



Promoting Community Involvement and Opinion Leadership in Protection of the Salt Marshes of Blackwater National Wildlife Refuge

An analysis of audience and program participant surveys conducted for
Pickering Creek Audubon Center



July 2016

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This report was funded through a grant from the Town Creek Foundation of Easton, Maryland to Audubon for the support of Pickering Creek Audubon Center's salt marsh community engagement project, "Salt Marsh Stories."

Photo of Blackwater National Wildlife Refuge courtesy of K. Akerlof

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Executive summary

The research conducted for this report is intended to benefit the development of Pickering Creek Audubon Center's outdoor experiential "Salt Marsh Stories" program at Blackwater National Wildlife Refuge. Audubon MD-DC works with U.S. Fish and Wildlife Service, The Conservation Fund, and other governmental and non-profit actors to restore the salt marshes of the refuge and prepare for their migration with the advance of sea level rise. Pickering Creek's presence in nearby Talbot County and expertise in environmental education positions the center to play a critical role in public outreach and engagement paralleling these salt marsh research and preservation efforts.

The full study includes stakeholder interviews captured in a 2015 report,¹ and a set of two surveys described in this document: a baseline of audiences, and assessments from program participants. The interviews and surveys address four focal audiences for Pickering Creek Audubon Center's salt marsh engagement: business and faith communities in Dorchester and Talbot counties, students and faculty from higher education institutions on the Eastern Shore, and Audubon chapter members and affiliates. The baseline survey addresses all four groups, while the Blackwater NWR trip participant survey includes just Audubon and higher education.

Audience findings

- The salt marshes are not a salient issue for most people. Substantial percentages of those from higher education institutions, and the business and faith community, say that they are not at all knowledgeable or think about the salt marshes (34%/40%, higher education; 33%/44%, business community; 25%/34%, faith community).
- Almost half of higher education, business, and faith audiences never talk about the salt marshes (45%-55%), or hear people they know talk about them (41%-48%).
- Uncertainty whether sea level rise is occurring is high, much higher than for climate change. Only 48% say that they are very or extremely sure that sea level rise is currently happening along Maryland's coastlines. Members of the business community are most likely to say that they are not at all knowledgeable about sea level rise (38%), or do not think about it at all (36%). Only 30% say they are very or extremely sure sea level rise is happening.
- People assume that scientists are certain that sea level rise is occurring, but that those around them are not. A majority—61%—say that more than 80% of scientists think sea level rise is happening off Maryland's coastlines, but just over half (51%) say that 40% or less of people in their community and the state say the same.

Promoting opinion leadership and issue involvement

- All four focal audiences—Audubon, higher education, and faith and business communities—have individuals who rank highly on conservation communication and civic leadership. Communication leadership promoting conservation is the

¹ Akerlof, K. (2015). *Engaging Eastern Shore communities in protection of the salt marshes of Blackwater National Wildlife Refuge*. Fairfax, VA: George Mason University Center for Climate Change Communication. Available at <http://climatechangecommunication.org/climate-resilience-communication-for-the-mid-atlantic/research-supporting-outreach-programs/>

highest among those from higher education institutions and lowest among the business community.

- Place attachment to Blackwater National Wildlife Refuge is one of the strongest factors related to issue involvement and opinion leadership. It significantly predicts combined civic and conservation communication leadership, conservation communication leadership, and salt marsh issue involvement. Affinity for nature is the next most frequent significant predictor.

Program design

- Of 18 emotions listed on the survey questionnaire, on average, people experience nine during their time visiting Blackwater NWR with Pickering Creek Audubon Center. Almost half of participants (46%) say that they the primary emotion they experience while at Blackwater NWR is inspiration.
- More than half of higher education students and faculty feel a very or extremely strong sense of belonging to the group (58%), as opposed to just under half for Audubon (43%). Similarly, half of the students and faculty feel very or extremely close to other group members (50%), whereas 34% of Audubon members do.
- Higher education participants on the Blackwater trip show greater levels of emotional connectedness to the refuge compared to baseline survey data for that audience; Audubon members—already at high levels—do not. Higher education audience members also demonstrate higher levels of assessed knowledge on salt marsh and sea level rise on the later trip survey than the baseline, while Audubon affiliates do not.

Factors promoting issue communication

- The five emotions experienced during the Blackwater NWR trip that most strongly relate to intention to communicate about the salt marshes with friends and family after the trip are “inspired,” “excited,” “motivated,” “entertained,” and “breathtaking.”
- Place attachment and affinity for nature (or relatedness) are the most consistently related to intent to communicate with others about the salt marshes and sea level rise after the program, and program recommendation. Number of experienced emotions, feelings of bonding with the group, and higher scores on topic area knowledge also significantly predict salt marsh communication intent.

Recommendations

- Increase the frequency of communication on sea level rise to address high attitudinal uncertainty on the issue.
- Look for additional opportunities to promote feelings of community connectedness to the salt marshes and pride (see box, page 33).
- Recognize the times—like the salt marsh plantings—where participants engage emotionally as the points that highly relate to whether a participant voices interest in relating to others what they did and learned.
- Look for opportunities to help the group members bond and express their motivations for restoring the salt marshes to increase social cohesion and collective goal identification.

- Promote repeat visits to the marshes—and place attachment—by offering information on how to get involved in other ways.
- Ask participants what they think their friends and family know about sea level rise and the salt marshes. Encourage participants to talk with others about these issues and what they did at the refuge, letting them know their voice is important for the wider community to hear.

1. Background

Pickering Creek Audubon Center has conducted adult environmental education programs in Blackwater National Wildlife Refuge on the effects of sea level rise on salt marsh ecosystems for the last five years. Titled “Salt Marsh Stories,” this hands-on experiential program recruits residents of Maryland’s Talbot and Dorchester counties, as well university students and Audubon members from the surrounding region, to tour the refuge and contribute to its restoration through plantings of native grasses. As the program has matured, Pickering Creek has turned its attention from not just educating residents on the ecological role of the salt marshes, and their incipient threat from sea level rise, but promoting broader discourse and advocacy on behalf of their preservation.

The research captured in this report is intended to benefit the further development of Pickering Creek’s outreach program in attracting wider audiences and influencing community-wide attitudes and behaviors, particularly opinion leadership for the conservation of the salt marshes (Figure 1). Opinion leadership is believed to be one of the strongest determinants of advocacy.² Earlier studies have demonstrated low public certainty that sea level rise is occurring along Maryland’s shorelines, even among residents on the low-lying Eastern Shore (18% very/extremely sure).³

Individuals and organizations can amplify societal-level risk identification and prioritization through communication with others around them.⁴ The classic analogy for social transmission of risk signals is ripples in a pond moving outward from those who initially recognize a threat. Pickering Creek seeks to initiate the ripples in the pond by creating experiences during its daylong events that instill attachment to the salt marshes of the refuge and inspire cognitive and emotional risk responses to their potential loss, such as communication within their social networks.

1.1 Outreach program

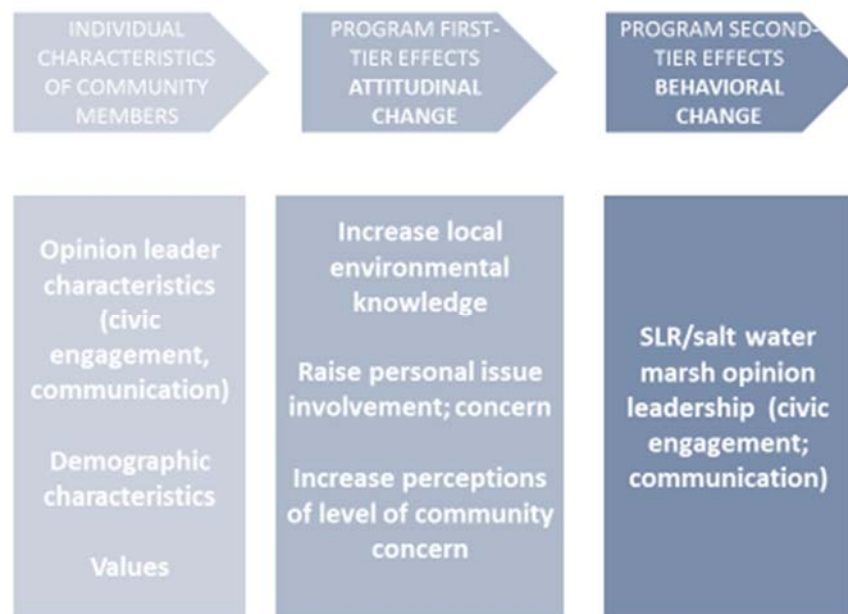
Pickering Creek Audubon Center’s Salt Marsh Stories program consists of three components: 1) an educational presentation delivered to audiences at their location; 2) tours of the national wildlife refuge to learn about its importance as part of the Atlantic Flyway for critical bird habitat; and 3) restoration of salt marsh by volunteer replanting of grass plugs in areas that have experienced ecological deterioration. In 2015-2016, the programs conducted at Blackwater National Wildlife Refuge combined a morning tour of the marsh with afternoon replanting of grasses into one daylong event.

² Nisbet, M. C., & Kotcher, J. E. (2009). A two-step flow of influence?: Opinion-leader campaigns on climate change. *Science Communication, 30*(3), 328–354.; Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: from key beliefs to political action. *Climatic Change, 125*(2), 163–178.

³ Akerlof, K., & Maibach, E. W. 2014. *Adapting to climate change & sea level rise: A Maryland statewide survey, fall 2014*. Fairfax, VA: Center for Climate Change Communication, George Mason University. Available at climatemaryland.org.

⁴ Kasperson, R. E., Renn, O., Slovic, P., Brown, H. S., Emel, J., Goble, R., ... Ratick, S. (1988). The social amplification of risk: A conceptual framework. *Risk Analysis, 8*(2), 177–187.

Figure 1. Building communication leadership in support of salt marsh protection



1.2 Research role

George Mason University’s Center for Climate Change Communication was asked to assist in supporting and assessing Pickering Creek’s efforts in 2014-2016 with audience research. The study includes a set of stakeholder interviews captured in a 2015 report, and the set of baseline audience and program participant surveys described in this document. Both the interviews and surveys address four focal audiences of Pickering Creek Audubon Center’s salt marsh engagement: business and faith communities, higher education, and regional Audubon chapters.

2. Methodology

The study components covered here include two surveys delivered between spring 2015 and spring 2016. The baseline survey was conducted online and included measures of demographic characteristics, political ideology, place attachment, knowledge, perceived social and scientific consensus, issue involvement, and opinion leadership. The second study was delivered to participants on paper after they took a tour of Blackwater National Wildlife Refuge and participated in a planting of a native salt marsh species, usually grasses. The instrument included some of the same place attachment, knowledge, and issue involvement measures as the online survey, but also questions about program characteristics and participants’ emotional responses and feelings of connectedness with others during the day.

