

Appendix

Contents:

Surveys:

Constant Baseline	A-2
Declining Baseline	A-18
Improving Baseline	A-34
Non-response Follow-Up Survey	A-50

Focus Group and Cognitive Interview Summary	A-54
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The Future of the Chesapeake Bay

Your opinions are needed to inform policy decisions that affect water quality. Please return your completed survey in the postage-paid envelope provided.

Thank you for your help!



The Clean Water Act authorizes collection of this information. All responses will be kept confidential to the extent permitted by law. Response to this survey is voluntary and no action will be taken against you if you choose not to take part. The public reporting burden for this form is estimated to average 18 minutes per response. Send comments regarding the burden estimate or any other aspect of this form to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the survey materials to this address.

The Chesapeake Bay Watershed

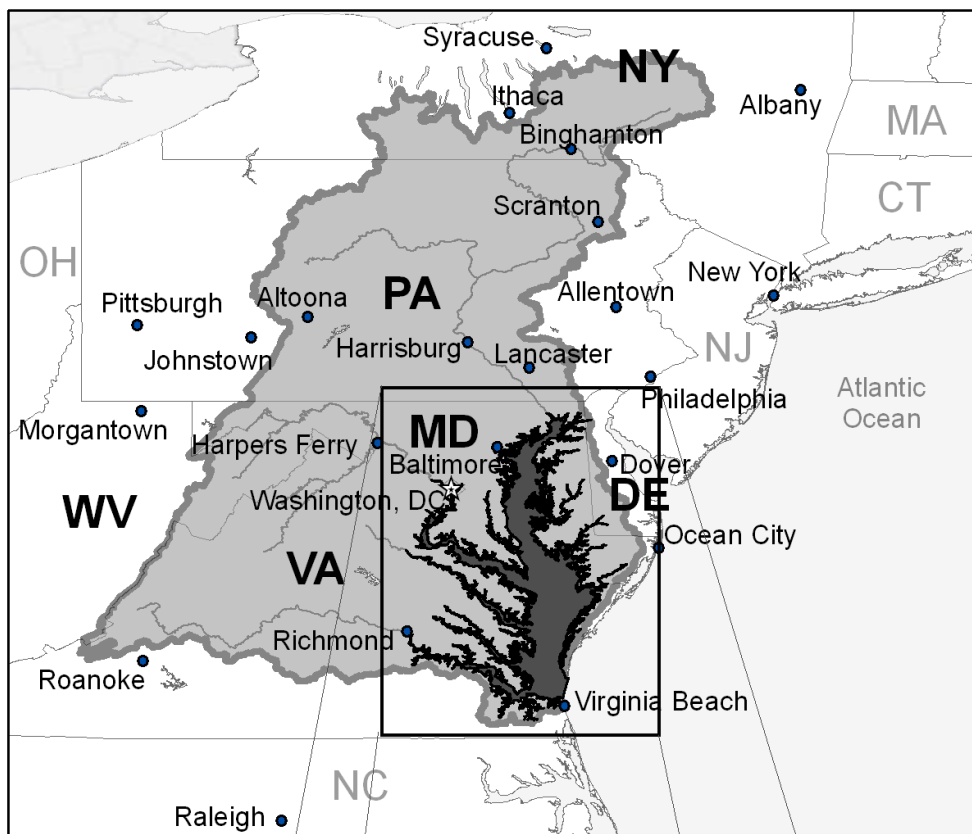
This survey asks you about two types of water bodies in the Chesapeake Bay Watershed — the Chesapeake Bay itself and Lakes in the Watershed. Each has different characteristics and potential water quality concerns.

The Watershed

Is shaded in light grey on this map.

It includes about 4,200 freshwater **lakes**.

Water draining from lands in the Watershed enters rivers and streams and eventually the Chesapeake Bay.



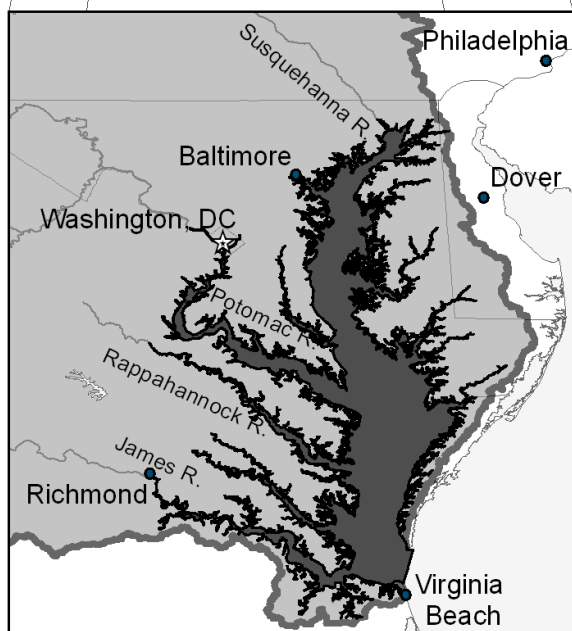
The Chesapeake Bay

Is an estuary where freshwater mixes with saltwater from the ocean. It is the largest estuary in North America and the third largest in the world.

As shown in dark grey on this map, the Bay includes portions of the 50 rivers that flow into it, for example:

- The James River up to Richmond, VA
- The Potomac River up to Washington, DC

Please use this definition of the Chesapeake Bay when answering questions on this survey.



1. Before receiving this survey, had you heard of the Chesapeake Bay?

☐ Yes

☐ No

☐ Don't know

2. On average, how often do you see the following water bodies?

(Please check ONLY ONE box in each row.)

	Never	Less than once a month	More than once a month	Don't Know
Chesapeake Bay:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watershed Lakes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. In the last five years, have you participated in recreational activities
(including swimming, boating, fishing, or viewing nature) at the...**

(Please check ONLY ONE box in each row.)

Chesapeake Bay:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Watershed Lakes:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know

Did you know?

Pollutants in the Chesapeake Bay Watershed degrade the quality of the water and can affect aquatic habitat and recreational activities. Two key pollutants are nutrients and sediment.

- **Nutrients** are essential for healthy aquatic habitats, but too much can lead to algae that deprives fish of oxygen and plants of sunlight. Sources of nutrients include fertilizers, livestock manure, and household wastewater.
- **Sediment** is loose soil that settles to the bottom of water bodies. Too much sediment makes the water murky and harms aquatic plants and fish. Paved surfaces and some farming practices increase soil erosion, causing too much sediment to enter the Chesapeake Bay and Watershed Lakes.

4. Before taking this survey, were you aware that too much nutrients or sediment can degrade water quality?

☐ Yes

☐ No

☐ Don't know

Conditions in the Chesapeake Bay

Nutrient and sediment pollution affects environmental outcomes in the Chesapeake Bay. These conditions have been consistently measured by scientists since the early 1990’s.

Bay Water Clarity— *measures how far one can see into the water*

- Average visibility was about 4.5 to 6 feet in the early 1990’s and is about 3 feet today.

Striped Bass (or Rockfish)— *the most popular fish for recreational fishing in the Bay*

- After historic lows, the population was about 6 million fish in 1990 and is about 24 million today.

Blue Crab— *symbol of the Chesapeake Bay and a popular shellfish for recreational fishing*

- The adult population was between 100 to 200 million in the early 1990’s and has been about 250 million in recent years.

Oysters — *“filter feeders” that clean Bay waters, their shells also form reefs that provide habitat for other aquatic life*

- Historically much larger, the population was only about 3,300 tons by 1990 and remains at this low level today.

State and local governments currently have pollution reduction programs in place to limit nutrients and sediment flowing into the Chesapeake Bay.

These programs will keep future conditions about the same as they are today.

Based on measurements by scientists studying the Chesapeake Bay, this table shows both the **conditions today and predicted conditions in 2025 under current programs.**

	Conditions Today	Conditions in 2025 under current programs*
Bay Water Clarity Average visibility	3 feet	3 feet (no change)
Striped Bass Adult Population	24 million fish	24 million fish (no change)
Blue Crab Adult Population	250 million crabs	250 million crabs (no change)
Oysters Population	3,300 tons	3,300 tons (no change)

**Predictions for the year 2025 are based on monitoring data, the Chesapeake Bay Water Quality Models, and the Chesapeake Bay Fisheries Ecosystem Model developed by the EPA and state and federal partners.*

Conditions in the Watershed Lakes

Nutrient pollution in lakes leads to excess algae growth which changes the appearance of the water and the types of fish that live in it. Watershed Lakes fall into one of these categories:

Watershed Lakes with low algae

- Have clear blue or brown water with 3 to 6 feet of visibility
- Conditions favor game fish like bass and trout

Watershed Lakes with high algae

- Have green water with 2 feet of visibility or less
- Conditions favor bottom-feeding fish like carp and catfish
- Can have an unpleasant odor on warm days

Pollution reduction programs already in place to limit nutrients and sediment flowing into the Chesapeake Bay also help keep algae levels low in Watershed Lakes.

Under pollution reduction programs already in place, the number of lakes with low algae levels is not expected to change.

The table below shows the number of Watershed Lakes that have **low algae levels today and the predicted number in 2025 under current programs.**

	Number Today	Number in 2025 under current programs*
Watershed Lakes with <u>low</u> algae levels	2,900 lakes <i>out of 4,200 total</i>	2,900 lakes <i>out of 4,200 total</i> (no change)

**Predictions for the year 2025 are based on measures developed by the EPA using the SPARROW Water Quality Model.*

5. If you were taking a recreational trip to a lake, which would you prefer?

- ☐ I would prefer to visit a lake with low algae levels and clearer water.
- ☐ I would prefer to visit a lake with high algae levels and greener water.
- ☐ I don't have a preference, either type of lake would be fine.
- ☐ I don't know

Additional Pollution Reduction Programs for the Chesapeake Bay Watershed

Additional pollution programs being considered by federal and state agencies would further limit nutrients and sediment in the Chesapeake Bay Watershed.

These programs would be phased in over time and would be fully implemented by the year 2025. Environmental conditions would begin to improve shortly after the new programs are implemented and reach long term levels by 2025. There is always some uncertainty in predicting future environmental conditions, but the outcomes shown in this survey are based on the best scientific predictions available.

Examples of programs include changing the way farmers dispose of livestock manure and farm land to reduce runoff, paving fewer surfaces to slow stormwater runoff, and changing equipment at wastewater treatment facilities to reduce spills and pollution releases.

What additional programs *would do*:

- Improve some of the conditions in the Chesapeake Bay and Watershed Lakes. The specific types of improvements will depend on the design of the program.

For example:

- A pollution reduction program close to the Bay would improve water quality in the Chesapeake Bay itself, but would *not* have much affect on the Watershed Lakes.
- A program restoring oyster reefs would increase the number of oysters, but would have a smaller effect on crab populations compared to programs focused on reducing nutrients and sediment.

What additional programs *would not do*:

- Affect lakes outside of the Watershed
- Affect river and stream conditions in a noticeable way because the water is constantly moving
- Affect any other parts of the environment such as forests, plants, birds, and wildlife
- Have a noticeable effect on the quality or price of the seafood you buy

Paying for Additional Pollution Reduction Programs

Additional pollution reduction programs would result in higher costs for your household.

