes, these types of data, if collected correctly, could be useful for planners, as well as for possible use in benefits transfer where data on the total number of trips are often severely limited. A better alternative for collecting reliable annual data would be to stagger the survey over the course of the year and ask people to recall the number of trips that they took in the last three months. Of course, the most preferred and accurate measure would be in the last month, but three months is the time period used in the NMFS salt water fishing survey. Finally, the difference in recall periods would severely limit attempts to compare results for fishing from this survey with those from the NMFS survey. While the staggered approach would lead to some increase in costs, the tradeoff in better accuracy would likely be worth the investment.

#### Response:

See our general response above regarding recall bias and the findings in the literature.



We agree that data on total participation is very useful for planners and benefit transfer and that, ideally, the survey would be conducted in waves. However, our main purpose is to value a day of saltwater recreation, particularly for those who participate in water-contact recreation, and to see how values vary with changes in water quality, not to estimate total participation. Therefore, we have made the tradeoff of conducting a larger sample of summertime users to get the more important data for a range of users and locations across variations in water quality rather than a smaller sample done in waves. In New England, very few people (other than surfers) engage in water contact recreation in the colder months. Also, water quality issues tend to be more pronounced and important in the warmer months.

Because we are most interested in summertime recreation, we believe that this survey will capture accurate data for the summer months (which will be within the recommended 3-month window of recall). We are not as concerned with precise estimates for the other seasons, for the reasons mentioned above.

We appreciate the comment about use of different time periods for reporting use estimates, and tried asking this question in several ways in our focus groups. What we found was that focus group respondents who were avid users had a hard time with per-month or per-season estimates; but those who only engage in saltwater recreation once in a while did not know how to answer for a weekly or sometimes even monthly time period. After much trial and error and testing in focus groups, we settled on this form of the question. We are aware that this question is different than the format that has been more typically used “In the last xxxx how many times have you participated in \_\_\_\_\_?” and have made a conscious choice to elicit the information in the less common format.

Our intention is to use the data from this question primarily to gauge avidity of use rather than to estimate precise levels of effort, although it is unclear whether our question wording would perform better or worse than the more typical count wording version. As mentioned, NOAA has a highly-respected survey that estimates recreational fishing effort. For other coastal recreation, there are other existing surveys that estimate total participation, including the National Survey of Recreation and the Environment and a recent National scale survey by NOAA on coastal recreation participation and expenditures.

4. Page 3: Question 2.1: This question asks respondents to provide the date or an estimate of the date of their most recent salt water recreation trip. The primary concern here in asking people about the date of their last trip is whether that trip was in any way typical of the trips during the year, or whether it was unique in some way. In addition, there is a potential for collecting information that is more seasonal in nature depending on the timing of the survey. That is, if it’s during the summer, the most recent trip is likely to be very different than a fall or winter trip. Finally, the options for estimating the dates seem cumbersome and could lead to coding issues. Would it not be easier to simply have the respondents provide the year and month of their trip, if they cannot remember the specific date? One also wonders about the accuracy of someone whose most recent trip is years ago.

**Response:**

We have revised this question in the more recent version (which was not reviewed by the commenter, as noted above) to ask for the month and year of the most recent trip rather than a specific date, as suggested by the commenter. We agree that the accuracy for people whose most recent trip is years ago would be a problem. However, question 1.1 screens respondents to include only those who have participated in the last 12 months. All others are directed to skip to the end

of the survey. Therefore, if people follow the skip pattern (which will be automatic for the online version), we will only get trips within the past 12 months.

The comment mentions that there could be an issue with asking for the date of the most recent trip because it might have been an atypical trip. Asking for data on the most recent trip is the typical approach in the literature. The comment mentions that there is a potential for collecting information that is seasonal in nature. As mentioned above, our primary focus is intended to be summertime trips, so we are hoping to collect in-season data.

5. Page 3: Question 2.2.A: This question asks people to estimate their one-way travel distance and travel time. The accuracy of this information will depend heavily on people's ability to recall their last trip. Another alternative would be to simply ask them to provide their Zip code, or this information may be available as part of the sampling frame. If one has the Zip code, it is relatively straightforward to estimate travel time and distance using standard travel models, such as PC Miler.