Survey respondents were provided with a Duncan Donuts \$5 gift card for taking the online survey, and an informational brochure on refuge species for taking the paper version at Blackwater. The research was approved by George Mason University Human Subjects Review Board.

The survey data were analyzed using SPSS v. 20. In the analyses, we describe the four focal audiences, in particular factors for issue involvement and opinion leadership, and identify aspects of the program that statistically are related with increased interest among participants in wider community discussion of the salt marshes and the need to protect them from sea level rise and climate change.

2.1 Baseline survey

College students from environmental science and studies programs and Audubon chapter members have been traditional audiences for Pickering Creek Audubon Center's programming at Blackwater National Wildlife Refuge. These individuals generally do not live in the vicinity of the refuge. Because of the significance of the salt marshes to the local community, and anticipated changes in these ecosystems due to climate change and sea level rise, the Center's staff have sought to also attract local residents. In addition to higher education institutions and Audubon chapters, staff contacted businesses and faith organizations in Dorchester and Talbot counties starting in March 2015 to take an online survey measuring audience characteristics and advertise the program. They recruited from randomized lists of 83 faith organizations and 488 businesses in Dorchester County, and 55 faith organizations and 694 businesses in Talbot County.

In order to increase the frequency of survey participation from organizations not as likely to participate in the salt marsh programming, the randomized lists of organizations were again randomly split into two groups: (1) those asked to take the baseline survey and participate in the full program; and (2) those asked to only promote the survey among their team members.

These organizations formed a convenience sample of individuals from the four audiences of interest to Pickering Creek. In 2015, 14 organizations listed in Talbot County participated in the baseline online survey; another 8 organizations in Dorchester County responded. Twenty-eight organizations distributed the survey to their employees or members. They ranged from environmental groups (2) and community groups (6), to businesses (17), faith organizations (1), and higher education institutions (2). In the second year (2016), staff continued to recruit for the online survey, but primarily to augment responses from organizations within their traditional audiences. Three participated: Salisbury University, Wor-Wic Community College, and regional Audubon members. In 2015, 179 individuals completed the baseline survey; in 2016, the number was 63. The total sample size for the online survey was 242.

Within the 15-minute web-based survey, respondents were asked to self-identify as a regular attendant of religious services (once a month or more), a member in a local chapter of Audubon, a student/faculty/staff at a local institution of higher education, and/or employed in a business located in either Dorchester or Talbot counties. These categories

are not necessarily exclusive. See Table 1 for a break-down of the number of baseline survey participants across these categories by year.

While the sample size for each individual audience is small, with as much as a 15 percentage point margin of error, the differences between groups remain instructive. The margin of error for the entire baseline survey sample is between 6-7 percentage points. Confidence intervals have been provided for average responses on some of the variables to assist in visually interpreting when audience differences are meaningful.

Table 1. Number of respondents in 2015-2016 who self-identified with the focal audiences

	Are you a member of a local chapter of Audubon?	Are you a student, faculty or staff at a local institute of higher education?	Do you work for a business located in either Dorchester or Talbot counties?	Do you regularly attend religious services?
2015	39	28	54	67
2016	4	38	5	20
<i>Total</i>	<i>43</i>	<i>66</i>	<i>59</i>	<i>87</i>

The demographic composition of the baseline sample is skewed toward women (70%) and those with a 4-year college or advanced degree (54%) (Appendix A2-A7). Respondents are more evenly distributed across age categories with 41% falling between age 18 to 34 and another 33% falling between age 45 to 64. Few are ethnically Latino or Hispanic (2%) or African American (5%). The median household annual income of participants is between \$50,000 to \$74,000. The sample also tilts more liberal than conservative (39% liberal, 33% moderate, 28% conservative) (Appendix A8).

2.2 Survey of participants in daylong experiential event

The participants in the “Salt Marsh Stories” trip to Blackwater National Wildlife Refuge took an approximately 10-minute paper survey about their experiences at the end of the day. Of the 221 respondents to this survey (64 in 2015; 157 in 2016), 58 had also completed the prior online survey. Participating organizations from 2015-2016 included Audubon, Chesapeake College, Salisbury University, Washington College, and Wor-Wic Community College. Audiences in the post-survey are categorized as higher education or Audubon with any unaffiliated participants included under “all respondents.”⁵ Higher education institutions represented 77% of the sample ($n = 170$), with Audubon representing 21% ($n = 47$). The sample again is skewed on gender with more female participants (62%) than male (Appendix B1).

⁵ Organizations arrange for participation of members in the “Salt Marsh Stories” program with Pickering Creek. The division of the sample is by organizational affiliation for the purposes of the trip to Blackwater NWR.

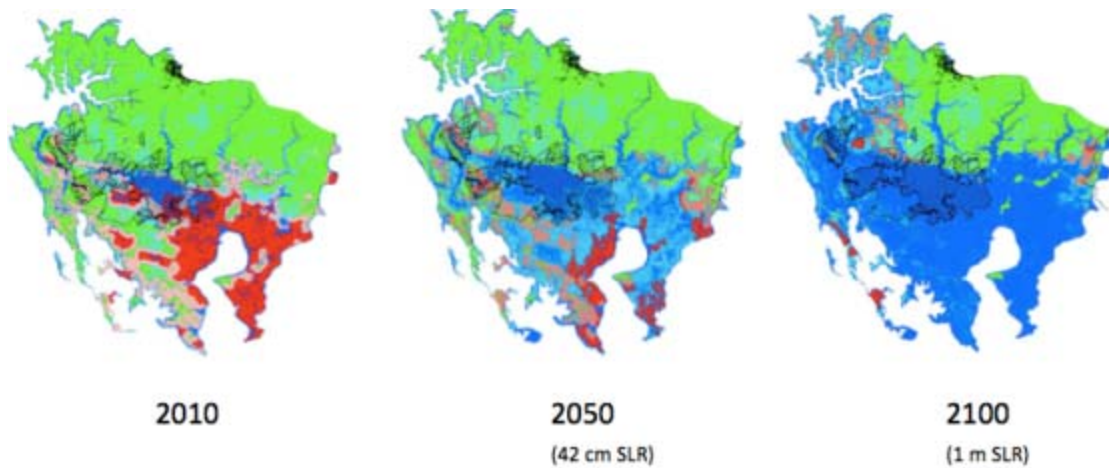
3. Characteristics of four audiences for salt marsh engagement

Wetlands riddle the interior of Dorchester County, comprising nearly half of the county including the salt marshes of Blackwater National Wildlife Refuge.⁶ The tidal marshes within this region are some of the most extensive in the United States and represent critical wildlife habitat, particularly for birds. In the past century, thousands of acres of marsh have converted to open water due to destruction from invasive species and relative sea level rise. By 2100, most of the refuge is projected to be permanently inundated by water, with significant portions of the rest of the county subject to flooding (Figure 2).

The county already faces significant economic challenges. At just over \$46,000, median household incomes are less than two-thirds of that of the state as a whole.⁷ The county has one of the highest unemployment rates in Maryland (8.5%). By way of comparison, Talbot County, while just north of Dorchester County, has median incomes that are more than a third higher, and unemployment rates that are 2.9 percentage points lower.

We started the baseline survey by asking respondents about their attachment to their own communities and Blackwater National Wildlife Refuge, and about their social and ecological

Figure 2. Changes to Dorchester County anticipated by 2100



This time series from 2010 to 2100 demonstrates the progressive permanent flooding (blue) of Blackwater National Wildlife Refuge (cross-hatched area) and surrounding areas of Dorchester County, as well as priority regions of critical bird habitat (red), and new potential habitat (pink).⁸

⁶ Lerner, J.A., Curson, D.R., Whitbeck, M. and Meyers, E.J. 2013. *Blackwater 2100: A strategy for salt marsh persistence in an era of climate change*. The Conservation Fund (Arlington, VA) and Audubon MD-DC (Baltimore, MD).

⁷ U.S. Census Bureau. 2015, Apr. 22. *QuickFacts, Dorchester County, Maryland*. Available at <http://quickfacts.census.gov/qfd/states/24/24019.html>

⁸ Lerner, J.A., Curson, D.R., Whitbeck, M. and Meyers, E.J. 2013. *Blackwater 2100: A strategy for salt marsh persistence in an era of climate change*. The Conservation Fund (Arlington, VA) and Audubon MD-DC (Baltimore, MD).

values. Place attachment to natural areas has been linked to environmentally responsible behavior, including communication with others to encourage pro-environmental practices.⁹ Value systems represent another lens through which people selectively process information relating to environmental concern,¹⁰ and which we hypothesize would likely differ across the four audiences.

3.1 Where the four focal audiences live

Most of the baseline survey respondents live in one of the nine counties on the Eastern Shore of Maryland (65%), but these percentages are highly variable across the four focal audiences (Appendix A9). Almost 7 in 10 Audubon members live in other regions of the state (68%), as do 34% of the higher education audience, and 27% of those who say they regularly attend religious services. The business community is most likely to live on the Eastern Shore with only 2% saying they reside elsewhere.

A minority of survey respondents (37%) live in Dorchester or Talbot counties, close to Blackwater National Wildlife Refuge. Just over 1 in 10 of the survey respondents call Dorchester County home (11%). Almost a third of those from the business community (30%) say they live in Dorchester and 19% of those who say they regularly attend religious services. Few affiliated with Audubon or the higher education institutions say they live in the county (respectively, 5% and 3%).

More of the survey's respondents live in Talbot County than Dorchester. Just over a quarter of survey respondents say they reside in Talbot County (27%). Business community members were most likely to say so (54%), followed by faith community members (31%), Audubon members (25%), and those from higher education (9%).

3.2 Community and Blackwater National Wildlife Refuge place attachment

When asked which aspects of their community are most important to them, more than a third (34%) cite an environmental or natural feature (Figure 3; Appendix A10). One in 5 point to the people in their community (20%). Frequently, respondents connect the two. For example, one respondent said: "The environmental and ecological aspects of my community are most important to me, especially the relationships between the environment and people." Recreational activities (17%) and wildlife encounters (18%) are ways that people commonly draw the connection between the environmental aspects of the community and the social elements.

In comparing respondents' place attachment to their town or community versus Blackwater National Wildlife Refuge on a six item scale (Appendix A11-A14), respondents identified as emotionally connected to both, but rated as more attached to

⁹ Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *The Journal of Environmental Education*, 32(4), 16–21.

¹⁰ Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franěk, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology*, 36(4), 457–475.