Some of the basic things people spend money on would become more expensive.

For example:

- Higher water bills or increased maintenance costs for home septic systems in the Watershed. For renters, rent or utility bills would increase.
- Higher prices for some agricultural products and other goods for households both inside and outside the Watershed, including the area where you live. This is because of higher costs for businesses inside the Watershed.

Any additional pollution reduction program, if implemented, would permanently increase the cost of living for *your* household beginning at the start of next year.

Paying the costs means you would have less money to spend on other things such as food, clothes, going on trips, education, and even towards resolving other environmental problems you care about.

6. Does your household currently pay any environmentally-related taxes or fees as part of your water, electric or other utility bills?

☐ Yes

☐ No

☐ Don't know

Deciding Future Actions

Imagine that you were given the opportunity to vote on additional pollution reduction programs. State and federal policy makers will use your votes and those from others to choose the best program to improve water quality.

Important instructions

In the questions that follow, we ask your opinion about programs that have different impacts on the Chesapeake Bay and Watershed Lakes. These programs will cost your household different amounts.

You will be asked three questions. In each question you will vote for the option you like best from three different alternatives:

- OPTION A keeps all current actions but does not add new programs
- OPTION B and OPTION C include additional programs to reduce pollution

Choosing OPTION A in each question would result in no new pollution reductions or costs to your household.

OPTION B and OPTION C are different in each question, with different environmental outcomes and costs to your household.

An Example Question is on the next page to show you what the questions will look like.

Other households are also being surveyed, so please only think of the costs to your own household when deciding which program you would prefer.

Similar studies have shown that people sometimes respond differently in a survey than they would in real life, often saying they would pay more than they really would. **When voting we urge you to respond as though costs to your household would really go up if the program were implemented.**

An Example Question

In each question, you will be asked to vote on three options. (Mark one box at the bottom of each question to indicate which option you prefer.)

Environmental Outcomes

from each option are listed here. The percent changes compared to today are also shown in parentheses.

Annual Cost to your household

is listed here. Notice that higher costs do not necessarily mean that all environmental outcomes will improve more.

Conditions in 2025			
(% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3 feet (no change)	3.5 feet (17% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	24 million fish (no change)	36 million fish (50% increase)	36 million fish (50% increase)
Blue Crab Adult Population	250 million crabs (no change)	250 million crabs (no change)	285 million crabs (14% increase)
Oysters Population	3,300 tons (no change)	10,000 tons (203% increase)	3,300 tons (no change)
Watershed Lakes Lakes with low algae levels	2,900 lakes (no change)	3,300 lakes (14% increase)	3,300 lakes (14% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$40 every year or \$3.33 every month	\$180 every year or \$15 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <input checked="" type="checkbox"/>	Option B <input checked="" type="checkbox"/>	Option C <input checked="" type="checkbox"/>

To vote for Option A
mark this box

To vote for Option B
mark this box

To vote for Option C
mark this box

When you vote on the next questions, please remember...

- There will be three sets of voting questions. Consider each question separately. Imagine that the options in that question are the only ones available to choose from.
- Options in different questions should not be compared to each other.
- Do not add up effects or costs across different questions.
- The environmental outcomes in each question are based on the best scientific predictions available. Please vote as if these outcomes would actually occur in the year 2025.

7. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

	Conditions in 2025 (% change compared to today)		
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3 feet (no change)	3 feet (no change)	3.5 feet (17% increase)
Striped Bass Adult Population	24 million fish (no change)	30 million fish (25% increase)	24 million fish (no change)
Blue Crab Adult Population	250 million crabs (no change)	250 million crabs (no change)	250 million crabs (no change)
Oysters Population	3,300 tons (no change)	5,500 tons (67% increase)	3,300 tons (no change)
Watershed Lakes Lakes with <u>low</u> algae levels	2,900 lakes (no change)	3,300 lakes (14% increase)	3,300 lakes (14% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$500 every year or \$41.67 every month	\$250 every year or \$20.83 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

8. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3 feet (no change)	3.5 feet (17% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	24 million fish (no change)	24 million fish (no change)	24 million fish (no change)
Blue Crab Adult Population	250 million crabs (no change)	285 million crabs (14% increase)	285 million crabs (14% increase)
Oysters Population	3,300 tons (no change)	10,000 tons (203% increase)	10,000 tons (203% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	2,900 lakes (no change)	3,850 lakes (33% increase)	2,900 lakes (no change)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$60 every year or \$5.00 every month	\$20 every year or \$1.67 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

9. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3 feet (no change)	4.5 feet (50% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	24 million fish (no change)	36 million fish (50% increase)	36 million fish (50% increase)
Blue Crab Adult Population	250 million crabs (no change)	328 million crabs (31% increase)	285 million crabs (14% increase)
Oysters Population	3,300 tons (no change)	3,300 tons (no change)	5,500 tons (67% increase)
Watershed Lakes Lakes with low algae levels	2,900 lakes (no change)	3,300 lakes (14% increase)	3,300 lakes (14% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$40 every year or \$3.33 every month	\$20 every year or \$1.67 every month
Your Vote Please mark one of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

Thinking about how you just voted...

10. Please rate how much you agree or disagree with the following statements.
(Please circle one number for each statement.)

	Strongly Disagree			Strongly Agree		Don't Know
I voted as if my household would actually face the costs shown in the questions.	1	2	3	4	5	DK
I voted as if the programs would actually achieve the results shown by 2025.	1	2	3	4	5	DK
If new programs were implemented, I would expect to see some environmental improvements before 2025.	1	2	3	4	5	DK
I would vote differently if the programs took longer to achieve the results shown.	1	2	3	4	5	DK
It is important to improve waters in the Chesapeake Bay Watershed, no matter how high the costs.	1	2	3	4	5	DK
I am against any more regulations and government spending.	1	2	3	4	5	DK
My household should not have to pay any amount to improve Bay Waters and Watershed Lakes.	1	2	3	4	5	DK
It is difficult for me to find time to take surveys.	1	2	3	4	5	DK

11. How much do you agree or disagree that the following affected your vote?
(Please circle one number for each statement.)

	Strongly Disagree			Strongly Agree		Don't Know
Changes in the quality or price of seafood	1	2	3	4	5	DK
Impacts on the economy and jobs	1	2	3	4	5	DK
Improving the environment for others	1	2	3	4	5	DK
Water quality improvements to lakes <i>outside</i> the Chesapeake Bay Watershed	1	2	3	4	5	DK
Preserving the environment for future generations	1	2	3	4	5	DK
Trips I may take to the Chesapeake Bay or Watershed Lakes in the future	1	2	3	4	5	DK

12. In the last 12 months, how many times did you visit an outdoor recreation site on the Chesapeake Bay? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
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13. If you did visit one or more sites on the Chesapeake Bay in the last 12 months, which site did you visit most often? *(Fill in as much information as you can)*

13a. Name of site _____

13b. How long did it take you to drive there from your home?

_____ hours and _____ minutes

13c. What state is it in? _____

13d. What is the nearest town? _____

13e. What did you do on your visit(s) to that site? *(Check all the activities you did on your visits)*

☐ Fishing and/or crabbing

☐ Swimming

☐ Boating, canoeing or kayaking

☐ Camping

☐ Hunting

☐ Hiking

☐ Bird watching or wildlife viewing

☐ Other _____

14. In the last 12 months, how many times did you visit a lake, stream, or river in the Chesapeake Bay Watershed? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
---	---	---	---	---	---	---

15. Many people are looking for ways to reduce their utility bills. If you were offered a device that cost \$200 and would reduce your household electricity bill by \$2 each month for the next 10 years, would you purchase the device?

☐ Yes

☐ No

☐ Don't know

Questions about you and your household

Finally, we would like to ask a few questions about you and your household. Your answers will not be saved or stored in a way that can be associated with your name or address. You will not be contacted about your responses or this survey.

- 16. What is your sex?** ☐ Male ☐ Female
- 17. What is your age?** _____ years old
- 18. How many children under age 18 are living in your home?** _____ children

19. Have you or any member of your family ever worked in any of the following industries or jobs?

- ☐ Agriculture ☐ Tour guide for fishing
- ☐ Commercial fishing ☐ Environmental non-profit group
- ☐ No one in my family ever worked in these industries

20. In 2012, what was your total pre-tax household income, including all earners in your household?

- ☐ Under \$25,000 ☐ \$100,000-\$149,999
- ☐ \$25,000-\$49,999 ☐ \$150,000-\$199,999
- ☐ \$50,000-\$74,999 ☐ \$200,000 or more
- ☐ \$75,000-\$99,999

21. Are you of Hispanic, Latino, or Spanish origin? ☐ Yes ☐ No

22. What is your race? *(Select one or more.)*

- ☐ American Indian or Alaska Native ☐ Asian
- ☐ Black or African American ☐ White
- ☐ Native Hawaiian or Other Pacific Islander

23. What is the highest degree or level of school you have completed?

- ☐ Elementary or high school, but no high school diploma or GED
- ☐ High school diploma, GED, or other high school completion
- ☐ Some college credit, no degree
- ☐ Associate's Degree (for example: AA, AS)
- ☐ Bachelor's Degree (for example: BA, BS)
- ☐ Master's degree, professional degree, or doctorate degree
(for example: MA, MSW, MD, DDS, JD, PhD, EdD)

Thank you very much for your help.

Please mail this completed survey back to us in the postage-paid return envelope provided.



Thanks again for completing this survey!

If you have any additional thoughts about any of the topics covered or the survey itself, please share them here.