**Response:**

In the current survey version this is Question 2.7A. We agree that this information may not be accurate, and we do ask for people's zip codes and intend to use that information to calculate travel distance. As we detail in our Supporting Statement: "While we will calculate an objective distance measure with Google maps Application Programming Interface (API) (see section 5b of the Supporting Statement), we need self-reported distance as a verification check on the geolocation of the recreation spot, which is based on Question 2.3A, as well as to test whether perceived and actual distances vary consistently in people's perception of travel cost. In addition, for trips within the same town, where the location in 2.3A and their home are too close to distinguish from the provided answer, this allows for an estimate of travel cost. We also need respondents' estimation of perceived travel time, since this is a function of traffic. Traffic causes travel time to vary widely in this highly-developed corridor of the northeast. Because we do not believe we can collect the date and hourly departure/return time for each respondent accurately to use Google's travel time estimation in real-time traffic, we therefore plan to rely on reported travel time for attributing costs to the trip. This piece of information will also give us additional verification data to confirm the geolocation of the recreation location in Question 2.3A." Lastly, should we not be worried about whether objective measures of travel time and distance correspond to perceived time and distance as a cost? This is a parallel problem to the objective/perceived water quality issues. In fact, this perceived cost of travel in the choice model is the key to all the rest of the analysis and would affect our estimates of WTP for water quality as much as anything else.

6. Page 4: Question 2.3.A: This question elicits the mode of transportation for the most recent trip. Again, the accuracy here would be tied to the recentness of the trip.

**Response:**

This question is now 2.6A. See previous responses regarding trip timing. This question will be used to estimate cost per mile.

7. Page 4: Question 2.4.A: This question elicits the size of the party. While this question is often asked, it is unclear how useful it is for modeling purposes unless the intent is to estimate a household WTP vs. that for an individual. In that case, this question would not be very clear because people could be from multiple households.

**Response:**

As stated in our supporting statement, the purpose of this question is to split travel costs among adults traveling together. It will also allow us to control for the type of recreation trip, based on the hypothesis that people traveling with children may have a different choice process when choosing recreation activity and location. We are intending to estimate individual rather than household WTP, and therefore need to know how many individuals are in the group.

8. Page 4: Question 2.5.A: This question elicits the activities the respondent engaged in on the most recent trip. There are several issues that arise with this question. First, other members of the household could have engaged in different activities than the respondent, but this question would not capture that information. Second, wildlife viewing and birding are not assumed to take place on the shore compared to other near water activities. It is unclear why this distinction is being made. Finally, the accuracy of this information will depend on how recently the reported trip occurred.

**Response:**

This is question 2.12.A in the current version. We are eliciting a response and estimating WTP for the person answering the survey. While it would be interesting to know whether their family members or companions engaged in other activities, to ask for a list of activities for every member of the group would unnecessarily lengthen the survey and increase burden for little gain in usable data.

Birding and wildlife viewing were separated out as particularly important activities for many people in our focus groups and presumably in our sample. As the commenter correctly points out, we do not assume that these take place from the shore. Just as with fishing, many people engage in both birding and wildlife viewing either from the shore or from a boat. As we have not distinguished boat fishing from shore fishing, similarly we have not distinguished boat wildlife/bird viewing from shore viewing.

9. Page 4: Question 2.6.A: This question asks the respondent to identify the most important activity the respondent engaged in on the reported trip. The concern here is if this were a family trip, the most important activity for the respondent could have differed compared to other members of the family.

**Response:**

This is currently question 2.13.A. As mentioned above, we are intending to model WTP per day for the individual respondent and his or her primary activity, not for the entire family. While it would be interesting and useful to have information on every person and every activity, that simply isn't feasible without making the survey overly long and increasing the response burden inordinately.

10. Page 5: Question 2.7.A: This question elicits information about where people went on their trip. Several concerns arise with this question. First, respondents are likely to provide widely different information. People may refer to the same location by different names or they may just use a generic name. Secondly, the skip pattern is odd. If people don't know the town or city, it seems unlikely they would know the name of the place they went. Finally, it is unclear that people can differentiate whether something is tidal river vs. part of a bay, sound or estuary. It is also unclear why this question is being asked if people indicate the name of the place where they went.