Figure 3. Most important aspects of community

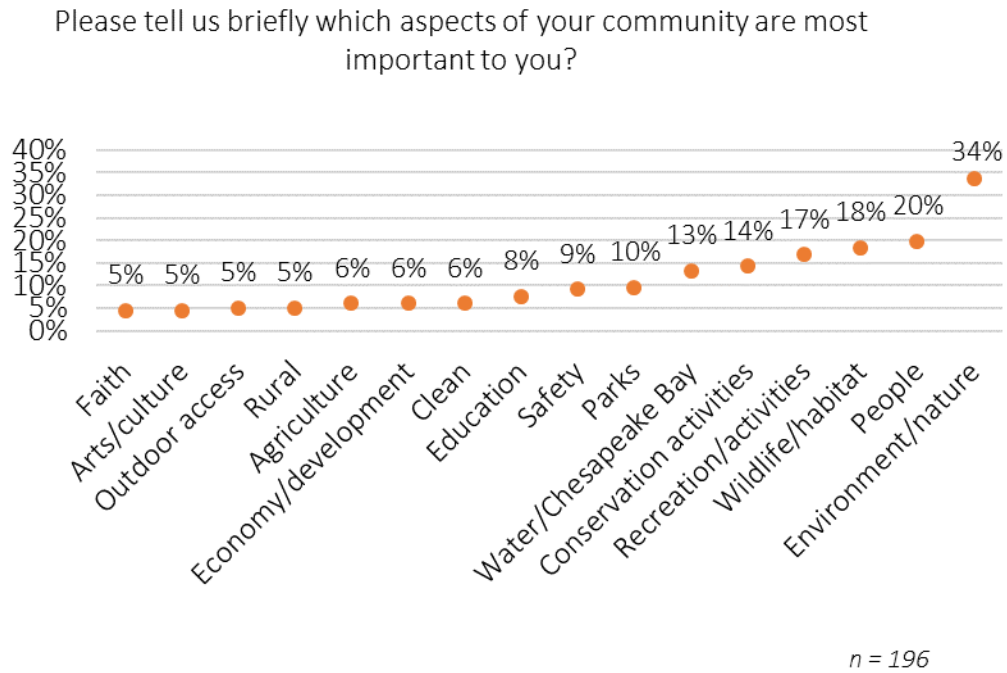
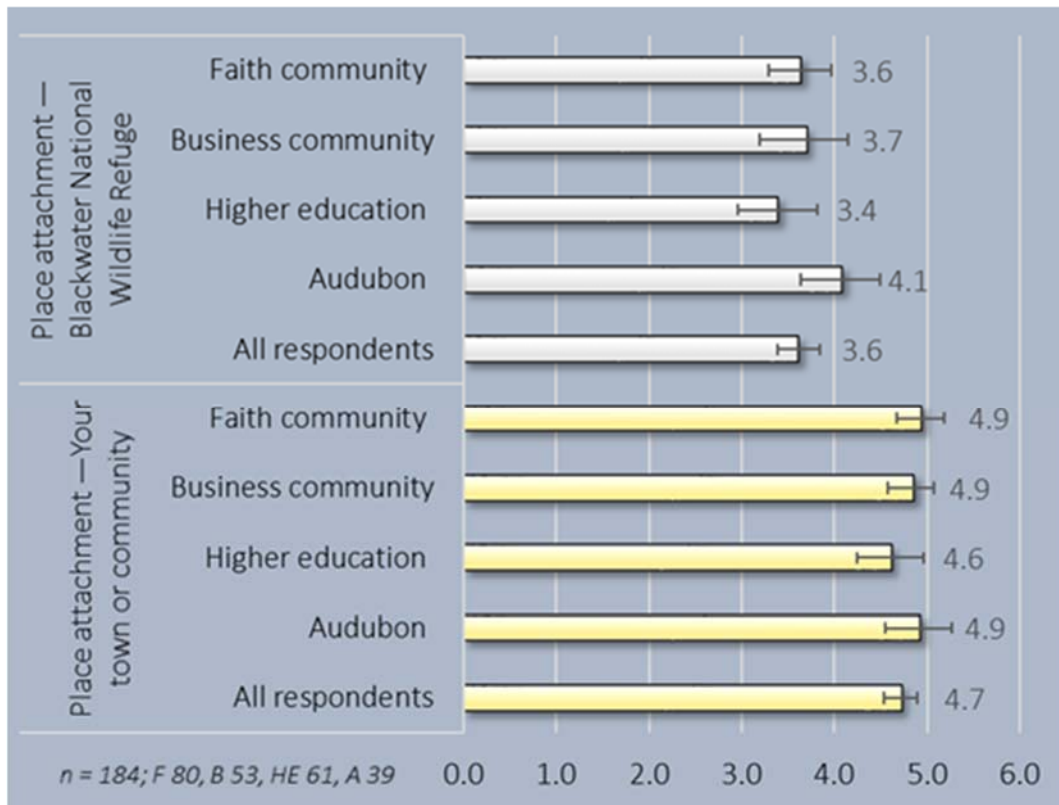


Figure 4. Place attachment to community and the refuge



their own towns or communities than Blackwater National Wildlife refuge. The average for town and community was 4.7 (1-low attachment to 6-high attachment), compared to 3.6 for Blackwater National Wildlife Refuge (Figure 4). Differences between audiences on place attachment were minimal, at most 0.4 of a total of 6.0 possible points.

3.3 Awareness of and visits to Pickering Creek Audubon Center

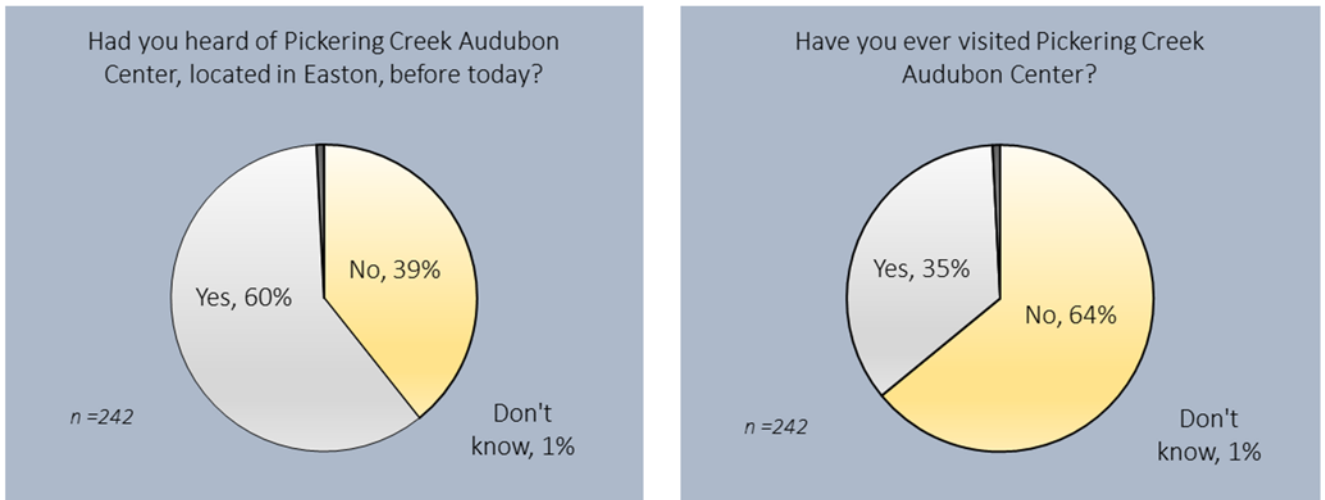
Perhaps unsurprisingly given the importance of the environment and nature to all four audiences, 60% of them said that had heard of Pickering Creek Audubon Center before receiving the survey (Figure 5a; Appendix A15) (Audubon, 89%; higher education, 39%; business community, 74%; faith community, 64%). Yet, only 35% had visited the center (Audubon, 50%; higher education, 13%; business community, 49%; faith community, 36%) (Figure 5b; Appendix A16), and 17% had participated in a program (Appendix A17). At the same time, a small number of the 85 respondents who have visited the Center previously have done so frequently over the years: not just many times in just the past year (13%), but many times in previous years (32%) (Appendix A18).

The Harvest Hoedown (12%) is the most attended programs of six listed on the questionnaire (Bird Walk, 7%; school program, 6%; volunteering/eBird monitoring, 6%; marsh grass restoration days, 4%; salt marsh educational talks, 2%) (Appendix A19). The natural beauty of the site and the knowledgeable staff are listed as highlights of these visits with few suggestions for improvement: among them, remodeling the welcome center and interior spaces for visitors, and holding more adult education events (Appendix A20-A21).

Almost as many people said their children had participated in Pickering Creek Audubon Center's programs as had they—12% (Appendix A22). Children's environmental education has been a priority area for Pickering Creek Audubon Center's programs, and more than 4 in 10 of survey respondents (43%) said they have children (Appendix A23). Almost a quarter of the business community said they had children who participated in these programs (23%) (Audubon, 12%; higher education, 5%; faith community, 16%; Appendix A22).

Of the 27 individuals who said their children had taken part in a Pickering Creek program, again a small core group identified as attending frequently over the past year (18%) and in previous years (33%) (Appendix A24). These visits occurred with their school (11%), but also for the purposes of EcoCamp (4%) and Junior Naturalist Camp (5%) (Appendix A25). The opportunity for children to play outside was the most favored aspect of the programs with few things that respondents thought could be done to improve the programs, except extending them to upper grades (Appendix A26-A27).