**If you have any questions please call 617-520-2476
or email chesapeake_survey@abtassoc.com.**

The Future of the Chesapeake Bay

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The Chesapeake Bay Watershed

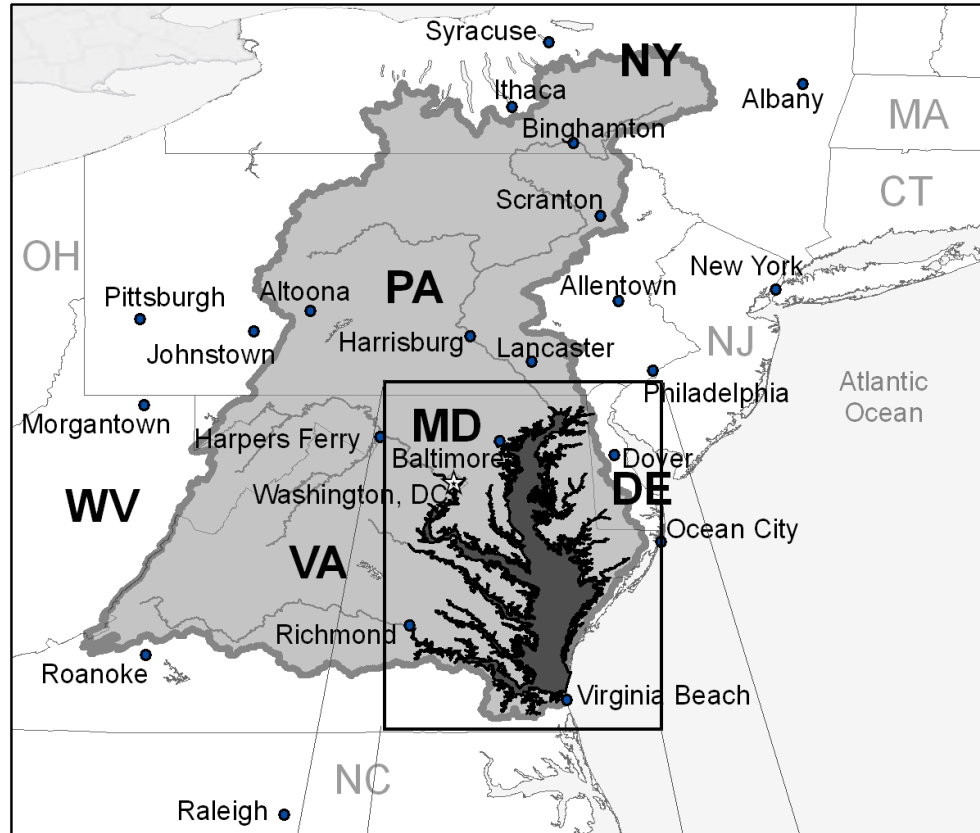
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The Watershed

Is shaded in light grey on this map.

It includes about 4,200 freshwater **lakes**.

Water draining from lands in the Watershed enters rivers and streams and eventually the Chesapeake Bay.



The Chesapeake Bay

Is an estuary where freshwater mixes with saltwater from the ocean. It is the largest estuary in North America and the third largest in the world.

As shown in dark grey on this map, the Bay includes portions of the 50 rivers that flow into it, for example:

- The James River up to Richmond, VA
- The Potomac River up to Washington, DC

Please use this definition of the Chesapeake Bay when answering questions on this survey.



1. Before receiving this survey, had you heard of the Chesapeake Bay?

☐ Yes

☐ No

☐ Don't know

2. On average, how often do you see the following water bodies?

(Please check ONLY ONE box in each row.)

	Never	Less than once a month	More than once a month	Don't Know
Chesapeake Bay:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watershed Lakes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. In the last five years, have you participated in recreational activities
(including swimming, boating, fishing, or viewing nature) at the...**

(Please check ONLY ONE box in each row.)

Chesapeake Bay:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Watershed Lakes:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know

Did you know?

Pollutants in the Chesapeake Bay Watershed degrade the quality of the water and can affect aquatic habitat and recreational activities. Two key pollutants are nutrients and sediment.

- **Nutrients** are essential for healthy aquatic habitats, but too much can lead to algae that deprives fish of oxygen and plants of sunlight. Sources of nutrients include fertilizers, livestock manure, and household wastewater.
- **Sediment** is loose soil that settles to the bottom of water bodies. Too much sediment makes the water murky and harms aquatic plants and fish. Paved surfaces and some farming practices increase soil erosion, causing too much sediment to enter the Chesapeake Bay and Watershed Lakes.

4. Before taking this survey, were you aware that too much nutrients or sediment can degrade water quality?

☐ Yes

☐ No

☐ Don't know

Conditions in the Chesapeake Bay

Nutrient and sediment pollution affects environmental outcomes in the Chesapeake Bay. These conditions have been consistently measured by scientists since the early 1990's.

Bay Water Clarity— *measures how far one can see into the water*

- Average visibility was about 4.5 to 6 feet in the early 1990's and is about 3 feet today.

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Blue Crab— *symbol of the Chesapeake Bay and a popular shellfish for recreational fishing*

- The adult population was between 100 to 200 million in the early 1990's and has been about 250 million in recent years.

Oysters — *"filter feeders" that clean Bay waters, their shells also form reefs that provide habitat for other aquatic life*

- Historically much larger, the population was only about 3,300 tons by 1990 and remains at this low level today.

State and local governments currently have pollution reduction programs in place to limit nutrients and sediment flowing into the Chesapeake Bay.

But population growth and changes in how land is used within the watershed are expected to cause conditions in the Bay to decline in the future.

Based on measurements by scientists studying the Chesapeake Bay, this table shows both the **conditions today and predicted conditions in 2025 under current programs.**

	Conditions Today	Conditions in 2025 under current programs*
Bay Water Clarity Average visibility	3 feet	2 feet (33% decrease from today)
Striped Bass Adult Population	24 million fish	21 million fish (13% decrease from today)
Blue Crab Adult Population	250 million crabs	225 million crabs (10% decrease from today)
Oysters Population	3,300 tons	2,800 tons (15% decrease from today)

**Predictions for the year 2025 are based on monitoring data, the Chesapeake Bay Water Quality Models, and the Chesapeake Bay Fisheries Ecosystem Model developed by the EPA and state and federal partners.*

Conditions in the Watershed Lakes

Nutrient pollution in lakes leads to excess algae growth which changes the appearance of the water and the types of fish that live in it. Watershed Lakes fall into one of these categories:

Watershed Lakes with low algae

- Have clear blue or brown water with 3 to 6 feet of visibility
- Conditions favor game fish like bass and trout

Watershed Lakes with high algae

- Have green water with 2 feet of visibility or less
- Conditions favor bottom-feeding fish like carp and catfish
- Can have an unpleasant odor on warm days

Pollution reduction programs already in place to limit nutrients and sediment flowing into the Chesapeake Bay also help keep algae levels low in Watershed Lakes.

But population growth and changes in how land is used within the watershed are expected to result in fewer Watershed Lakes with low algae levels.

The table below shows the number of Watershed Lakes that have **low algae levels today** and the predicted number in **2025 under current programs**.

	Number Today	Number in 2025 under current programs*
Watershed Lakes with <u>low</u> algae levels	2,900 lakes <i>out of 4,200 total</i>	2,300 lakes <i>out of 4,200 total</i> (21% decrease from today)

**Predictions for the year 2025 are based on measures developed by the EPA using the SPARROW Water Quality Model.*

5. If you were taking a recreational trip to a lake, which would you prefer?

- ☐ I would prefer to visit a lake with low algae levels and clearer water.
- ☐ I would prefer to visit a lake with high algae levels and greener water.
- ☐ I don't have a preference, either type of lake would be fine.
- ☐ I don't know

Additional Pollution Reduction Programs for the Chesapeake Bay Watershed

Additional pollution programs being considered by federal and state agencies would further limit nutrients and sediment in the Chesapeake Bay Watershed.

These programs would be phased in over time and would be fully implemented by the year 2025. Environmental conditions would begin to improve shortly after the new programs are implemented and reach long term levels by 2025. There is always some uncertainty in predicting future environmental conditions, but the outcomes shown in this survey are based on the best scientific predictions available.

Examples of programs include changing the way farmers dispose of livestock manure and farm land to reduce runoff, paving fewer surfaces to slow stormwater runoff, and changing equipment at wastewater treatment facilities to reduce spills and pollution releases.

What additional programs *would do*:

- Improve some of the conditions in the Chesapeake Bay and Watershed Lakes. The specific types of improvements will depend on the design of the program.

For example:

- A pollution reduction program close to the Bay would improve water quality in the Chesapeake Bay itself, but would *not* have much affect on the Watershed Lakes.
- A program restoring oyster reefs would increase the number of oysters, but would have a smaller effect on crab populations compared to programs focused on reducing nutrients and sediment.

What additional programs *would not do*:

- Affect lakes outside of the Watershed
- Affect river and stream conditions in a noticeable way because the water is constantly moving
- Affect any other parts of the environment such as forests, plants, birds, and wildlife
- Have a noticeable effect on the quality or price of the seafood you buy

Paying for Additional Pollution Reduction Programs

Additional pollution reduction programs would result in higher costs for your household.

Some of the basic things people spend money on would become more expensive.

For example:

- Higher water bills or increased maintenance costs for home septic systems in the Watershed. For renters, rent or utility bills would increase.
- Higher prices for some agricultural products and other goods for households both inside and outside the Watershed, including the area where you live. This is because of higher costs for businesses inside the Watershed.

Any additional pollution reduction program, if implemented, would permanently increase the cost of living for *your* household beginning at the start of next year.

Paying the costs means you would have less money to spend on other things such as food, clothes, going on trips, education, and even towards resolving other environmental problems you care about.

6. Does your household currently pay any environmentally-related taxes or fees as part of your water, electric or other utility bills?

☐ Yes

☐ No

☐ Don't know

Deciding Future Actions

Imagine that you were given the opportunity to vote on additional pollution reduction programs. State and federal policy makers will use your votes and those from others to choose the best program to improve water quality.

Important instructions

In the questions that follow, we ask your opinion about programs that have different impacts on the Chesapeake Bay and Watershed Lakes. These programs will cost your household different amounts.

You will be asked three questions. In each question you will vote for the option you like best from three different alternatives:

- OPTION A keeps all current actions but does not add new programs
- OPTION B and OPTION C include additional programs to reduce pollution

Choosing OPTION A in each question would result in no new pollution reductions or costs to your household.

OPTION B and OPTION C are different in each question, with different environmental outcomes and costs to your household.

An Example Question is on the next page to show you what the questions will look like.

Other households are also being surveyed, so please only think of the costs to your own household when deciding which program you would prefer.

Similar studies have shown that people sometimes respond differently in a survey than they would in real life, often saying they would pay more than they really would. **When voting we urge you to respond as though costs to your household would really go up if the program were implemented.**

An Example Question

In each question, you will be asked to vote on three options. (Mark one box at the bottom of each question to indicate which option you prefer.)

Environmental Outcomes
from each option are listed here. The percent changes compared to today are also shown in parentheses.

Annual Cost to your household is listed here. Notice that higher costs do not necessarily mean that all environmental outcomes will improve more.

Conditions in 2025			
(% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	2 feet (33% decrease)	3 feet (no change)	3 feet (no change)
Striped Bass Adult Population	21 million fish (13% decrease)	24 million fish (no change)	24 million fish (no change)
Blue Crab Adult Population	225 million crabs (10% decrease)	328 million crabs (31% increase)	250 million crabs (no change)
Oysters Population	2,800 tons (15% decrease)	5,500 tons (67% increase)	10,000 tons (203% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	2,300 lakes (21% decrease)	3,300 lakes (14% increase)	3,850 lakes (33% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$60 every year or \$5 every month	\$180 every year or \$15 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <input checked="" type="checkbox"/>	Option B <input checked="" type="checkbox"/>	Option C <input checked="" type="checkbox"/>

To vote for **Option A**
mark this box

To vote for **Option B**
mark this box

To vote for **Option C**
mark this box

When you vote on the next questions, please remember...

- There will be three sets of voting questions. Consider each question separately. Imagine that the options in that question are the only ones available to choose from.
- Options in different questions should not be compared to each other.
- Do not add up effects or costs across different questions.
- The environmental outcomes in each question are based on the best scientific predictions available. Please vote as if these outcomes would actually occur in the year 2025.

7. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

	Conditions in 2025 (% change compared to today)		
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	2 feet (33% decrease)	3 feet (no change)	3.5 feet (17% increase)
Striped Bass Adult Population	21 million fish (13% decrease)	30 million fish (25% increase)	24 million fish (no change)
Blue Crab Adult Population	225 million crabs (10% decrease)	250 million crabs (no change)	250 million crabs (no change)
Oysters Population	2,800 tons (15% decrease)	5,500 tons (67% increase)	3,300 tons (0% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	2,300 lakes (21% decrease)	3,300 lakes (14% increase)	3,300 lakes (14% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$500 every year or \$41.67 every month	\$250 every year or \$20.83 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

8. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	2 feet (33% decrease)	3.5 feet (17% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	21 million fish (13% decrease)	24 million fish (no change)	24 million fish (no change)
Blue Crab Adult Population	225 million crabs (10% decrease)	285 million crabs (14% increase)	285 million crabs (14% increase)
Oysters Population	2,800 tons (15% decrease)	10,000 tons (203% increase)	10,000 tons (203% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	2,300 lakes (21% decrease)	3,850 lakes (33% increase)	2,900 lakes (0% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$60 every year or \$5 every month	\$20 every year or \$1.67 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

9. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	2 feet (33% decrease)	4.5 feet (50% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	21 million fish (13% decrease)	36 million fish (50% increase)	36 million fish (50% increase)
Blue Crab Adult Population	225 million crabs (10% decrease)	328 million crabs (31% increase)	285 million crabs (14% increase)
Oysters Population	2,800 tons (15% decrease)	3,300 tons (0% increase)	5,500 tons (67% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	2,300 lakes (21% decrease)	3,300 lakes (14% increase)	3,300 lakes (14% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$40 every year or \$3.33 every month	\$20 every year or \$1.67 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <input type="checkbox"/>	Option B <input type="checkbox"/>	Option C <input type="checkbox"/>

Thinking about how you just voted...

10. Please rate how much you agree or disagree with the following statements.

	Strongly Disagree			Strongly Agree		Don't Know
I voted as if my household would actually face the costs shown in the questions.	1	2	3	4	5	DK
I voted as if the programs would actually achieve the results shown by 2025.	1	2	3	4	5	DK
If new programs were implemented, I would expect to see some environmental improvements before 2025.	1	2	3	4	5	DK
I would vote differently if the programs took longer to achieve the results shown.	1	2	3	4	5	DK
It is important to improve waters in the Chesapeake Bay Watershed, no matter how high the costs.	1	2	3	4	5	DK
I am against any more regulations and government spending.	1	2	3	4	5	DK
My household should not have to pay any amount to improve Bay Waters and Watershed Lakes.	1	2	3	4	5	DK
It is difficult for me to find time to take surveys.	1	2	3	4	5	DK

11. How much do you agree or disagree that the following *affected your vote*?

(Please circle one number for each statement.)

	Strongly Disagree			Strongly Agree		Don't Know
Changes in the quality or price of seafood	1	2	3	4	5	DK
Impacts on the economy and jobs	1	2	3	4	5	DK
Improving the environment for others	1	2	3	4	5	DK
Water quality improvements to lakes <i>outside</i> the Chesapeake Bay Watershed	1	2	3	4	5	DK
Preserving the environment for future generations	1	2	3	4	5	DK
Trips I may take to the Chesapeake Bay or Watershed Lakes in the future	1	2	3	4	5	DK

12. In the last 12 months, how many times did you visit an outdoor recreation site on the Chesapeake Bay? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
---	---	---	---	---	---	---

13. If you did visit one or more sites on the Chesapeake Bay in the last 12 months, which site did you visit most often? *(Fill in as much information as you can)*

13a. Name of site _____

13b. How long did it take you to drive there from your home?

_____ hours and _____ minutes

13c. What state is it in? _____

13d. What is the nearest town? _____

13e. What did you do on your visit(s) to that site? *(Check all the activities you did on your visits)*

☐ Fishing and/or crabbing

☐ Swimming

☐ Boating, canoeing or kayaking

☐ Camping

☐ Hunting

☐ Hiking

☐ Bird watching or wildlife viewing

☐ Other _____

14. In the last 12 months, how many times did you visit a lake, stream, or river in the Chesapeake Bay Watershed? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
---	---	---	---	---	---	---

15. Many people are looking for ways to reduce their utility bills. If you were offered a device that cost \$50 and would reduce your household electricity bill by \$2 each month for the next 10 years, would you purchase the device?

☐ Yes

☐ No

☐ Don't know

Questions about you and your household

Finally, we would like to ask a few questions about you and your household. Your answers will not be saved or stored in a way that can be associated with your name or address. You will not be contacted about your responses or this survey.

- 16. What is your sex?** ☐ Male ☐ Female
- 17. What is your age?** _____ years old
- 18. How many children under age 18 are living in your home?** _____ children

19. Have you or any member of your family ever worked in any of the following industries or jobs?

- ☐ Agriculture ☐ Tour guide for fishing
- ☐ Commercial fishing ☐ Environmental non-profit group
- ☐ No one in my family ever worked in these industries

20. In 2012, what was your total pre-tax household income, including all earners in your household?

- ☐ Under \$25,000 ☐ \$100,000-\$149,999
- ☐ \$25,000-\$49,999 ☐ \$150,000-\$199,999
- ☐ \$50,000-\$74,999 ☐ \$200,000 or more
- ☐ \$75,000-\$99,999

21. Are you of Hispanic, Latino, or Spanish origin? ☐ Yes ☐ No

22. What is your race? *(Select one or more.)*

- ☐ American Indian or Alaska Native ☐ Asian
- ☐ Black or African American ☐ White
- ☐ Native Hawaiian or Other Pacific Islander

23. What is the highest degree or level of school you have completed?

- ☐ Elementary or high school, but no high school diploma or GED
- ☐ High school diploma, GED, or other high school completion
- ☐ Some college credit, no degree
- ☐ Associate's Degree (for example: AA, AS)
- ☐ Bachelor's Degree (for example: BA, BS)
- ☐ Master's degree, professional degree, or doctorate degree
(for example: MA, MSW, MD, DDS, JD, PhD, EdD)

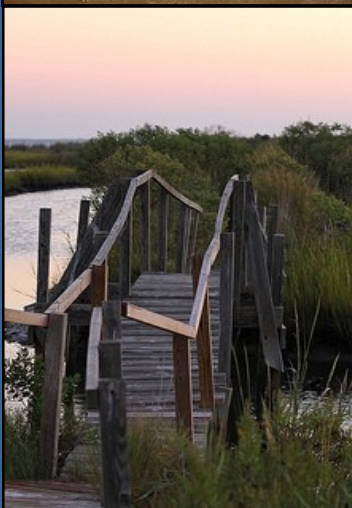
Thank you very much for your help.

Please mail this completed survey back to us in the postage-paid return envelope provided.



Thanks again for completing this survey!

If you have any additional thoughts about any of the topics covered or the survey itself, please share them here.



**If you have any questions please call 617-520-2476
or email chesapeake_survey@abtassoc.com.**

The Future of the Chesapeake Bay

Your opinions are needed to inform policy decisions that affect water quality. Please return your completed survey in the postage-paid envelope provided.

Thank you for your help!



The Clean Water Act authorizes collection of this information. All responses will be kept confidential to the extent permitted by law. Response to this survey is voluntary and no action will be taken against you if you choose not to take part. The public reporting burden for this form is estimated to average 18 minutes per response. Send comments regarding the burden estimate or any other aspect of this form to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the survey materials to this address.

The Chesapeake Bay Watershed

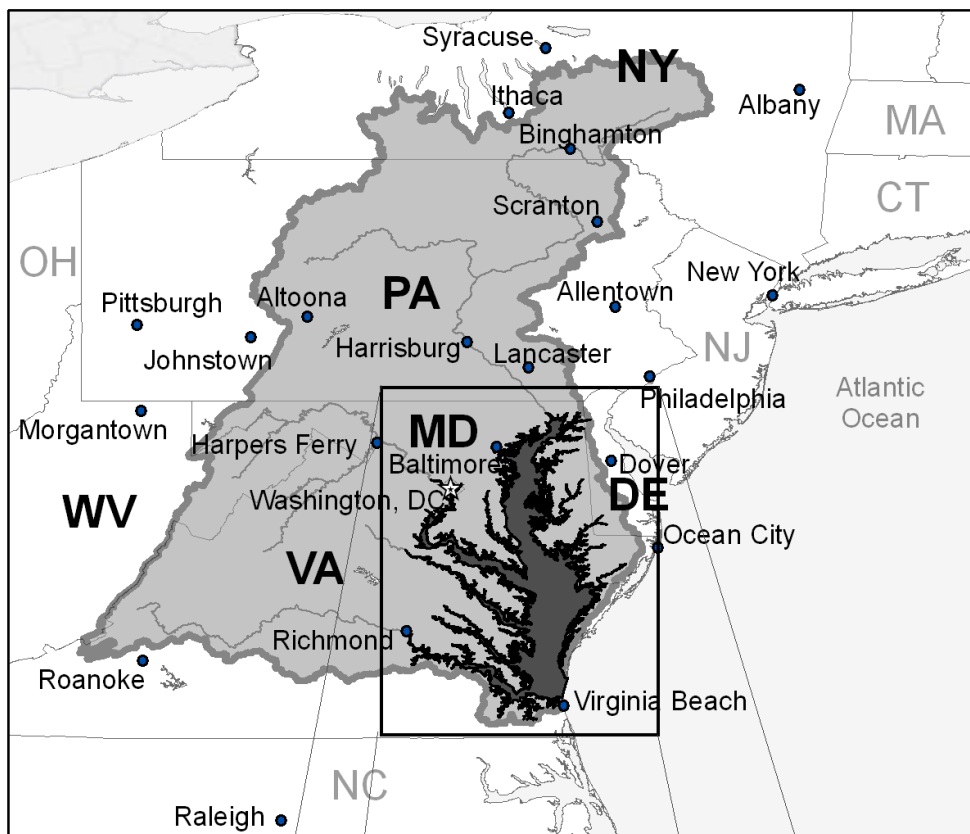
This survey asks you about two types of water bodies in the Chesapeake Bay Watershed — the Chesapeake Bay itself and Lakes in the Watershed. Each has different characteristics and potential water quality concerns.

The Watershed

Is shaded in light grey on this map.

It includes about 4,200 freshwater **lakes**.

Water draining from lands in the Watershed enters rivers and streams and eventually the Chesapeake Bay.



The Chesapeake Bay

Is an estuary where freshwater mixes with saltwater from the ocean. It is the largest estuary in North America and the third largest in the world.

As shown in dark grey on this map, the Bay includes portions of the 50 rivers that flow into it, for example:

- The James River up to Richmond, VA
- The Potomac River up to Washington, DC

Please use this definition of the Chesapeake Bay when answering questions on this survey.