**Response:**

This is currently question 2.3.A. In the online version, people will be provided with mapping functionality to pinpoint their location. We have revised the wording of this question in the newer version, so that some of the commenters points are no longer an issue. We no longer ask about the water body type, and have simplified the location questions. In focus groups, this question did reasonably well at specifying a location that we could identify. The information on state, town and place name, combined with distance traveled and data on water access points (collected separately in GIS files), should allow us to identify a location for most respondents' recreation trip. It is the best we could do given a paper survey where a map of the entire coast of New England is not workable, and failed to help elicit useful information in focus groups settings. We are hoping that the majority of respondents will choose to fill out the online version, thus allowing for more precise locations to be identified.

11. Page 5: Question 2.8.A: This question elicits whether the respondent has a parking pass, and then the following question asks about daily parking fees. It would seem that these two could be combined. It also seems like the number of times one used the parking pass is low value information and could be eliminated.

**Response:**

This is currently question 2.10.A and 2.11.A. We have included these questions to be able to add the daily parking amount to the trip cost. Many people in New England purchase seasonal passes to water access points, and for those people we want to estimate price per day.

12. Page 5: Question 2.10.A: This question asks how much contact the respondent had with the water. This question seems out of order and would have more naturally followed the question about the activities that were engaged in on the trip.

**Response:**

This is currently question 2.14A. The current version has rearranged the questions to ask this question after the activity questions, as suggested by the commenter.

13. Page 5: Question 2.11.A: This question asks how much time the respondent spent on site. This is a standard question for use in estimating a respondent's time on site. The main concern here is how much time has lapsed since the respondent's trip, which affects the respondent's ability to recall the specifics of that trip.

**Response:**

This is currently question 2.9A. See previous responses. We are anticipating that the majority of trips in our sample will be within the previous 2-3 months, thus lessening recall issues.

14. Page 5: Question 2.12.A: This question asks how often the respondent has gone to that place in the last twelve months. It provides several ranges of choices as to the number of times visiting. There are two concerns here. The first is the twelve-month recall problem discussed above. Second, the scale is introducing another source of measurement error in the reporting of trips because people are given the chance to round off their estimates. The primary problem with this scale is that it differs from the one

used earlier for the total number of trips. It also may complicate any comparison of the answers between the two questions.

**Response:**

This is currently question 2.5.A. We ask how often the respondent goes to this location to understand experience and familiarity with the site. Thus, we are not wanting a precise measure, but a sense of familiarity with the location. We plan to compare perceived and objective water quality measures, and experience with the location is an important factor. While we could ask this question in the same way as the previous total trip question, it would increase the time required to answer without adding sufficiently important data.

15. Page 6: Question 2.13.A: This question uses a 1-10 scale to elicit respondents' perceptions about water quality, on average, at this site. The 1-10 scale is relatively standard. However, the 0 endpoint, which is described as "dangerously polluted," is unnecessarily inflammatory language. This wording could easily be replaced with language that is parallel to the other end of the scale, which is described as Best Possible quality. That alternative would be "Worst Possible Quality." It is possible that people might find the "on average" wording somewhat confusing. "Typically" would be another alternative.

**Response:**

This is currently question 2.15.A. In the most recent version, we have changed the language used on the scale, no longer using the phrase "dangerously polluted," but instead using "worst possible quality," to parallel the use of "best possible quality" for the other end of the scale. We found the language, "on average" to work in focus groups and are hesitant to change it at this point, to something that has not been tested.

16. Page 6: Question 2.14.A: This question asks for respondents to rate the certainty of their water quality rating in the previous question. This is relatively standard.

**Response:**

This is currently question 2.16.A. This will be used in the analysis of perceived versus objective measures of water quality capturing experience and confidence in respondent's assessment of water quality.