Figures 5a-5b. Awareness and visitation of Pickering Creek Audubon Center



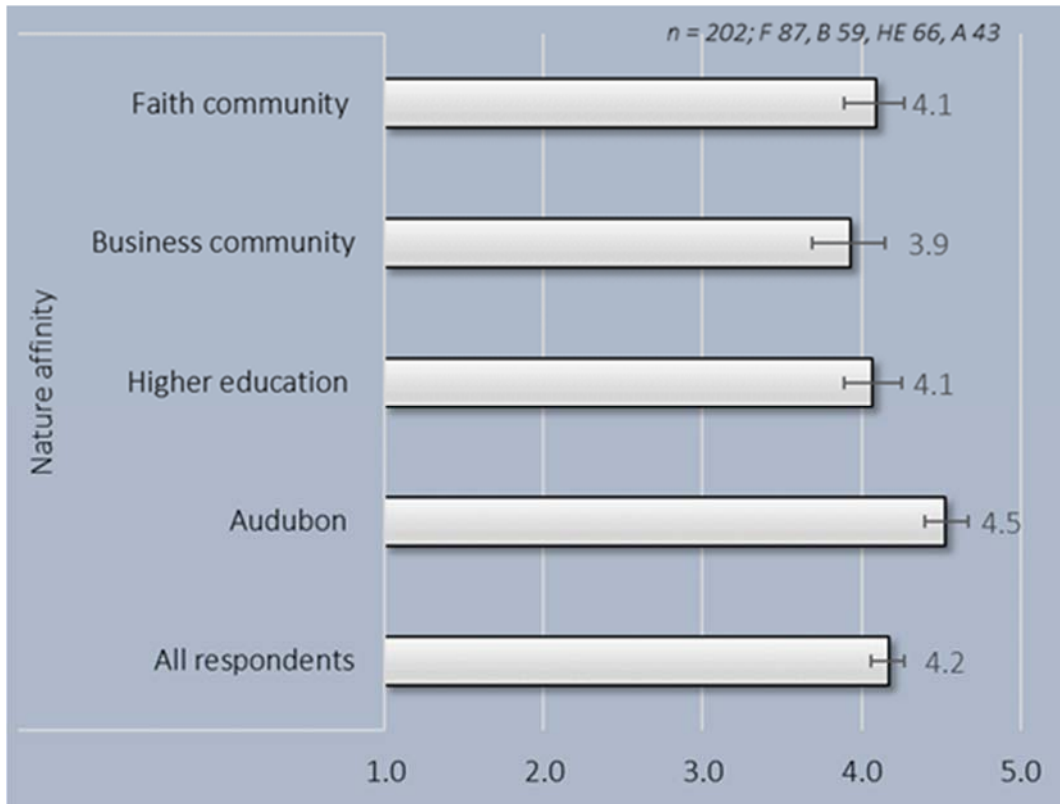
3.4 Affinity for and relatedness to nature

Some authors have cautioned that the United States may be experiencing a decline in appreciation of nature, or biophilia, as a direct result of “videophilia.”¹¹ Relatedness to nature—including enjoyment of being outdoors—is connected to a number of pro-environmental constructs, including concern and behavior, but also well-being.¹² Nature relatedness was measured with six questions. Examples include: “My relationship to nature is an important part of who I am”; “I enjoy digging in the earth and getting dirt on my hands”; and “I enjoy being outdoors, even in unpleasant weather.” Audiences that self-identify with organizations, or educational programs, that focus on the environment might conceivably differ in their affinity for nature from those that do not, requiring separate communication strategies. Instead, all four audiences within this survey score relatively highly on nature relatedness (3.9-4.5 out of 5) (Figure 6; Appendix A28). However, Audubon members rank higher than the other three audiences—business community, faith community, and higher education—on the average of 6 items scaled (1) low to (5) high relatedness.

¹¹ Pergams, O. R. W., & Zaradic, P. A. (2006). Is love of nature in the US becoming love of electronic media? 16-year downtrend in national park visits explained by watching movies, playing video games, internet use, and oil prices. *Journal of Environmental Management*, 80(4), 387–393. ; Pergams, O. R. W., & Zaradic, P. A. (2008). Evidence for a fundamental and pervasive shift away from nature-based recreation. *Proceedings of the National Academy of Sciences*, 105(7), 2295–2300.

¹² Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2008). The nature relatedness scale: Linking individuals’ connection with nature to environmental concern and behavior. *Environment and Behavior*; Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2010). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, 12(2), 303–322.

Figure 6. Nature affinity



3.5 Values (egoistic, altruistic, biospheric)

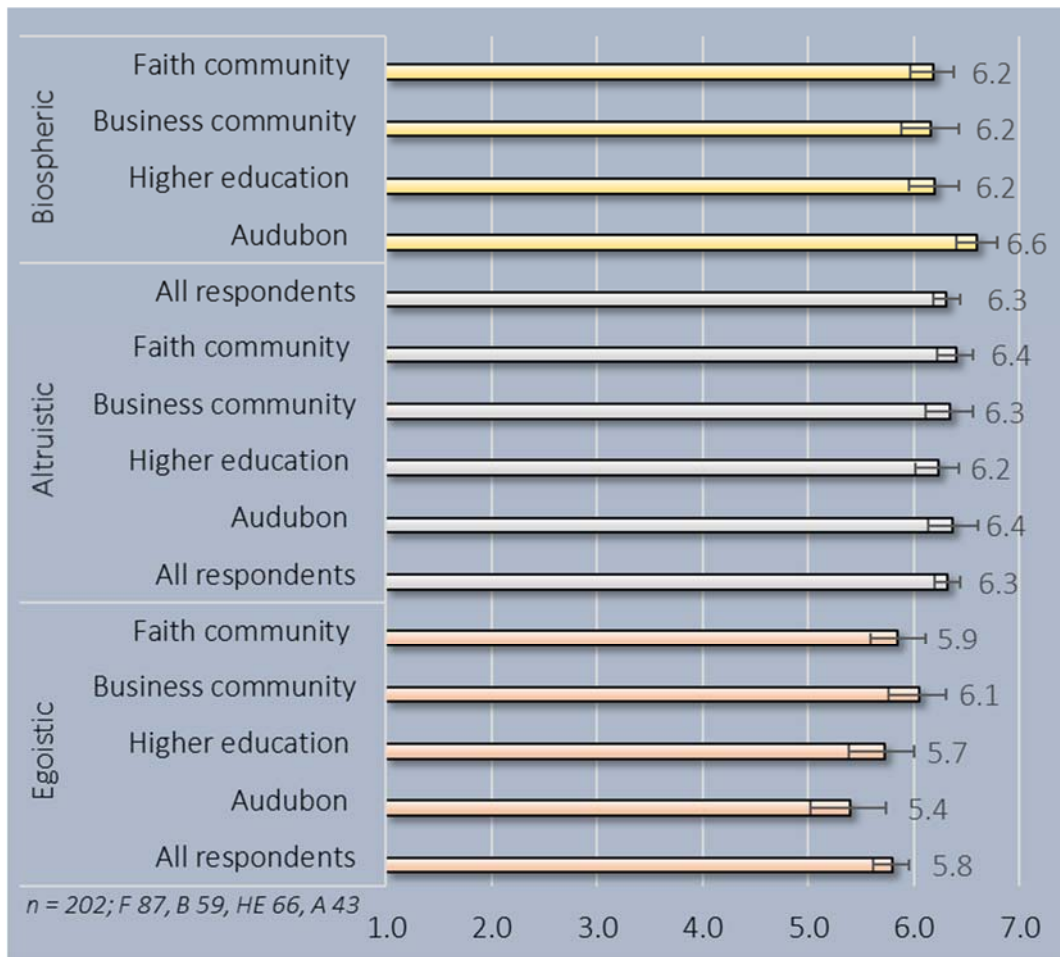
The values we hold underlie our beliefs and attitudes, and serve as the wellspring for our actions.¹³ What we deem most valuable influences how aware we are of environmental consequences of our actions and whether we feel responsible.¹⁴ Those who identify with “egoistic” values—prioritizing environmental problems because of their impacts to themselves, their health, prosperity, lifestyle, and future—are less likely to ascribe environmental consequences to their actions. Conversely, those with biospheric values of concern for trees, marine life, plants, whales, birds and animals are most likely to recognize environmental consequences, take responsibility for their actions, and demonstrate environmental concern. Altruistic values focus on the wellbeing of people in the community, children, humanity, and future generations. They are typically not correlated with environmental concerns.

¹³ Stern, P.C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424.

¹⁴ De Groot, J. I. M., & Steg, L. (2007). Value orientations and environmental beliefs in five countries: Validity of an instrument to measure egoistic, altruistic and biospheric value orientations. *Journal of Cross-Cultural Psychology*, 38(3), 318–332.

On average, all audiences were lowest in egoistic values (Mean $E_{egoistic}$, 5.8), and highest in altruistic and biospheric values (Mean $A_{altruistic}$, 6.3; Mean $B_{biospheric}$, 6.3) (Figure 7; Appendix A29-A31). In comparing individual focal audiences, the business community scored higher on egoistic values than Audubon members; all audiences ranked similarly on altruistic values; and Audubon members attributed themselves as more biospheric than the faith community (by a slim margin). These data suggest there are some, if not large, differences across these audiences in value systems.

Figure 7. Audience values toward people and the natural world



3.6 Salt marshes and sea level rise issue involvement and communication

Salt marshes are tied to the seas by their sharing of saline waters, tidal cycles, and aquatic species. This relationship now puts them at threat from rapidly rising waters due to melting of land-based ice and land subsidence. Restoring wetlands, of which salt marshes are one type, has been a focus of conservation efforts for more than 60 years.¹⁵ Over this period, there has been a shift from valuing wetlands primarily as habitat for wildlife to appreciating the many other ecosystem services that they provide, from water filtration to carbon storage. While this is a more holistic representation of the ecological role of wetlands, it also is more abstract and remains removed from the sociocultural meanings that these areas may hold for people. Indeed, sea level rise may suffer from a similar level of abstraction.¹⁶ Recent studies have demonstrated differences in the meaning ascribed to wetlands based on the level of engagement people have with these ecosystems.¹⁷

In order to capture the emotional and cognitive involvement that people have with the salt marshes and sea level rise, we asked our audiences the extent to which they think about, care about, and believe they are knowledgeable about the salt marshes and sea level rise. We also asked them how frequently they talk about the salt marshes, and hear other people do so.

Across all audiences, people were more likely to say that they care about the salt marshes (extremely, 20%) than that they were knowledgeable about them (extremely, 5%) or that they frequently think about them (extremely, 5%) (Figures 8a-8b; Appendix A32-A34). Fewer than 1 in 10 of any of the four audiences say that they feel extremely knowledgeable about the salt marshes or think about them extremely frequently. Indeed, substantial percentages of those from higher education institutions, and the business and faith community, say that they are not at all knowledgeable or think about the salt marshes (34%/40%, higher education; 33%/44%, business community; 25%/34%, faith community); only 7% of Audubon members say the same.

The issue involvement questions for sea level rise demonstrated a similar pattern. Across all audiences, people were more likely to say that they care about sea level rise (extremely, 19%) than that they were knowledgeable about it (extremely, 3%) or that they frequently think about it (extremely, 4%) (Figure 9; Appendix A35-A37). Members of the business community are most likely to say that they are not at all knowledgeable about sea level rise (38%) and think about it not at all (36%). Only 11% and 5%, respectively, of Audubon members say the same.

¹⁵ Davenport, M. A., Bridges, C. A., Mangun, J. C., Carver, A. D., Williard, K. W. J., & Jones, E. O. (2010). Building local community commitment to wetlands restoration: A case study of the Cache River wetlands in southern Illinois, USA. *Environmental Management*, 45(4), 711-722.

¹⁶ Akerlof, K., Covi, M., & Rohring, E. (in review) Communicating sea level rise. *Oxford Encyclopedia of Climate Change Communication*.

¹⁷ Dobbie, M., & Green, R. (2013). Public perceptions of freshwater wetlands in Victoria, Australia. *Landscape and Urban Planning*, 110, 143-154.