1. Before receiving this survey, had you heard of the Chesapeake Bay?

☐ Yes

☐ No

☐ Don't know

2. On average, how often do you see the following water bodies?

(Please check ONLY ONE box in each row.)

	Never	Less than once a month	More than once a month	Don't Know
Chesapeake Bay:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watershed Lakes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. In the last five years, have you participated in recreational activities
(including swimming, boating, fishing, or viewing nature) at the...**

(Please check ONLY ONE box in each row.)

Chesapeake Bay:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Watershed Lakes:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know

Did you know?

Pollutants in the Chesapeake Bay Watershed degrade the quality of the water and can affect aquatic habitat and recreational activities. Two key pollutants are nutrients and sediment.

- **Nutrients** are essential for healthy aquatic habitats, but too much can lead to algae that deprives fish of oxygen and plants of sunlight. Sources of nutrients include fertilizers, livestock manure, and household wastewater.
- **Sediment** is loose soil that settles to the bottom of water bodies. Too much sediment makes the water murky and harms aquatic plants and fish. Paved surfaces and some farming practices increase soil erosion, causing too much sediment to enter the Chesapeake Bay and Watershed Lakes.

4. Before taking this survey, were you aware that too much nutrients or sediment can degrade water quality?

☐ Yes

☐ No

☐ Don't know

Conditions in the Chesapeake Bay

Nutrient and sediment pollution affects environmental outcomes in the Chesapeake Bay. These conditions have been consistently measured by scientists since the early 1990's.

Bay Water Clarity— *measures how far one can see into the water*

- Average visibility was about 4.5 to 6 feet in the early 1990's and is about 3 feet today.

Striped Bass (or Rockfish)— *the most popular fish for recreational fishing in the Bay*

- After historic lows, the population was about 6 million fish in 1990 and is about 24 million today.

Blue Crab— *symbol of the Chesapeake Bay and a popular shellfish for recreational fishing*

- The adult population was between 100 to 200 million in the early 1990's and has been about 250 million in recent years.

Oysters — *"filter feeders" that clean Bay waters, their shells also form reefs that provide habitat for other aquatic life*

- Historically much larger, the population was only about 3,300 tons by 1990 and remains at this low level today.

State and local governments currently have pollution reduction programs in place to limit nutrients and sediment flowing into the Chesapeake Bay.

These programs are expected to improve future conditions.

Based on measurements by scientists studying the Chesapeake Bay, this table shows both the **conditions today and predicted conditions in 2025 under current programs.**

	Conditions Today	Conditions in 2025 under current programs*
Bay Water Clarity Average visibility	3 feet	3.3 feet (10% increase from today)
Striped Bass Adult Population	24 million fish	26 million fish (8% increase from today)
Blue Crab Adult Population	250 million crabs	260 million crabs (4% increase from today)
Oysters Population	3,300 tons	4,300 tons (30% increase from today)

**Predictions for the year 2025 are based on monitoring data, the Chesapeake Bay Water Quality Models, and the Chesapeake Bay Fisheries Ecosystem Model developed by the EPA and state and federal partners.*

Conditions in the Watershed Lakes

Nutrient pollution in lakes leads to excess algae growth which changes the appearance of the water and the types of fish that live in it. Watershed Lakes fall into one of these categories:

Watershed Lakes with low algae

- Have clear blue or brown water with 3 to 6 feet of visibility
- Conditions favor game fish like bass and trout

Watershed Lakes with high algae

- Have green water with 2 feet of visibility or less
- Conditions favor bottom-feeding fish like carp and catfish
- Can have an unpleasant odor on warm days

Pollution reduction programs already in place to limit nutrients and sediment flowing into the Chesapeake Bay also help keep algae levels low in Watershed Lakes.

Under pollution reduction programs already in place, the number of lakes with low algae levels is expected to increase.

The table below shows the number of Watershed Lakes that have **low algae levels today** and the predicted number in 2025 under current programs.

	Number Today	Number in 2025 under current programs*
Watershed Lakes with <u>low</u> algae levels	2,900 lakes out of 4,200 total	3,100 lakes out of 4,200 total (7% increase from today)

**Predictions for the year 2025 are based on measures developed by the EPA using the SPARROW Water Quality Model.*

5. If you were taking a recreational trip to a lake, which would your prefer?

☐ I would prefer to visit a lake with low algae levels and clearer water

☐ I would prefer to visit a lake with high algae levels and greener water

☐ I don't have a preference, either type of lake would be fine

☐ I don't know

Additional Pollution Reduction Programs for the Chesapeake Bay Watershed

Additional pollution programs being considered by federal and state agencies would further limit nutrients and sediment in the Chesapeake Bay Watershed.

These programs would be phased in over time and would be fully implemented by the year 2025. Environmental conditions would begin to improve shortly after the new programs are implemented and reach long term levels by 2025. There is always some uncertainty in predicting future environmental conditions, but the outcomes shown in this survey are based on the best scientific predictions available.

Examples of programs include changing the way farmers dispose of livestock manure and farm land to reduce runoff, paving fewer surfaces to slow stormwater runoff, and changing equipment at wastewater treatment facilities to reduce spills and pollution releases.

What additional programs *would do*:

- Improve some of the conditions in the Chesapeake Bay and Watershed Lakes. The specific types of improvements will depend on the design of the program.

For example:

- A pollution reduction program close to the Bay would improve water quality in the Chesapeake Bay itself, but would *not* have much affect on the Watershed Lakes.
- A program restoring oyster reefs would increase the number of oysters, but would have a smaller effect on crab populations compared to programs focused on reducing nutrients and sediment.

What additional programs *would not do*:

- Affect lakes outside of the Watershed
- Affect river and stream conditions in a noticeable way because the water is constantly moving
- Affect any other parts of the environment such as forests, plants, birds, and wildlife
- Have a noticeable effect on the quality or price of the seafood you buy

Paying for Additional Pollution Reduction Programs

Additional pollution reduction programs would result in higher costs for your household.

Some of the basic things people spend money on would become more expensive.

For example:

- Higher water bills or increased maintenance costs for home septic systems in the Watershed. For renters, rent or utility bills would increase.
- Higher prices for some agricultural products and other goods for households both inside and outside the Watershed, including the area where you live. This is because of higher costs for businesses inside the Watershed.

Any additional pollution reduction program, if implemented, would permanently increase the cost of living for *your* household beginning at the start of next year.

Paying the costs means you would have less money to spend on other things such as food, clothes, going on trips, education, and even towards resolving other environmental problems you care about.

6. Does your household currently pay any environmentally-related taxes or fees as part of your water, electric or other utility bills?

☐ Yes

☐ No

☐ Don't know

Deciding Future Actions

Imagine that you were given the opportunity to vote on additional pollution reduction programs. State and federal policy makers will use your votes and those from others to choose the best program to improve water quality.

Important instructions

In the questions that follow, we ask your opinion about programs that have different impacts on the Chesapeake Bay and Watershed Lakes. These programs will cost your household different amounts.

You will be asked three questions. In each question you will vote for the option you like best from three different alternatives:

- OPTION A keeps all current actions but does not add new programs
- OPTION B and OPTION C include additional programs to reduce pollution

Choosing OPTION A in each question would result in no new pollution reductions or costs to your household.

OPTION B and OPTION C are different in each question, with different environmental outcomes and costs to your household.

An Example Question is on the next page to show you what the questions will look like.

Other households are also being surveyed, so please only think of the costs to your own household when deciding which program you would prefer.

Similar studies have shown that people sometimes respond differently in a survey than they would in real life, often saying they would pay more than they really would. **When voting we urge you to respond as though costs to your household would really go up if the program were implemented.**

An Example Question

In each question, you will be asked to vote on three options. (Mark one box at the bottom of each question to indicate which option you prefer.)

Environmental Outcomes from each option are listed here. The percent changes compared to today are also shown in parentheses.

Annual Cost to your household is listed here. Notice that *higher costs do not necessarily mean that all environmental outcomes will improve more.*

Conditions in 2025			
(% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3.3 feet (10% increase)	4.5 feet (50% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	26 million fish (8% increase)	26 million fish (8% increase)	30 million fish (25% increase)
Blue Crab Adult Population	260 million crabs (4% increase)	340 million crabs (36% increase)	260 million crab (4% increase)
Oysters Population	4,300 tons (30% increase)	5,250 tons (59% increase)	4,300 tons (30% increase)
Watershed Lakes Lakes with low algae levels	3,100 lakes (7% increase)	3,600 lakes (16% increase)	3,850 lakes (33% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$40 every year or \$3.33 every month	\$180 every year or \$15 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <input checked="" type="checkbox"/>	Option B <input checked="" type="checkbox"/>	Option C <input checked="" type="checkbox"/>

To vote for **Option A**
mark this box

To vote for **Option B**
mark this box

To vote for **Option C**
mark this box

When you vote on the next questions, please remember...

- There will be three sets of voting questions. Consider each question separately. Imagine that the options in that question are the only ones available to choose from.
- Options in different questions should not be compared to each other.
- Do not add up effects or costs across different questions.
- The environmental outcomes in each question are based on the best scientific predictions available. Please vote as if these outcomes would actually occur in the year 2025.

7. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3.3 feet (10% increase)	3.3 feet (10% increase)	3.5 feet (17% increase)
Striped Bass Adult Population	26 million fish (8% increase)	30 million fish (25% increase)	26 million fish (8% increase)
Blue Crab Adult Population	260 million crabs (4% increase)	260 million crabs (4% increase)	260 million crabs (4% increase)
Oysters Population	4,300 tons (30% increase)	5,500 tons (67% increase)	4,300 tons (30% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	3,100 lakes (7% increase)	3,600 lakes (24% increase)	3,600 lakes (24% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$500 every year or \$41.67 every month	\$250 every year or \$20.83 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

8. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

Conditions in 2025 (% change compared to today)			
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3.3 feet (10% increase)	3.5 feet (17% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	26 million fish (8% increase)	26 million fish (8% increase)	26 million fish (8% increase)
Blue Crab Adult Population	260 million crabs (4% increase)	312 million crabs (25% increase)	312 million crabs (25% increase)
Oysters Population	4,300 tons (30% increase)	10,000 tons (203% increase)	10,000 tons (203% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	3,100 lakes (7% increase)	3,850 lakes (33% increase)	3,350 lakes (16% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$60 every year or \$5.00 every month	\$20 every year or \$1.67 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

9. Please vote for one of the three options below. (*Mark one box at the bottom to indicate which option you would prefer.*)

	Conditions in 2025 (% change compared to today)		
Environmental Outcomes	Option A	Option B	Option C
Bay Water Clarity Average visibility	3.3 feet (10% increase)	4.5 feet (50% increase)	4.5 feet (50% increase)
Striped Bass Adult Population	26 million fish (8% increase)	35 million fish (46% increase)	35 million fish (46% increase)
Blue Crab Adult Population	260 million crabs (4% increase)	340 million crabs (36% increase)	312 million crabs (25% increase)
Oysters Population	4,300 tons (30% increase)	4,300 tons (30% increase)	5,500 tons (67% increase)
Watershed Lakes Lakes with <u>low</u> algae levels	3,100 lakes (7% increase)	3,600 lakes (24% increase)	3,600 lakes (24% increase)
Your Cost of Living Permanent cost increase for your household starting next year	\$0 every year	\$40 every year or \$3.33 every month	\$20 every year or \$1.67 every month
Your Vote Please mark <u>one</u> of the boxes to the right	Option A <div></div>	Option B <div></div>	Option C <div></div>

Thinking about how you just voted...