17. Page 6: Question 2.15.A: This question asks for respondents to rate the usual condition of various aspects of water quality. The most serious problem with this question is that respondents are asked to rate the bacteria in the water as one aspect. This is an impossible task because bacteria cannot be seen. Even if you are only interested in a person's perceptions, this rating is nonsensical. Another concern is the use of the adjective "infested" for both algae and bacteria. Again, this word is unnecessarily inflammatory. The other end of the scale is present, so "widespread" would be consistent with use of "absent." Finally, the potential confusion caused by the use of usual water quality in this question and on average in the previous question is worth noting. Moreover, it may be beneficial to probe exactly what time period is being considered and other information the respondent is using as the basis for their perceptions.

**Response:**

This is currently question 2.17.A. We agree that bacteria cannot be seen. However, respondents in focus groups frequently mentioned bacteria, because bacteria levels are monitored at public

beaches monitor bacteria, and the information is often posted at the beach or access point, listed in local newspapers, and even reported on the local news when closures occur. Therefore, many people infer levels of bacteria at a location from the number of closures or swimming advisories that occur at that location as well as from clues in the landscape, such as the level of development near the shore or the presence of a wastewater treatment plant or stormwater outfall nearby. While many people in focus groups did say that they are unable to judge bacteria at a particular location and therefore answered “don’t know” for the bacteria question, others were aware of bacteria issues at local beaches and wanted to note that as a concern when discussing their perceptions of quality. Our initial focus groups asked open-ended questions about the factors people consider when judging water quality, and the list included in this question, including “bacteria” was developed from these responses. We agree that the word “infested” was not the best choice, and have changed it to “widespread” in the case of algae and seaweed and to “excessive” for bacteria.

18. Page 7: Question 2.16.A: This question asks for another water quality rating applied to the suitability for various activities. This question uses yet another scale—only 3 points, “poor, ok, and good.” This scale choice is problematic. It is not consistent with the previous question. It also does not allow for water quality to be any better than good. At a minimum, one would have expected four choices with excellent being the upper end of the scale. Finally, there is no language indicating whether this rating should be based on usual conditions, an average, or another alternative not yet used.

**Response:**

This is currently question 2.18.A. The intent of this question is to evaluate perceptions of water quality for designated uses, as a way to compare our perception data to the standard water quality ladder. Water quality for designated uses is evaluated as either sufficient or insufficient. Hence, if the quality is okay or good, a use is provided. We have modified the language to indicate usual conditions of the water.

19. Page 8: Question 2.17.A: This question elicits people’s feelings toward the site they visited, which could be problematic because they are somewhat vague and repetitive. I am assuming that these are part of some standard scale that is used to try to discriminate among people’s sense of place. The supporting statement indicates that the questionnaire was tested using focus groups. However, there was little substantive information provided as to the lessons learned from these group sessions. Such lessons would be especially critical for the sense of place questions and scales, which are far more experimental. We are concerned that there may be confusion about the intention of such questions. Moreover, the list seems longer than necessary.

**Response:**

This is currently question 2.19.A. These questions gauge the respondent’s place attachment, place identity, and place dependence, the three components of sense of place. The questions and scales are drawn from the sense of place literature. We have shortened the list of questions in the current version to remove some repetition and keep only the most relevant scales. People in focus groups were able to answer these questions. The primary issue with these questions occurred for those who had not visited a particularly special place on their last trip. This led us to add the open-ended follow up question (2.20.A), which allowed people to say things like “I only went to that place because my family dragged me there,” or “that is not one of my favorite places but was the last place I visited.”

The commenter's letter expresses support for the inclusion of sense of place questions: "The impact of place attachment on recreators' reactions to changes in the quality of a natural site is an interesting research question. Moreover, including information about a respondent's sense of place attachment may add explanatory power to the choice model. However, it is unclear whether such measures would affect people's choice of a recreation site, or their decision to participate in water-based recreation in the first place. Finally, given the lack of a track record of including such measures in a RUM model, there would seem to be some risk that people's sense of place may be intertwined with their perceptions of water quality, which could confound the interpretation of the model's results. We would urge that EPA proceed with considerable caution in undertaking such research."