Most people say that they have heard the term salt marsh—only 13% say that they have not—but it does not come up extremely frequently for the majority of Pickering Creek’s audiences (hear about it “extremely” frequently, 14%, faith community; 15%, higher education; 21%, business community; 32%, Audubon) (Appendix A38). Even fewer people frequently discuss the salt marshes (3%), or hear other people talk about them (2%) (Figure 9). There is little variation by audience (Appendix A39-A40). Almost half of higher education, business, and faith audiences never talk about the salt marshes (45%-55%), or hear people they know talk about them (41%-48%). Audubon members are more likely to engage at least slightly in communication on this issue—either talking themselves about it (81%), or hearing others they know talk about it (70%).

Figures 8a-8b. Salt marsh issue involvement and communication

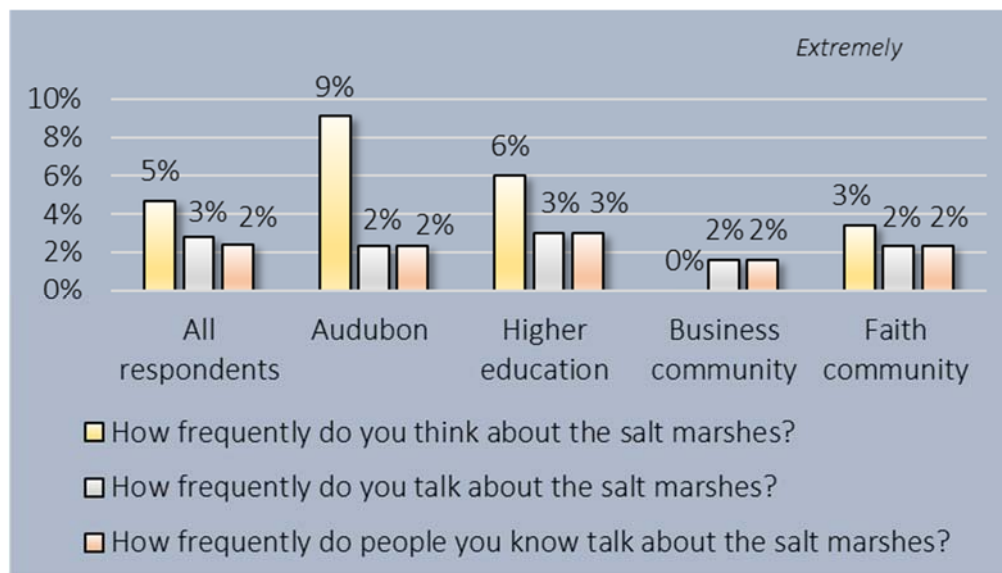
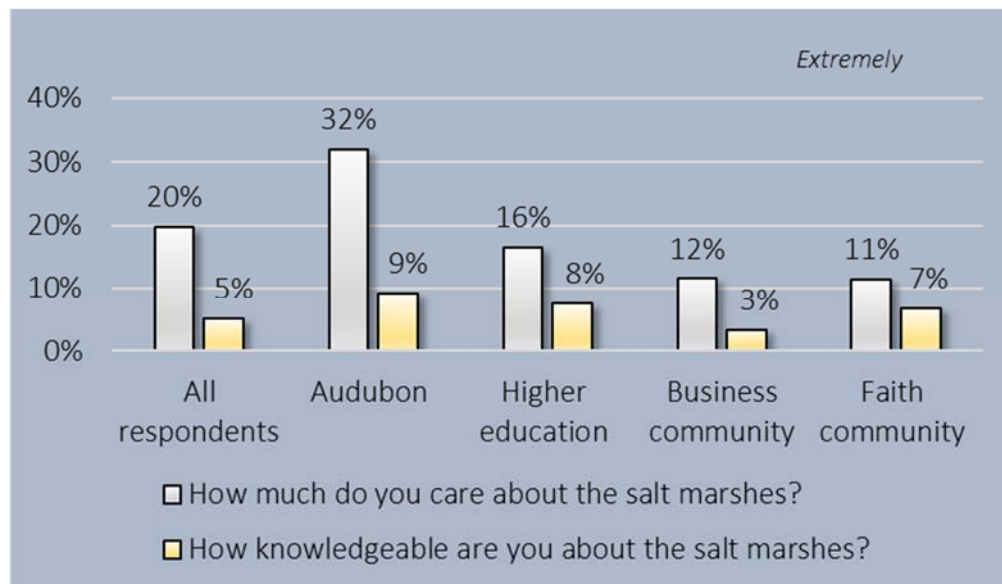
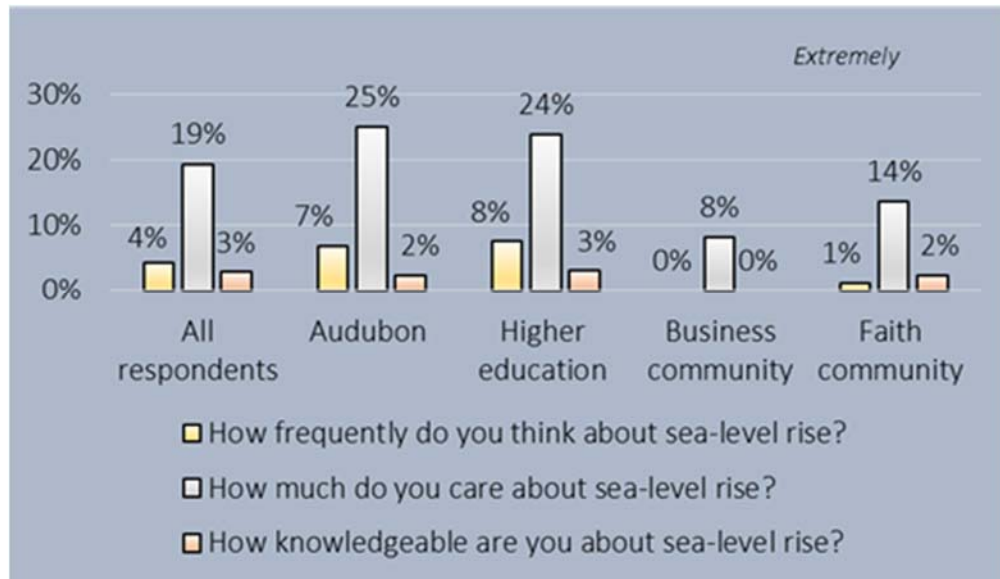


Figure 9. Sea level rise issue involvement

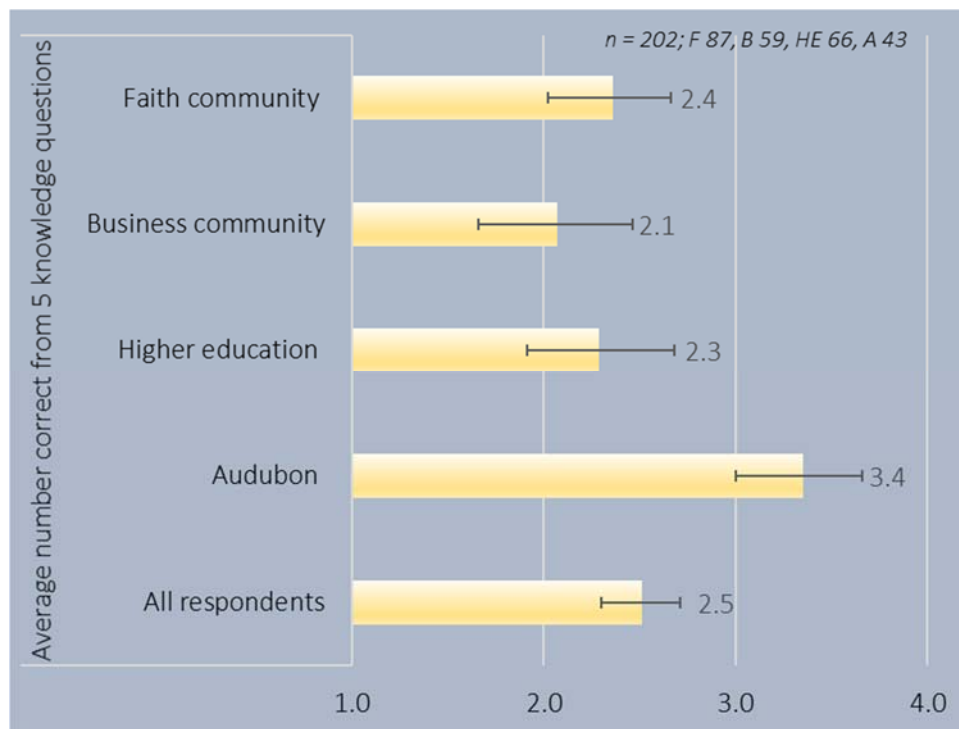


3.7 Salt marsh and sea level rise knowledge

In the previous section, measures of self-reported knowledge on salt marshes and sea level rise were described. In the baseline survey, we also asked respondents five questions about salt marshes and sea level rise to objectively characterize how much information they have on these subjects. The questions ranged from the definition and function of a salt marsh, to threats to the salt marsh, rate of sea level rise, and explanation of the role of the Atlantic Flyway (Appendix A41-A45).

Respondents get half of the questions correct on average (Mean, 2.5) (Figure 10; Appendix A46). Audubon members are most likely to answer all questions correctly (Mean, 3.4). In a series of multiple choice questions, the majority correctly define a salt marsh (66%) and the Atlantic Flyway (72%), and identify one of the functions that the salt marsh does not have (59%). Fewer are able to distinguish the addition of soils as not a threat to the marshes (45%) but as a means of building up the marshes to escape rising waterlines, or the yearly rate of relative sea level rise in Maryland (12%) (Appendix A41-A45).

Figure 10. Average number of correct responses to five knowledge questions



3.8 Sea level rise and climate change certainty and causation

While the majority in the U.S. have said that climate change is happening for decades,¹⁸ less than half strongly hold that belief,¹⁹ including in Maryland.²⁰ Some evidence has suggested that state residents are even less sure about sea level rise.²¹ Attitudes that are held more certainly are less likely to change over time, more likely to influence other attitudes, and are more highly correlated with behavior.²²

We asked respondents first whether they thought climate change was happening, and then how certain they were of that attitude. We asked the same set of questions for sea level

¹⁸ Klima, K. (2016). Public perceptions of global warming: Understanding survey differences. In J. L. Drake, Y. Y. Kontar, J. C. Eichelberger, T. S. Rupp, & K. M. Taylor (Eds.), *Communicating climate-change and natural hazard risk and cultivating resilience* (Vol. 45, pp. 55–63). Springer.

¹⁹ Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2016). *Climate change in the American mind: March, 2016*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

²⁰ Akerlof, K., Winch, P., Parker, C., & Buckland, A. (2015). *Public perceptions of climate change, fall 2015*. Fairfax, VA: Center for Climate Change Communication, George Mason University.