10. Please rate how much you agree or disagree with the following statements.

	Strongly Disagree			Strongly Agree		Don't Know
I voted as if my household would actually face the costs shown in the questions.	1	2	3	4	5	DK
I voted as if the programs would actually achieve the results shown by 2025.	1	2	3	4	5	DK
If new programs were implemented, I would expect to see some environmental improvements before 2025.	1	2	3	4	5	DK
I would vote differently if the programs took longer to achieve the results shown.	1	2	3	4	5	DK
It is important to improve waters in the Chesapeake Bay Watershed, no matter how high the costs.	1	2	3	4	5	DK
I am against any more regulations and government spending.	1	2	3	4	5	DK
My household should not have to pay any amount to improve Bay Waters and Watershed Lakes.	1	2	3	4	5	DK
It is difficult for me to find time to take surveys.	1	2	3	4	5	DK

11. How much do you agree or disagree that the following *affected your vote*?

(Please circle one number for each statement.)

	Strongly Disagree			Strongly Agree		Don't Know
Changes in the quality or price of seafood	1	2	3	4	5	DK
Impacts on the economy and jobs	1	2	3	4	5	DK
Improving the environment for others	1	2	3	4	5	DK
Water quality improvements to lakes <i>outside</i> the Chesapeake Bay Watershed	1	2	3	4	5	DK
Preserving the environment for future generations	1	2	3	4	5	DK
Trips I may take to the Chesapeake Bay or Watershed Lakes in the future	1	2	3	4	5	DK

12. In the last 12 months, how many times did you visit an outdoor recreation site on the Chesapeake Bay? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
---	---	---	---	---	---	---

13. If you did visit one or more sites on the Chesapeake Bay in the last 12 months, which site did you visit most often? *(Fill in as much information as you can)*

13a. Name of site _____

13b. How long did it take you to drive there from your home?
_____ hours and _____ minutes

13c. What state is it in? _____

13d. What is the nearest town? _____

13e. What did you do on your visit(s) to that site? *(Check all the activities you did on your visits)*

☐ Fishing and/or crabbing

☐ Swimming

☐ Boating, canoeing or kayaking

☐ Camping

☐ Hunting

☐ Hiking

☐ Bird watching or wildlife viewing

☐ Other _____

14. In the last 12 months, how many times did you visit a lake, stream, or river in the Chesapeake Bay Watershed? *(Please circle one number.)*

0	1	2	3	4	If more than 4, write in number of trips: _____	Don't Know <input type="checkbox"/>
---	---	---	---	---	---	---

15. Many people are looking for ways to reduce their utility bills. If you were offered a device that cost \$200 and would reduce your household electricity bill by \$2 each month for the next 10 years, would you purchase the device?

☐ Yes

☐ No

☐ Don't know

Questions about you and your household

Finally, we would like to ask a few questions about you and your household. Your answers will not be saved or stored in a way that can be associated with your name or address. You will not be contacted about your responses or this survey.

- 16. What is your sex?** ☐ Male ☐ Female
- 17. What is your age?** _____ years old
- 18. How many children under age 18 are living in your home?** _____ children

19. Have you or any member of your family ever worked in any of the following industries or jobs?

- ☐ Agriculture ☐ Tour guide for fishing
- ☐ Commercial fishing ☐ Environmental non-profit group
- ☐ No one in my family ever worked in these industries

20. In 2012, what was your total pre-tax household income, including all earners in your household?

- ☐ Under \$25,000 ☐ \$100,000-\$149,999
- ☐ \$25,000-\$49,999 ☐ \$150,000-\$199,999
- ☐ \$50,000-\$74,999 ☐ \$200,000 or more
- ☐ \$75,000-\$99,999

21. Are you of Hispanic, Latino, or Spanish origin? ☐ Yes ☐ No

22. What is your race? *(Select one or more.)*

- ☐ American Indian or Alaska Native ☐ Asian
- ☐ Black or African American ☐ White
- ☐ Native Hawaiian or Other Pacific Islander

23. What is the highest degree or level of school you have completed?

- ☐ Elementary or high school, but no high school diploma or GED
- ☐ High school diploma, GED, or other high school completion
- ☐ Some college credit, no degree
- ☐ Associate's Degree (for example: AA, AS)
- ☐ Bachelor's Degree (for example: BA, BS)
- ☐ Master's degree, professional degree, or doctorate degree
(for example: MA, MSW, MD, DDS, JD, PhD, EdD)

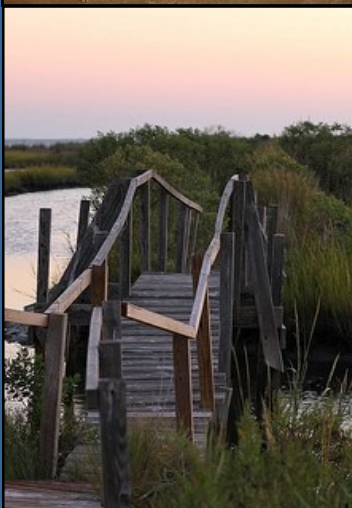
Thank you very much for your help.

Please mail this completed survey back to us in the postage-paid return envelope provided.



Thanks again for completing this survey!

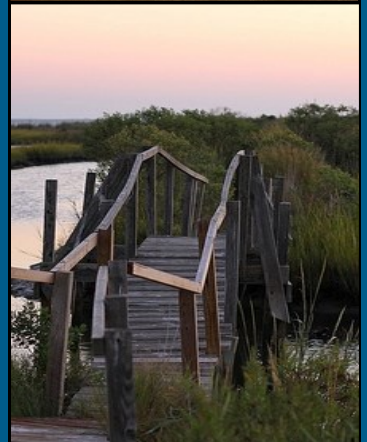
If you have any additional thoughts about any of the topics covered or the survey itself, please share them here.



**If you have any questions please call 617-520-2476
or email chesapeake_survey@abtassoc.com.**

The Future of the Chesapeake Bay

A Brief Survey



The Clean Water Act authorizes collection of this information. All responses will be kept confidential to the extent permitted by law. Response to this survey is voluntary and no action will be taken against you if you choose not to take part. The public reporting burden for this form is estimated to average 5 minutes per response. Send comments regarding the burden estimate or any other aspect of this form to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the survey materials to this address.

The Chesapeake Bay Watershed

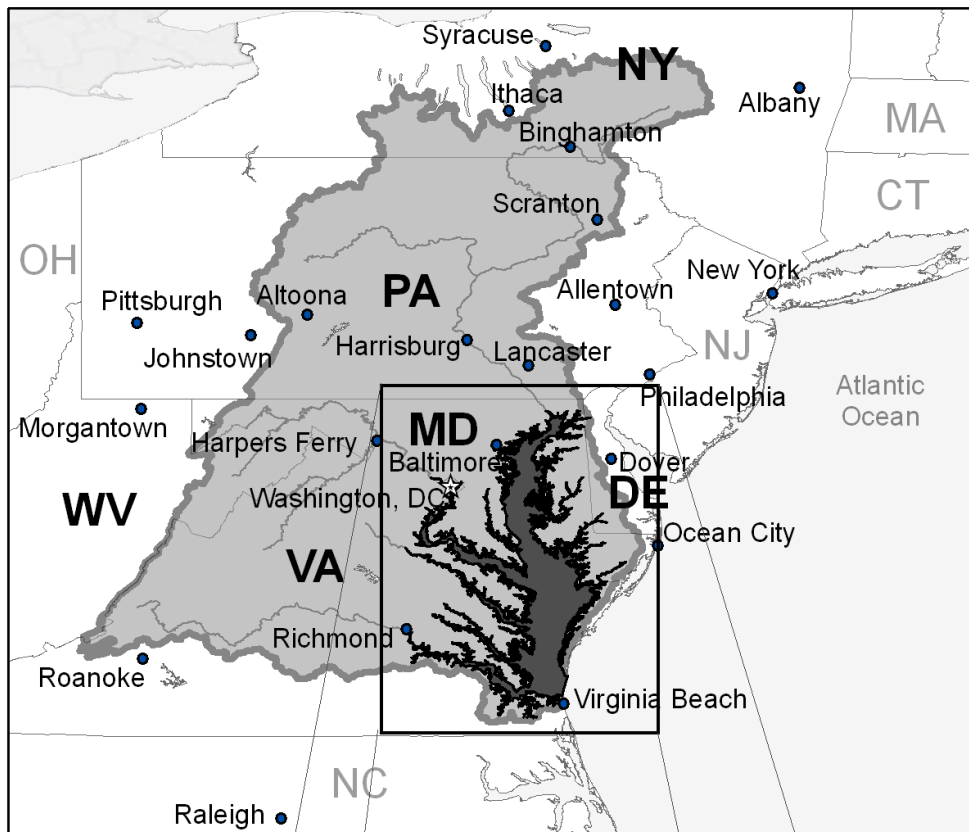
This survey asks you about two types of water bodies in the Chesapeake Bay Watershed — the Chesapeake Bay itself and Lakes in the Watershed. Each has different characteristics and potential water quality concerns.

The Watershed

Is shaded in light grey on this map.

It includes about 4,200 freshwater **lakes**.

Water draining from lands in the Watershed enters rivers and streams and eventually the Chesapeake Bay.



The Chesapeake Bay

Is an estuary where freshwater mixes with saltwater from the ocean. It is the largest estuary in North America and the third largest in the world.

As shown in dark grey on this map, the Bay includes portions of the 50 rivers that flow into it, for example:

- The James River up to Richmond, VA
- The Potomac River up to Washington, DC

Please use this definition of the Chesapeake Bay when answering questions on this survey.



1. Before receiving this survey, had you heard of the Chesapeake Bay?

☐ Yes

☐ No

☐ Don't know

2. On average, how often do you see the following water bodies?

(Please check ONLY ONE box in each row.)

	Never	Less than once a month	More than once a month	Don't Know
Chesapeake Bay:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watershed Lakes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. In the last five years, have you participated in recreational activities (including swimming, boating, fishing, or viewing nature) in the following water bodies? *(Please check ONLY ONE box in each row.)*

Chesapeake Bay:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
Watershed Lakes:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know

4. Before taking this survey, were you aware that too much nutrients or sediment can degrade water quality?

☐ Yes

☐ No

☐ Don't know

5. Please rate how much you agree or disagree with the following statements

(Please circle one number for each statement.)