We believe we have tested these questions and refined the list to a set that is working well. Part of our research is to explore the use of sense of place measures as explanatory variables in WTP models, as well as to explore how sense of place may affect water quality perceptions. There is little existing research on these topics, and therefore these questions should make an important research contribution. It is an empirical question whether sense of place will affect recreation participation and site choice, and one that we will test. We also have concerns about including sense of place in a RUM model and, again, intend to test this as a research question. And, we intend to estimate a wholly separate water quality perceptions model that will compare perceptions to objective measures, and will test the inclusion of sense of place to see whether that has any influence on perceptions. There is some anecdotal evidence for this, but it has not yet been empirically tested.

20. Page 8: Question 2.18.A: This question asks what is most important about the place they visited. One can guess that this answer is likely going to be conditioned by going through the list of statements in the previous question.

**Response:**

This is currently question 2.20.A. See response to previous comment. As noted above, many people did not consider the last place visited to be particularly special and wanted a way to explain that. Hence, the open-ended question. This satisfied those people, and therefore served a useful purpose in the survey.

21. Page 9: Question 2.3.B: This question asks about mode of transportation. However, in the case of an overnight trip, the distance traveled may be longer so it may involve multiple modes of transportation. It would be preferable to know the distance traveled using each of these modes.

**Response:**

This is currently question 2.5.B. We believe that adding distance traveled by each mode would be too cumbersome. Also, as mentioned above, we intend to calculate distance traveled using Google maps Application Programming Interface, and the self-reported distance is primarily for verification of distance traveled.

22. Page 9: Question 2.5.B: In addition to the number of nights spent away from home, it is important to know the number of days spent recreating at the site. Two nights away could mean one day recreating or three days. This would be useful to know before asking question 2.11.B: "How many of the days of this

trip did you participate in saltwater recreation?” It would allow you to know what portion of the trip was spent recreating at the saltwater versus doing other things.

**Response:**

This is currently question 2.8.B. The purpose of this question is to attribute a portion of trip costs to a single day of recreation on that overnight trip. The following questions ask about only one recreation day on that trip, and we plan to estimate WTP just for a single day of an overnight trip, not for each day of the trip.

23. Page 10: Question 2.8.B: This question asks about the proximity to water of overnight accommodations. It would be appropriate to include one or more categories after “Waterfront” or “Water View.”

**Response:**

This question is not included in the current version.

24. Page 10: Question 2.9.B: The question is “How often do you go on vacation or an overnight trip to this place,” which assumes those are the only two choices. But this may be a place to which the respondent makes day trips in addition to overnights. If you only want information about overnight trips, clarify that you only want them to count those trips.

**Response:**

This is currently question 2.4.B. We have changed the question to read “In the past 5 years, how many times have you gone on vacation or an overnight trip to that place?” This is to gauge familiarity with the place. It is true that they may also take day trips to that place, but we’re specifically interested in overnight trips in this question because this will be useful information for our partners, who are concerned with tourism. Question 2.17.B asks how many times the person has been to the saltwater recreation place in the past 12 months.

25. Page 10: Question 2.11.B: This question asks “How many days of this trip did you participate in saltwater recreation?” This question is missing the word “in” between participate and saltwater. Before this question, it would be useful to learn how many days respondents spent in total on the trip, so that you can identify what portion of the days were spent participating in saltwater recreation versus something else.

**Response:**

This is currently question 2.14.B. The wording has been changed to “How many days of that trip did you participate in your most important activity?” We do ask for the total nights on the trip in question 2.6.B.

26. Page 10: Question 2.12.B: This question asks how many hours were spent participating in salt water recreation. This question will be very vulnerable to recall bias.

**Response:**

We have deleted this question in the current version.



27. Page 11: Question 2.17.B: This question collects information about where respondents went on their trip. Again, the inclusion of the word vacation broadens the scope of the trip. Simply using “overnight trip,” which is the focus, would avoid confusion. In addition, there is no option for capturing more than one location on an overnight trip. People may travel to a location that has multiple beaches or saltwater sites for recreating. They may go to the beach one day, kayak on an estuary one day, and picnic at a state park the next.