²¹ Akerlof, K. & Maibach, E. W. (2014). *Adapting to climate change & sea level rise: A Maryland statewide survey, fall 2014*. Fairfax, VA: Center for Climate Change Communication, George Mason University.

²² Visser, P., & Holbrook, A. (2012). Metacognitive determinants of attitude strength. In P. Brinol & K. G. DeMarree (Eds.), *Social metacognition* (pp. 21–42). New York and London: Psychology Press.

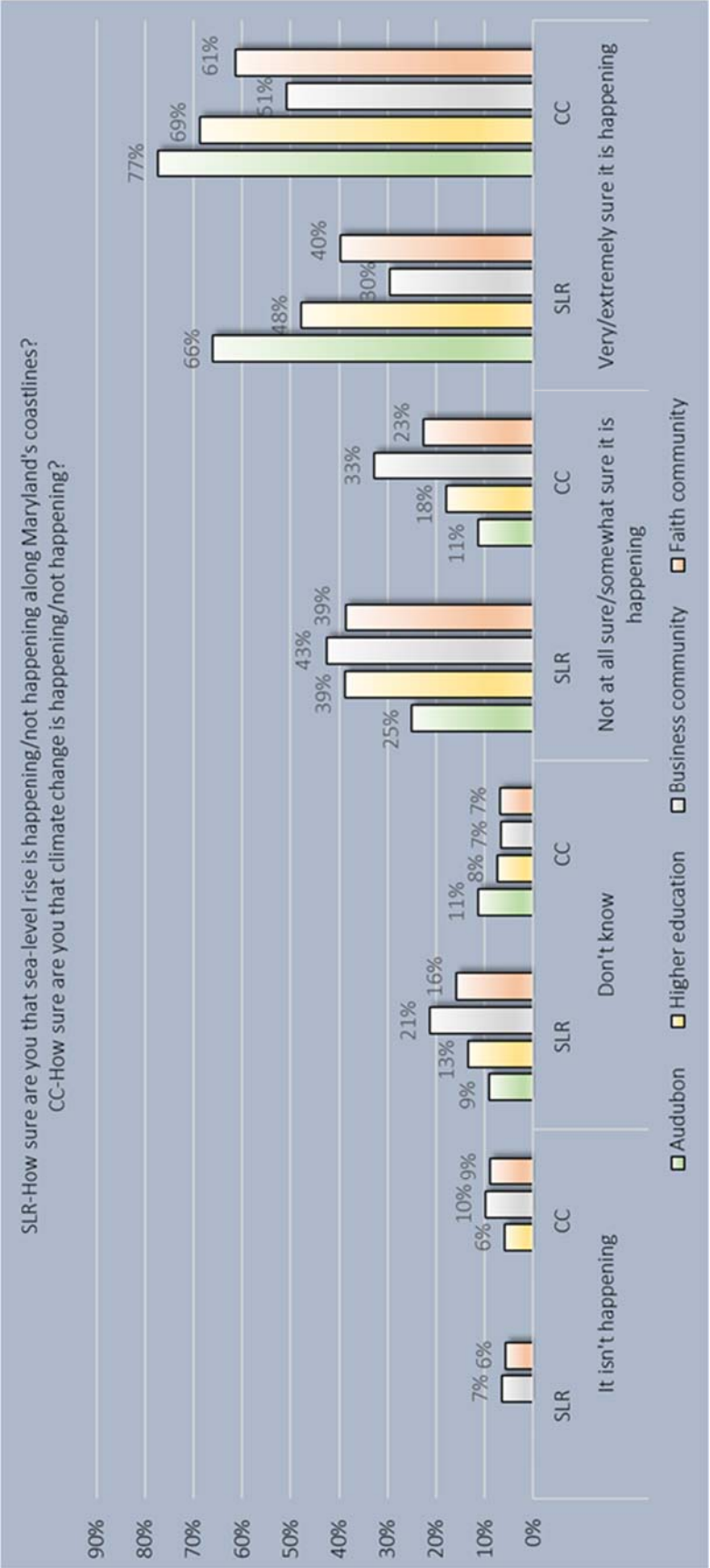


Figure 11. Audience certainty that sea level rise and climate change are happening

rise. While in 2015, only 48% of Marylanders said that they were very or extremely sure that climate change is happening, a full 69% of respondents to this survey say the same (Appendix A47). However, attitudes toward sea level rise are weaker, as expected. Only 48% say that they are very or extremely sure that sea level rise is currently happening along Maryland's coastlines (Appendix A48). While few of any audience say that either climate change or sea level rise are *not* happening (6% CC; 4% SLR), the differences in attitudinal certainty between audiences can be large. Two-thirds of Audubon members are very or extremely sure sea level rise is happening in Maryland, yet only 30% of the business community say the same, a 36 percentage point difference (Figure 11). Variance in attitudinal certainty on climate change is somewhat narrower: more than three-quarters of Audubon members are very or extremely sure of its existence (77%), while only 51% of the business community are, a 26 percentage point split.

The majority of Audubon and higher education audience members say that climate change is mostly or entirely caused by human activities (respectively, 61% and 71%) (Appendix A49). Less than half of the business and faith communities say the same (40% and 46%).

3.9 Perceptions of social and scientific consensus

One of the factors that influences attitudinal certainty is the degree to which people perceive that others share the same belief.²³ Indeed, communication about the scientific consensus on climate change has become a widely adopted messaging strategy based on a considerable body of social science research.²⁴ What has been less clear is the role that social consensus may also play in influencing attitudinal certainty. Just as media accounts of climate change science have long emphasized disagreement between scientists, as opposed to areas of consensus, political reporting has focused on the issue's societal polarization. Preliminary results from surveys in Maryland suggest that perceptions of social consensus on climate change play a similar role in influencing attitudinal certainty and follow-on beliefs as does the scientific consensus.

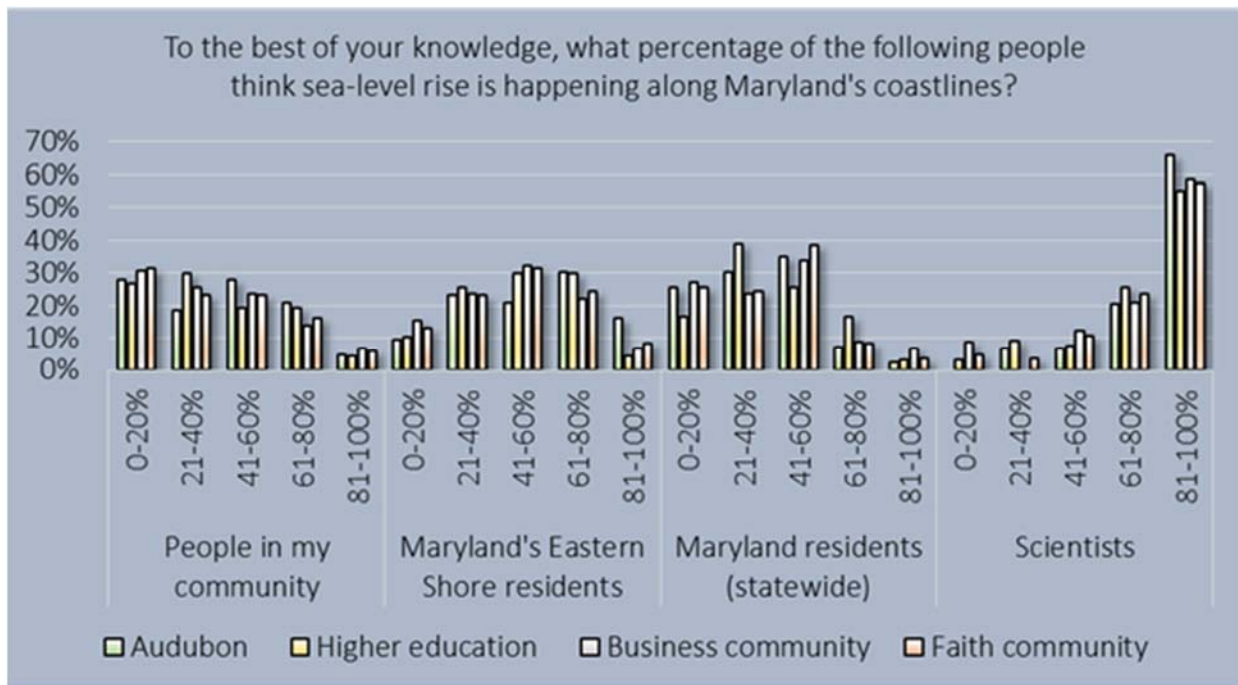
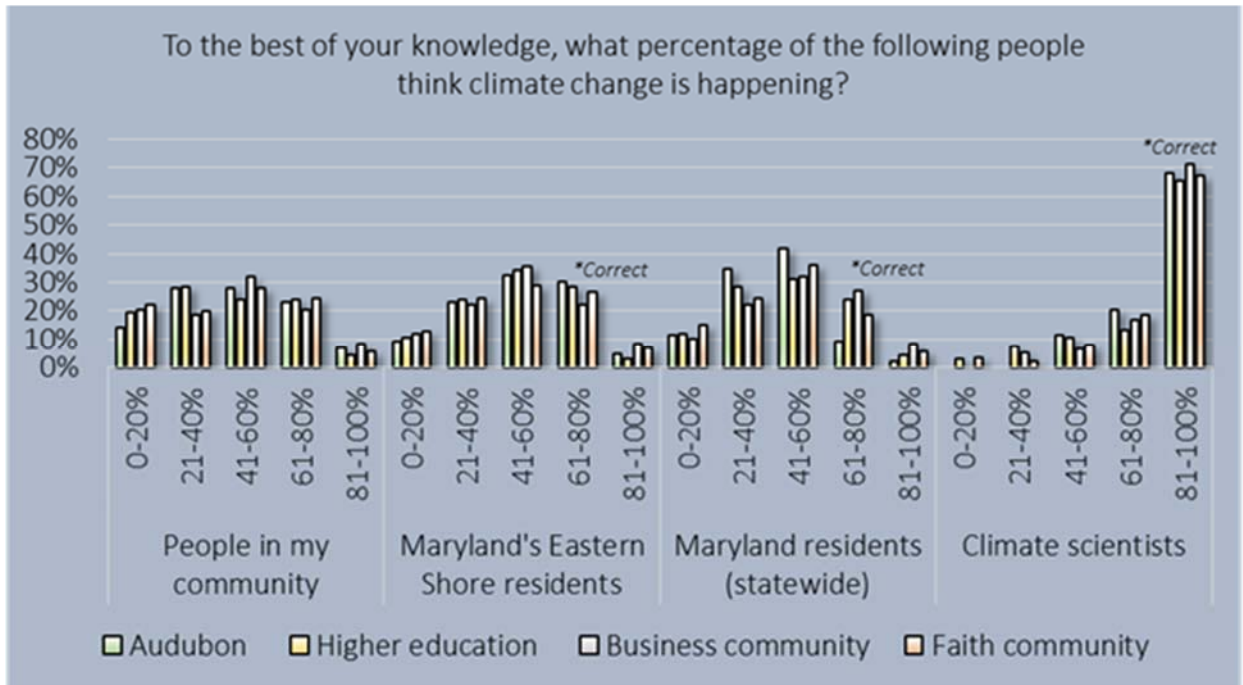
Survey respondents were asked to estimate the percentage range of people in their community, region, and state who thought that sea level rise is happening, and the percentage of scientists. They were then asked the same set of questions, but for climate change. As seen in the state of Maryland as a whole,²⁵ people were much more likely to underestimate the social consensus on climate change than the scientific consensus—70% correctly peg the scientific consensus as over 80%, while only 24% say that between 60%-80% of the state's residents say that climate change is happening (Figure 12a; Appendix A50). On sea level rise, again a majority—61%—say that more than 80% of scientists think it is happening off Maryland's coastlines, but most say that 40% or less of people in their community and the state agree with them (51% in both cases) (Figure 12b; Appendix A51). There are few differences between the four audiences of these perceptions.