	Strongly Disagree				Strongly Agree	Don't Know
It is important to improve waters in the Chesapeake Bay Watershed, no matter how high the costs.	1	2	3	4	5	DK
I am against any more regulations and government spending.	1	2	3	4	5	DK
My household should not have to pay any amount for programs to improve Bay Waters and Watershed Lakes.	1	2	3	4	5	DK
It is difficult for me to find time to take surveys.	1	2	3	4	5	DK

Please turn the page. —>

Questions about you and your household

Finally, we would like to ask a few questions about you and your household. Your answers will not be saved or stored in a way that can be associated with your name or address. You will not be contacted about your responses or this survey.

6. What is your sex? ☐ Male ☐ Female

7. What is your age? _____ years old

8. How many children under age 18 are living in your home? _____ children

9. Have you or any member of your family ever worked in any of the following industries or jobs?

- | | |
|--|---|
| <input type="checkbox"/> Agriculture | <input type="checkbox"/> Tour guide for fishing |
| <input type="checkbox"/> Commercial fishing | <input type="checkbox"/> Environmental non-profit group |
| <input type="checkbox"/> No one in my family ever worked in these industries | |

10. In 2012, what was your total pre-tax household income, including all earners in your household?

- | | |
|--|--|
| <input type="checkbox"/> Under \$25,000 | <input type="checkbox"/> \$100,000-\$149,999 |
| <input type="checkbox"/> \$25,000-\$49,999 | <input type="checkbox"/> \$150,000-\$199,999 |
| <input type="checkbox"/> \$50,000-\$74,999 | <input type="checkbox"/> \$200,000 or more |
| <input type="checkbox"/> \$75,000-\$99,000 | |

11. Are you of Hispanic, Latino, or Spanish origin? ☐ Yes ☐ No

12. What is your race? *(Select one or more.)*

- | | |
|--|--------------------------------|
| <input type="checkbox"/> American Indian or Alaska Native | <input type="checkbox"/> Asian |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> White |
| <input type="checkbox"/> Native Hawaiian or Other Pacific Islander | |

13. What is the highest degree or level of school you have completed?

- ☐ Elementary or high school, but no high school diploma or GED
- ☐ High school diploma, GED, or other high school completion
- ☐ Some college credit, no degree
- ☐ Associate's Degree (for example: AA, AS)
- ☐ Bachelor's Degree (for example: BA, BS)
- ☐ Master's degree, professional degree, or doctorate degree
(for example: MA, MSW, MD, DDS, JD, PhD, EdD)

Thank you very much for your help.

Please mail this completed survey back to us in the postage-paid return envelope provided. If you have any questions please call 617-520-2476 or email chesapeake_survey@abtassoc.com.

Stated Preference Estimation of Benefits from the Chesapeake Bay TMDLs

Focus Group and Cognitive Interview Summary

June 19, 2012

This report summarizes the main findings from the ten focus groups and three sets of cognitive interviews conducted as part of the design and pre-testing of the Chesapeake Bay Watershed stated preference survey.

The ten focus groups took place in the following locations on these dates:

- | | |
|-------------------|---------|
| 1. Baltimore, MD | 1/12/12 |
| 2. Baltimore, MD | 1/23/12 |
| 3. Richmond, VA | 2/01/12 |
| 4. Richmond, VA | 2/02/12 |
| 5. Washington, DC | 2/29/12 |
| 6. Washington, DC | 3/01/12 |
| 7. Harrisburg, PA | 3/26/12 |
| 8. Harrisburg, PA | 3/27/12 |
| 9. Raleigh, NC | 4/16/12 |
| 10. Raleigh, NC | 4/17/12 |

Each focus group was composed of seven to ten individuals that were randomly selected by the focus group facilities. Participants were eligible if they were eighteen years of age or older, if they were not full-time students, and if they had not participated in a survey or focus group in the last six months. A college degree was a requirement for some focus groups, but not for others. Each of the focus groups included individuals with diverse socioeconomic backgrounds, based on characteristics such as income, marital status, age, race, education, occupation, and gender. Participants were compensated for their participation in the focus groups. Each focus group session was approximately two hours long. All sessions were video recorded.

Cognitive interviews took place in the following locations on these dates:

- | | |
|-----------------------------------|---------|
| 1. Washington, DC (10 interviews) | 5/03/12 |
| 2. Richmond, VA (8 interviews) | 5/08/12 |
| 3. Harrisburg, PA (8 interviews) | 5/11/12 |

Interviews were conducted one-on-one primarily using a think aloud technique. Interview subjects were randomly selected by the focus group facilities using the same eligibility rules applied to the focus groups. All interviews were audio recorded.

Between each focus group and set of interviews the survey instruments were revised based on feedback from respondents. Detailed summaries of each focus group and set of interviews are available as separate reports.

Focus Groups Overview

Focus Groups 1 and 2 (Baltimore, MD)

Focus Group 1 was conducted in Baltimore, MD and focused on four main objectives:

1. Identifying popular recreation areas near the Bay
2. Identifying aspects of the natural environment in or around the Bay itself that are important to the participants
3. Discussing the best way to communicate levels of different aspects of the Chesapeake Bay to respondents (e.g., fish populations)
4. Exploring payment vehicles.

For recreational purposes, respondents identified cleanliness of waters and presence of wildlife and healthy vegetation as important elements of the natural Bay. Outside of recreational opportunities, aquatic life (e.g., population, subaquatic vegetation) was also important. Respondents in this group did not exhibit strong preferences for particular species, but thought in terms of broad categories such as fish and shellfish, and preferred to think about these in terms of changes in absolute number of fish, percent differences, and total stock size. Respondents also indicated that water quality was important to them as an input for plants and animals, but also as something they care about directly. Respondents focused on clarity as a measure of quality, and did not necessarily care about algae blooms, dead zones, and red tides, in part because these terms were unfamiliar and too technical.

The discussion on potential payment vehicles revealed that people believed they were already paying for Chesapeake Bay restoration efforts through separate assessments or as additions to their water bills. There was some indication of willingness to pay additional amounts for Bay improvements and suggestions included taxes and recreational fees.

Focus Group 2, also in Baltimore, pursued the first three questions from Focus Group 1 in addition to responses on some basic choice questions.

Participants were provided with a detailed listing of Bay environmental attributes and asked to select those important to them or to add their own. “Suitable for aquatic life” was the most widely appreciated attribute, but this was largely because the term was considered all-encompassing. Several species were identified as important, including rockfish, blue fish, crab, oysters, and bird species. Clarity was identified as an aspect of the environment that was important, but was not as prominent as a key indicator as it was in Focus Group 1; some participants noted that they expect the water in the Bay to be murky given the nature of the water body. There were no preferred metrics for providing information on changes in the attributes.

When presented with some basic choice questions the group and participants were generally willing and able to consider tradeoffs of money for changes in different attributes. They seemed particularly concerned about stalling a worsening baseline (i.e., preventing further declines in environmental quality

in the future). More information on the timing of payments and improvements is needed to pursue these tradeoffs in more detail.

Focus Groups 3 and 4 (Richmond, VA)

Focus Group 3 was conducted in Richmond, VA. This focus group pursued the same goals as in the Baltimore focus group 2, in part to assess regional variation in important endpoints or aspects of the natural environment. Thus, the main goals of the focus group were to:

1. Identify popular recreation areas near the Bay
2. Identify aspects of the natural environment in or around the Bay itself that are important to the participants
3. Determine the best way to communicate levels of different aspects of the Chesapeake Bay (i.e., endpoints)
4. Obtain reactions to simple choice questions.

Respondents here identified many of the same important attributes as those in the Baltimore focus groups, with a particular emphasis on the water being safe for humans and wildlife, clarity, the ability to support aquatic life, and the number of fish and shellfish (expressed as crabs, oysters, or both). Other aspects raised by respondents included “clean beaches,” nice views, and that the Bay be “clean and natural.” Most respondents acknowledged a preference for improvements to the rivers, in particular the James River, due to the proximity to where they live and recreate. Many respondents noted a potential tradeoff between benefits from industry and recreational uses along the Bay. Respondents also suggested that improvements to the Bay would need to be the result of concerted effort across states because so many rivers enter the Bay.

Focus Group 4 was also conducted in Richmond. The main goals of the focus group were to:

1. Assess the effectiveness and clarity of draft text with background information on the state of the Bay
2. Assess reactions to simple choice questions

Participants were asked to read a description of the state of the Bay, and then were presented with a set of structured choice questions with varying attributes, but no costs.

Reactions to the background text suggested that a simpler depiction of the ecological production function of the Chesapeake Bay and related waters was necessary. Some terms were difficult for participants to understand (e.g., “deep water refuge”) and many participants did not make key connections between precursors affected by policy (e.g., sediment) and environmental consequences (e.g., clarity). Generally, respondents wanted clearer information about sources of pollutants and their effects on the environment.

As presented, respondents generally had difficulty trading off among attributes. This could be in part because a cost attribute was not included in these preliminary choice questions, or perhaps because the focus group started with an overview of the entire Bay, rather than eliciting and identifying attributes individuals care about. The need for a more solid ecological production function was apparent: participants had a difficult time thinking of the fish as anything but food, and some found the inclusion of clarity confusing as its importance to the ecosystem had not been established. However, there was some indication that clarity was a good proxy for recreational endpoints. Finally, respondents expressed a desire for an index to describe overall Bay health.

Focus Groups 5 and 6 (Washington, DC)

Focus Group 5 was conducted in Washington, DC. The main goal of this focus group was to compare two versions of a draft survey instrument that differed by whether the quality of the Bay was described in terms of attributes that are ecological “inputs” (dissolved oxygen, sub-aquatic vegetation, clarity) or by endpoints or ecological outputs or “endpoints” (water quality score, game fish, crabs, oysters). Several alternative formats and representations of the choice questions were also presented to respondents.

Most participants preferred the endpoint attributes because they were more tangible and closer to things they care about directly. Some respondents wanted input attributes along with these endpoints. Generally, it wasn’t clear whether participants cared about these attributes independently or whether they served together to define overall quality of the Bay. Many liked the use of a water quality score as an overall measure, but wanted more information to make it more tangible.

There was some confusion about how input attributes were defined and what they were really capturing. Some discussion suggested that attribute levels were not being considered independently, e.g., “dissolved oxygen helps sub-aquatic vegetation therefore care about dissolved oxygen” (but both are independently represented in choice questions). This suggested that if inputs were to be used in the survey, the ecological production function (i.e., the link between the inputs and the endpoints) would need to be more carefully described.

Other issues raised during the focus group included tourism and economic impacts; how payments would be allocated among businesses, farms, individuals, and states; and potential “upstream benefits” beyond the Chesapeake Bay itself.

Focus Group 6 was also conducted in Washington, DC. The primary goals were to continue testing “input version” and an “endpoint version” of the survey, and to evaluate alternative presentations of choice scenarios.

Most participants preferred the endpoint survey because they could relate to the attributes better and because the information treatment for the inputs version was too technical. Some respondents wanted the more technical information, however. This suggested that a unified information treatment, compromising between the levels of background and detail in these two instruments, was desirable.