**Response:**

This is currently question 2.15.B. It is unclear why adding “vacation” is an issue. Our thought is that some people go on an overnight trip that is not a vacation (e.g., business trip or family visit), and some go on vacation, so we are trying to cover the bases for potential types of trips. To keep the scope of the survey feasible, we have chosen to focus on only a single day during an overnight trip rather than trying to capture every day and activity for an overnight trip, which would make the survey much too long and burdensome for respondents.

28. Page 12: Question 2.19.B: This question asks the mode of transportation to get from where respondents stayed overnight to where they recreated. “Public Transportation” can be a wide-ranging category. Respondents may tend to think of it as a bus, trolley, shuttle, light rail, etc. There is no category for individual public transport, such as a taxi or Uber. This would have a different level of cost than a public bus or shuttle.

**Response:**

This is currently question 2.18.B. We have assumed that taxi or Uber would be included in the “car/truck” category. We haven’t seen this as a separate category in other surveys.

29. Pages 12 - 15: Questions 2.17B - 2.30.B: It seems the survey should have a way for respondents to answer about different places visited on the same trip or to provide information for each day they went to that location because the activities and contact with water could be different. However, this could be burdensome for the respondent.

**Response:**

These are currently questions 2.15.B to 2.30.B. We agree that it would be great to collect all this information, but feel it would be too burdensome to ask respondents to answer for every day and activity and therefore decided to ask people to select the last time they did saltwater recreation on that overnight trip, to minimize burden and collect information for a single day to parallel the single day questions.

30. Page 16: Question 3.1: This question asks the respondent to identify the location visited that has the worst water quality. There are no specifications about time frame for this question. Yet, below in Question 3.2, the survey asks how many times they have gone there in the last twelve months. It is not clear whether EPA is assuming that the place they indicate is some place they have visited in the last twelve months. The respondent could share something they remember from their childhood or many years past that could currently have vastly different water quality. This question could also be difficult to answer for many because people typically don’t choose to recreate in places that have bad water quality. It may help to add “relative to other areas” after WORST water quality.

**Response:**

The purpose of this and the following questions is to add context to the respondent's water quality evaluation for their last trip based on their best and worst, which may help us to normalize those responses across respondents. It also gives us two more observations per person for relating perceptions to objective measures. We have added "in the past 5 years" to keep people focused on the near-term. We have chosen not to add "relative to other areas" because this is implied in the formatting of the survey, and how people interpreted this in focus groups. We think it unnecessarily adds words.

When asking how many times they have been to that place in the last 12 months, we allow a "0" answer.

31. Page 16: Question 3.2: This question asks about the frequency of visits to this location. The first option "First time going there" doesn't belong in the option list. We recommend using 1 for this first trip to the site.

**Response:**

We have changed the wording of this question in the current version to include 0 and 1 as options.

32. Page 17: Question 3.4: This question asks about the best water quality location for saltwater recreation. Again, we recommend that this question specify BEST water quality "relative to other places you have visited."

33. Page 17: Question 3.5: Same comment as #32.

**Response:**

See response to comment 30 above.

34. Page 17: Question 3.7: This question asks for the furthest distance the respondent would travel on a single day to a saltwater recreation site. It doesn't seem that this hypothetical question will produce a useful unbiased result. There are no stipulations around this hypothetical trip. Respondents could imagine possibly traveling great distances to a world-class location even if they have never done so and never intend to. Rather than use a hypothetical, it would be better to ask about a real trip, such as, "what is the farthest you have traveled in the last year for saltwater recreation?"

**Response:**

This is question 3.9 in the current version. The purpose of this question is to test alternative choice set definitions in the RUM model, by including sites within the specified distance as potential substitutes. Therefore, we are trying to learn the potential size of the person's choice set, rather than the actual choices they have made. If we ask how far they have traveled in the last year, we risk incorrectly specifying the choice set. If the bias is to longer distance of choice set then reality, this is offset by the diminished weight of attributes those options have in the choice set due to the small probability of visiting them (see Parsons 1998).

35. Page 18: Question 3.10: This question asks about the location of saltwater recreation visits. It is not clear whether this question is intended to gather information about any visits respondents may have taken over their lifetime or in the last twelve months. The timeframe should be specified.

**Response:**

We have removed this question from the current version.

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