²³ Visser, P., & Holbrook, A. (2012).

²⁴ van der Linden, S., Leiserowitz, A., Feinberg, G., & Maibach, E. (2015). The scientific consensus on climate change as a gateway belief: Experimental evidence. *PLoS ONE*, *10*(2), 1–8.

²⁵ Akerlof, K., Winch, P., Parker, C., & Buckland, A. (2015).

Figures 12a-12b. Perceptions of social and scientific consensus on climate and sea levels



4. Civic and communication opinion leadership

Using opinion leadership constructs defined by Rogers and Roper ASW,²⁶ we identified a subset of conservation communication opinion leaders, civic leaders (termed influentials), and combined civic and conservation communication leaders within the four audiences. Decades of research on both opinion leaders and influentials suggest that these populations should be different from other Americans in their demographic characteristics, values, social interactions, media consumption and political behavior, reflecting their pivotal role in affecting societal change.²⁷

Five questions formed the basis for the measurement of conservation communication opinion leadership. The items were summed with a maximum of 24 possible points, representing the highest possible score for opinion leadership. The questions ask how much people talk—and give advice and information—about “protecting our region’s natural areas and wildlife,” and how many people they have reached over the past 6 months.

On average, people scored 14.2 points out of the possible 24 on conservation communication opinion leadership, with those from higher education institutions ranking the highest (Mean, 15.1) and the business community the lowest (Mean, 12.9) (Figure 13; Appendix A52).

Civic leaders—or influentials—are determined by counting how many of 11 political or civic engagement activities they have done over the past year, including membership in a group that lobbies for public policy change, attending a rally or meeting, contacting an elected official, and serving as an officer or leader in a local organization. Those individuals who have accomplished 3 of 11 actions in the past year qualify as an influential, or civic leader as we will call them here.

Perhaps surprisingly, the majority (57%) of respondents qualify as a civic leader, including all but one of the audiences (54%, Audubon; 72%, higher education; 58%, faith community) (Figure 14; Appendix A53). Less than half of the business community say they have conducted 3 civic actions in the last year (41%).

²⁶ Rogers, E. M. (2010). *Diffusion of innovations, 4th Ed.* Simon and Schuster.; Keller, E., & Berry, J. (2003). *The Influentials: One American in ten tells the other nine how to vote, where to eat, and what to buy.* Simon and Schuster.

²⁷ Nisbet, M. C., & Kotcher, J. E. (2009).

Figure 13. Conservation communication leadership

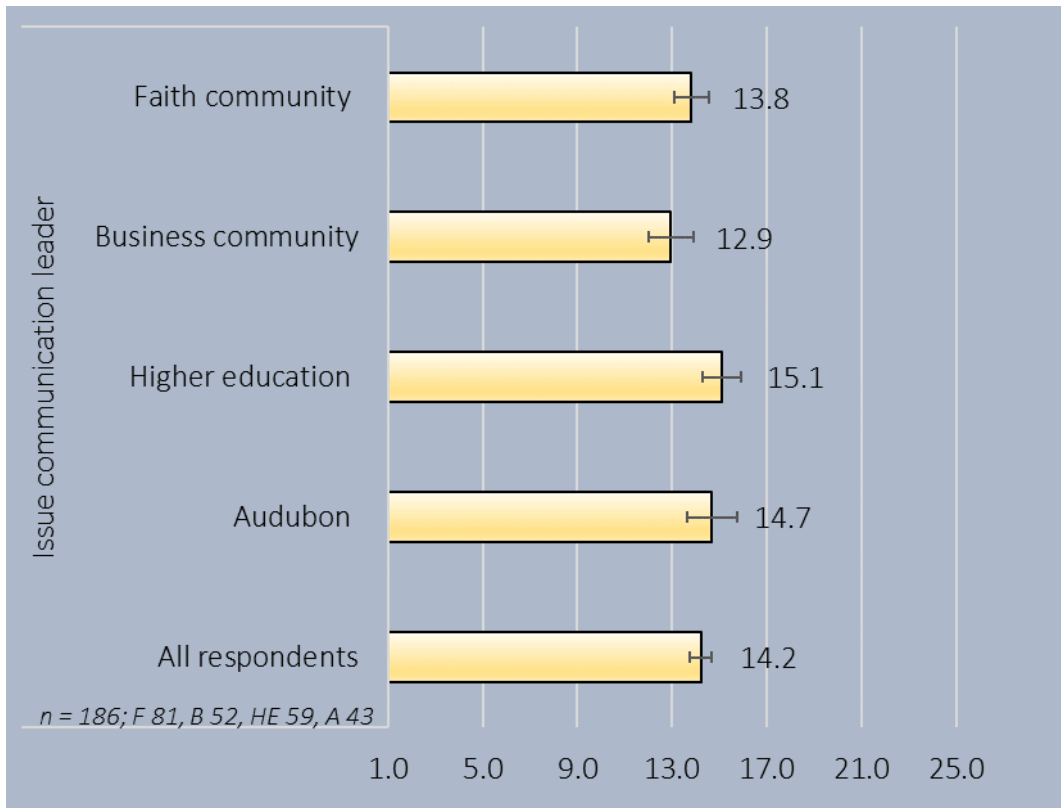
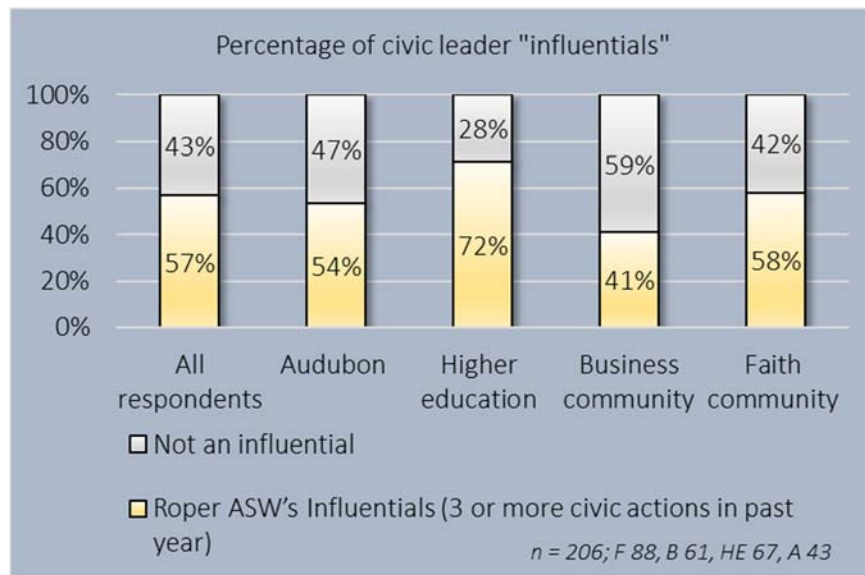
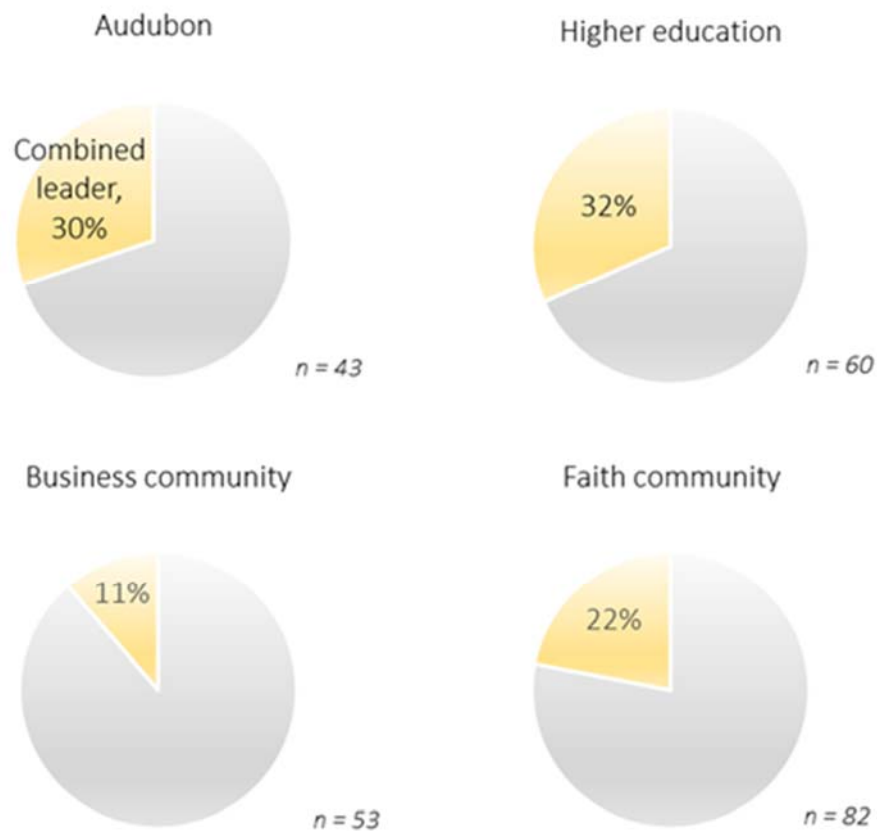


Figure 14. Civic leader influentials



By crossing each group of opinion leaders²⁸—those at the top 25% of the communication scale and the civically-minded influentials—a smaller, yet still sizeable group remains within each of the audience who self-report as both being highly communicative within their social network and politically active (Figure 15; Appendix A55). Almost a third of Audubon and higher education audiences fall into this category (Audubon, 30%; higher education, 32%). Approximately 1-2 in each 10 people from the business and faith communities also qualify (business, 11%; faith, 22%). We would anticipate that this group’s combined leadership qualities would make them the most well-placed and skilled in affecting social change.