Other important findings from the focus group included a preference for arrows indicating the direction of a change in attribute levels, rather than a graph showing changes over time; willingness to pay amounts almost always exceeded the \$135/year maximum in the choice questions; and people found it useful to have both monthly and annual costs.

Focus Groups 7 and 8 (Harrisburg, PA)

Focus Group 7 was conducted in Harrisburg, PA largely to assess how respondents farther out in the watershed would react to the survey. Other goals included testing a figure to depict the ecological production function, testing different presentations of water quality indicators, evaluating the inclusion of an “upstream” attribute to reflect environmental improvements beyond the Bay tidal waters, and testing a payment vehicle.

Participants were first given the “input version” of the survey and then were given the “endpoint version.” In both versions, participants generally found the ecological production function figure redundant with what was provided in other parts of the survey, and did not react well to specific graphics within it.

There was an approximately even split between preference for the inputs (dissolved oxygen, water clarity, aquatic grasses) vs. the endpoints (water quality scores, striped bass, blue crab, oysters) versions of the survey. Respondents also believed a third version of the survey that included only water quality indices did not provide enough information for making choices.

Participants reacted well to inclusion of the freshwater attributes. Several focused first on that when answering choice questions, although there was general agreement that doing something for the Bay was important. Some participants were unable to separate upstream attributes from Bay attributes, suggesting the survey needs to better specify how these may change independently.

All participants selected a program rather than the status quo at the costs in the survey drafts. It was still difficult to conclude whether participants held values for the individual attributes and considered tradeoffs among them, or were interested in improving water quality in general and seemed to just pick the program that cost the least.

Participants accepted the payment vehicle as a permanent cost-of-living increase, and none admitted that they thought they could escape the costs. Two respondents indicated that the permanent nature of the payment figured prominently in their choices, but suggested that any time period of 10+ years might as well be permanent.

Focus Group 8 was also held in Harrisburg, PA with the same goals as Focus Group 7. The order of the survey versions was reversed.

Reactions to the survey versions were similar to Focus Group 7, with a split between input and endpoint versions of the survey (five to three). Framing attributes in terms of the percent of water segments in compliance with standards seemed to help respondents put the attribute levels in perspective. They also liked that the input version included a diversified set of attribute metrics, and found that attributes expressed as feet and acres were especially easy to relate to.

Participants seemed willing to pay money to improve the Bay. They did not question why they have to pay for the cleanup, which weakly suggests an acceptance that they contribute to the degradation, or at least bear some responsibility towards its improvement.

Respondents generally accepted the inclusion of a freshwater upstream attribute(s). It was unclear whether they necessarily favored upstream water quality more than in the Bay. This was surprising given Pennsylvania's abundance of small streams and lakes, and the fact that the State is not adjacent to the Bay. On the other hand, most respondents seemed to be nonusers of both the Bay and upstream waters. The independence of freshwater and bay water quality attributes needs to be further emphasized in the text.

Respondents seemed to value individual attributes, but it was unclear whether they necessarily hold shadow values for the individual attributes. In other words, in some cases respondents may simply have been focusing on one attribute or another, but in fact valuing the same thing. For example, some people valued oysters because they filter the water, so essentially the good they valued was water quality or overall Bay health (which is redundant with other attributes, such as the water quality score). This suggested that the independence of attributes must be further emphasized in the text, and any text promoting perceptions of dependence among attributes should be reduced.

Lastly, we also experimented with a payment vehicle consisting of five years of payment going into a fund to support the program indefinitely. This payment vehicle did not work well, and led to many open

questions. Participants also did not believe fees under this payment vehicle would actually end after 5 years.

Focus Groups 9 and 10 (Raleigh, NC)

Focus Group 9 was held in Raleigh, NC in part to test for the salience of TMDL-related improvements in a state that is nearby, but is not part of the Chesapeake watershed. Other goals included testing a unified information treatment, and evaluating whether a cost-of-living payment vehicle would work beyond watershed states. Again, an “input version” and an “endpoint version” were tested.

The group was primarily non-users, but participants seemed to understand the map and scope of the Chesapeake Bay and watershed. Responses were generally positive for the unified information treatment, including the figure on the ecological production function.

Participants accepted the payment vehicle as realistic and feasible. There was some initial confusion from a few participants as to whether they should be responding as themselves, or as someone who lives within the watershed. After clarifying this, participants accepted the payment vehicle, although some thought the presentation should be simplified and that it should be clearer on which costs occur to those inside versus outside the watershed.

Participants were able to complete both versions of the survey, but all preferred the endpoint version because it was more salient; it was not clear to them how inputs related to potential endpoints they care about.

Part of the preference for the endpoint version also appeared to be presentational. Several participants noted that the small graphics for that attributes (line drawings of a fish, crab, and oysters) made it more appealing. Also, the use of indicator arrows for increases and decreases was preferred to the inputs versions that did not contain these indicators. This suggested a need to make the versions visually commensurate.

Everyone chose one of the two improvement programs, although most would never or rarely see use benefits. Few respondents chose the status quo at the costs presented. However, when program costs exceeded \$100 per year there was a shift away from that alternative even when it offers larger benefits, suggesting price sensitivity at levels above this.

Focus Group 10 was held in Raleigh, NC with many of the same objectives as Focus Group 9. We also wanted to test whether respondents would accept choice questions where environmental quality was held constant in 2025 under the status quo or “No Further Action” option.

This group, for the most part, consisted of nonusers, some of which had not even heard of the Chesapeake Bay. The distinction between the Bay (“tidal waters”) and upstream confused some, suggesting we needed to emphasize this more clearly in the text.

Respondents seemed accepting of both versions of the survey, with a slight preference towards the “endpoint” version. Respondents found water quality scores to be difficult to comprehend and evaluate, although the numbers were easier to understand.

Participants stated they are willing to pay for improvements to the Chesapeake Bay watershed. This included nonusers whose WTP reflected bequest and existence values. Somewhat higher cost options for the instruments in this focus group increased “no further action” responses.

Participants seemed to accept the general cost of living payment vehicle, but the information needed to be presented more clearly and succinctly with a greater emphasis on what costs occur within versus outside of the watershed. Similarly, respondents appeared to accept a constant baseline scenario (i.e., no projected decline in environmental attributes in the absence of policy), but wanted a clear justification and information to support this, such as examples of current programs that are already in place.

Cognitive Interviews Overview

Cognitive Interview Set 1 (Washington, DC)

This set of interviews tested input and endpoint versions of the survey, with constant and declining baselines. For all sets of interviews respondents were only given one version of the survey. Due to new information on upstream modeling limitations, the upstream attribute was now presented as a Lake Condition attribute (replacing the upstream water quality index). This had the advantage of being more concrete than the water quality index score, which prior focus groups had found difficult to understand.

The Lake Condition attribute refers to the trophic state of a lake and is described on the survey using visibility, water color, and dominant types of fish. The attribute was received well by the subjects and seemed to work fine in the choice questions.

A potential problem that came up in multiple interviews was that on the distinction between the parts of the watershed (tidal vs. upstream) was sometimes forgotten by the time respondents came to the choice questions. This suggested a need to better clarify this distinction so that it “sticks” throughout the survey.

There were two different problems with the payment vehicle. One respondent did not understand why her water bill would increase and another confused the “cost of living” increase with general inflation, and assumed salaries would increase to offset it.

The endpoint version of the survey worked well with respondents, who were able to evaluate the attribute levels, tradeoffs, and make an economic decision.

Most subjects responded well to the input version, accepting the attributes and evaluating program options based on them. One respondent had difficulty and wanted to have information on endpoints rather than inputs. He answered the questions, but based responses largely upon his general knowledge of water quality in the area rather than specific input attribute levels.

Several respondents had suggestions for wording improvements and clarity, and some felt the survey was long. At the same time, however, some wanted more information.

Aside from these issues, the interviews went relatively smoothly. Most subjects were able to follow the information treatment, accepted the payment vehicle, evaluated attribute levels, and considered tradeoffs between attributes when answering the choice questions. Several respondents indicated they would choose the “No Action” status quo based on an evaluation of the cost and the described improvements.

Cognitive Interview Set 2 (Richmond, VA)

Four subjects were given the endpoint version of the survey with a worsening baseline. All subjects accepted the scenarios and payment vehicle. Throughout the survey we relabeled the “Upstream

sections” of the bay as “Lakes and rivers,” which eliminated confusion regarding the two regions of the watershed. Providing an example question prior to the choice scenarios helped to familiarize the subjects with the question layout before they were asked to make a choice.

Four subjects were given the input version of the survey with a worsening baseline. All subjects accepted the scenarios and payment vehicle, but one needed some additional statements that all else was the same across these options. She was mainly concerned about equity in costs and had concerns about ancillary benefits and costs pertaining to how the program would be implemented, and who would regulate it.

Overall, subjects were careful to analyze trade-offs among the attributes and costs across the different alternatives.

Most commented on the length of the survey but acknowledged that all the material is necessary to answer the choice experiment questions. Some suggested a strong cover letter is needed to emphasize how important it is to complete the survey.

Cognitive Interview Set 3 (Harrisburg, PA)

Four subjects were given the input version of the survey with a declining baseline. Most subjects accepted the scenarios and payment vehicle, but one found the choice questions difficult and confusing and ultimately did not make decisions based on attribute levels. Generally, respondents were able to answer the program choice questions, although the description of the dissolved oxygen criterion was difficult for two subjects. One subject didn’t fully understand the goals, while a second was concerned that changes in dissolved oxygen involved a chemical process with ambiguous risks. This suggested a need to clarify the description of the dissolved oxygen attribute.

Because the survey instrument had worked well in prior interviews, we probed deeper on some particular issues on how respondents approached the choice questions. For the input version of the survey, respondents seemed to first look at the cost of the programs to see if any were affordable and then tended to support the lower cost option. Some respondents noted lake condition and clarity as key factors in their decisions, but did not exhibit strong preferences across the other attributes. These two observations are not so surprising given that most participants had never visited the Bay. Nonusers may have positive WTP without strong preferences over attributes.

Similar results were obtained from four interviews using the endpoint version of the survey with a declining baseline. All of the subjects accepted the scenarios and payment vehicle, but one had difficulty understanding why conditions for the other Bay attributes (fish and shellfish) wouldn’t necessarily increase if the Water Quality score (capturing improvements in clarity and DO) improved. (The Water Quality score attribute was ultimately dropped in favor of clarity, which seemed more salient to most respondents.)

Most subjects first looked at the cost of the programs to see what they could afford then proceeded to look at the other attributes provided. Lake condition seemed to be the driver for those that selected programs coupled with the desire to see some increase among the fish populations. Subjects did not have strong preferences about which species they preferred, but choices were sensitive to large improvements in the attributes. Water quality conditions in the Chesapeake Bay did not figure prominently in most subjects’ decision making, although one subject noted that this was the most important of them all.

Most respondents suggested that it would be useful to have information early in the instrument to describe what was going to be asked later in the survey.

Additionally, some location information wasn't fully clear, including where the Susquehanna and key cities were located on the map and whether there were any nearby lakes. A more detailed map was suggested.