Figure 15. Combined civic and conservation communication opinion leaders



²⁸ An idea that originated with E. W. Maibach at George Mason’s Center for Climate Change Communication for analysis of climate change opinion leaders.

5. Factors for opinion leadership and issue involvement

The first part of this report has enumerated a series of audience characteristics which social scientists believe to be important for pro-environmental behaviors, including communication. In choosing the most important targets for the purposes of limited outreach dollars and time, we can model how individual variables may affect the outcomes of interest—generating public issue involvement in the salt marshes and sea level rise, and promoting civic and conservation communication leadership—while holding other factors constant.

For example, attitudinal consensus perceptions are correlated with three outcomes that are of strategic communication interest: conservation communication leadership, and sea level rise and salt marsh involvement (Table 2). Sea level rise involvement—an aggregate scale variable measuring self-reported knowledge, frequency of thought, and caring—is highly correlated with measures of perceived social and scientific consensus on both sea level rise and climate change. When measures of community and scientific consensus on sea level rise are included in a full model predicting sea level rise involvement (Table 3), only perceptions of sea level rise community consensus remain a significant predictor. This suggests it may be a more productive belief target in designing outreach programs.

Table 2. Relationship between perceived consensus and issue leadership and involvement

		Civic and conservation communication leadership	Conservation communication leadership	Sea level rise involvement	Salt marsh involvement
Sea level rise perceived consensus	People in my community		.176*	.305**	
	Maryland's Eastern Shore residents			.327**	
	Maryland residents (statewide)		.162*	.291**	
	Scientists		.175*	.333**	.196**
Climate change perceived consensus	People in my community			.202**	
	Maryland's Eastern Shore residents			.196**	
	Maryland residents (statewide)			.144*	
	Climate scientists		.157*	.322**	.158*

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Place attachment to Blackwater National Wildlife Refuge is one of the strongest factors related to all four outcome variables of interest (Table 3). It significantly predicts civic and conservation communication leadership, conservation communication leadership, and salt marsh issue involvement. Affinity for nature (or relatedness) is the next most frequent significant predictor, connected to both salt marsh and sea level rise issue involvement. Older age and biospheric values also contribute to salt marsh issue involvement. Audubon affiliation, not being associated with a higher education institution, and perceived community sea level rise consensus contribute to issue involvement on the topic.

Table 3. Important factors for issue leadership and involvement

Standardized model coefficients of predictors

	Civic and conservation communication leadership	Conservation communication leadership	Salt marsh issue involvement	Sea level rise issue involvement
Age	--	--	0.43	--
Male	--	--	--	--
Education	--	--	--	--
Income	--	--	--	--
Conservatism-Liberalism	--	--	--	--
Faith community	--	--	--	--
Audubon member	--	--	--	0.16
Higher education	--	--	--	-0.18
Business community	--	--	--	--
Place attachment— town or community	--	--	--	--
Place attachment— Blackwater National Wildlife Refuge	0.60	0.25	0.18	--
Affinity for nature	--	--	0.23	0.19
Biospheric values	--	--	0.17	--
Sea level rise certainty	--	--	--	--
Climate change certainty	--	--	--	--
Perceived community consensus on sea level rise	--	--	--	0.16
Perceived scientific consensus on sea level rise	--	--	--	--
Variance explained by model	26%	22%	33%	44%

6. Summary of audience characteristics

The results from the first part of this research study can be divided into two groups of conclusions: 1) about the sample as a whole; and 2) specifically about the four focal audiences.

General findings

- The salt marshes are not a salient issue for most people. A majority say that they have heard the term “salt marsh”—only 13% say that they have not—but it does not come up extremely frequently for most of Pickering Creek’s audiences (20%). Even fewer people frequently discuss the salt marshes (3%), or hear other people talk about them (2%).
- More than two-thirds of respondents are very or extremely sure climate change is happening (69%). Attitudes toward sea level rise are more uncertain; only 48% say that they are very or extremely sure that sea level rise is currently happening along Maryland’s coastlines
- Respondents are more likely to underestimate the social consensus on climate change than the scientific consensus—70% correctly peg the scientific consensus as over 80%, while only 24% correctly say that between 60%-80% of the state’s residents believe that climate change is happening. On sea level rise, again a majority—61%—say that more than 80% of scientists think it is happening off Maryland’s coastlines, but just over half (51%) say that 40% or less of people in their community and the state agree with them.
- All four audiences have individuals who rank highly on conservation communication and civic leadership.
- Among this sample, place attachment to Blackwater National Wildlife Refuge is one of the strongest factors related to issue involvement and opinion leadership. It significantly predicts civic and conservation communication leadership, conservation communication leadership, and salt marsh issue involvement. Affinity for nature is the next most frequent significant predictor.

Audience specific findings

- Audubon members are unique in a number of characteristics: 1) most do not live on the Eastern Shore; 2) they rank higher than the other three audiences—business community, faith community, and higher education—on nature relatedness; 3) their values are more “biospheric”; 4) they are more knowledgeable about salt marshes and sea level rise; and 5) they are more certain that sea level rise is happening off of Maryland’s shores.
- Substantial percentages of those from higher education institutions, and the business and faith community, say that they are not at all knowledgeable or think about the salt marshes (34%/40%, higher education; 33%/44%, business community; 25%/34%, faith community).
- Almost half of higher education, business, and faith audiences never talk about the salt marshes (45%-55%), or hear people they know talk about them (41%-48%).

- Members of the business community are most likely to say that they are not at all knowledgeable about sea level rise (38%) or think about it not at all (36%). Only 30% say they are very or extremely sure sea level rise is happening.
- Conservation communication leadership is the highest among those from higher education institutions and lowest among the business community.

While acknowledging the higher representation of women and more highly educated audiences who lean liberal among the survey respondents, for the purposes of informing Pickering Creek's outreach, this sample represents those organizations and individuals who are most likely to respond with fairly high levels of recruitment effort. Individuals who are not likely to be persuaded to participate are inherently of lesser interest to the Center.

7. Audiences: Conclusion and recommendations

As highly connected to nature and as active as opinion leaders as these baseline survey respondents are, the salt marshes are still a relatively esoteric topic that does not often come up in their conversations. Sea level rise is similarly non-salient; less than half are very or extremely sure it is happening off Maryland's coastlines. In contrast, two-thirds of the audience are very or extremely certain of climate change.

Climate change communication is reaching a new stage, particularly among informed audiences such as these, where the discussion is about specific localized phenomena and their ramifications across an ecosystem, including its human communities, instead of the traditional messages of climate change communication (it's happening; humans are the cause; it's harmful; we can do something). What may be surprising to many is that sea level rise—which has been discussed as one of the effects of climate change for decades—is not as familiar to audiences. Of the four focal audiences—Audubon members, higher education, and the business and faith communities—the ones who are most at risk from sea level rise are those who are proximate to low-lying coastal lands, including near Blackwater NWR. These are the business and faith communities. The primary economic sectors for Dorchester County are manufacturing, services, tourism, and agriculture/aquaculture.²⁹ A number of these sectors will likely be affected by sea level rise. Startlingly, the business community in Dorchester and Talbot counties is the least likely of the four audiences to be aware of sea level rise, or even convinced that it is an issue with local relevance.

The environmental education model that Pickering Creek Audubon Center has developed addresses these localized effects of climate change: the loss and migration of the salt marshes due to sea level rise. Moreover, it combines outdoor experiences with ecological learning opportunities. Some communities are choosing, however, to encourage public participation in decision-making about wetland restoration as an alternate or parallel model.³⁰

The sizeable percentages of opinion leaders—both for civic engagement and conservation communication—within these audiences present nascent possibilities for grassroots mobilization. If that is a direction that Pickering Creek chooses to take, however, there are significant practical challenges in marshaling the current four focal audiences, such as the limited proximity of the most knowledgeable and involved audience—Audubon—to the refuge and its surrounding communities. Regardless of the Center's decision, these analyses demonstrate the importance of engendering place attachment to Blackwater NWR, a core aspect of Pickering Creek's program. Feeling of connectedness with the refuge are related both to salt marsh issue involvement and to civic and conservation communication opinion leadership.

²⁹ Maryland Dept. of Business and Economic Development. ND. *Brief economic facts: Dorchester County, Maryland*. Available at <http://business.maryland.gov/Documents/ResearchDocument/DorchesterBef.pdf>

³⁰ Davenport, M. A., et al. (2010).

This analysis leads to the following recommendations to increase attention and involvement of the community in the marshes and sea levels:

- Increase the frequency of communication on sea level rise and its local effects, especially on the salt marshes.
- Look for additional opportunities to promote feelings of community connectedness to the salt marshes and pride (see box below).
- The voices of scientists matter, but so do those of community members. Provide opportunities during all types of adult outreach for people to hear from each other so that they realize they share areas of common concern. Media stories that interview members of the community can also accomplish the same goal.
- Consider a decision-making engagement model that would recruit members of the local community to partner with governmental and non-profit organizations pursuing salt marsh restoration and migration planning.
- Reconsider the selection of audiences based on a re-evaluation of the program's goals, this study, and other factors.



- Consider adopting RARE's "pride campaign" model to feature a refuge species, such as a marsh bird, as a community mascot.³¹
- Increase social media, email listserv, and other communication and outreach content on the salt marshes and sea level rise to raise the frequency that the focal audiences hear and think about them.
- Connect with local newspapers and radio stations and encourage them to assign a reporter to regularly cover the refuge, salt marshes, and sea level rise, and the impacts of changes on local communities. Provide them with a list of people who can serve as contacts.
- Leverage interest in regional outdoor activities by partnering with other organizations to create sports events, such as half-marathons or triathlons that are based in the refuge, draw tourists, augment the local economy, and increase local pride.
- Partner with outdoor outfitters or other organizations to offer summer children's camps in the refuge.
- Partner with cultural organizations to sponsor salt marsh art and photography contests, themed theater plays, historical exhibits, specialty food events, or concerts.

³¹ Jenks, B., Vaughan, P. W., & Butler, P. J. (2010). The evolution of Rare Pride: Using evaluation to drive adaptive management in a biodiversity conservation organization. *Evaluation and Program Planning*, 33(2), 186-190.

8. Characterizing participant experiences at Blackwater NWR

In 2015 and 2016, four Eastern Shore colleges and universities sent students to participate in Blackwater National Wildlife Refuge marsh trips. Audubon members and affiliated volunteers rounded out the list. Pickering Creek Audubon Center makes the daylong experiential events both hands-on and highly interactive, drawing on all of the senses. In advertising the trip, they tell potential attendees:

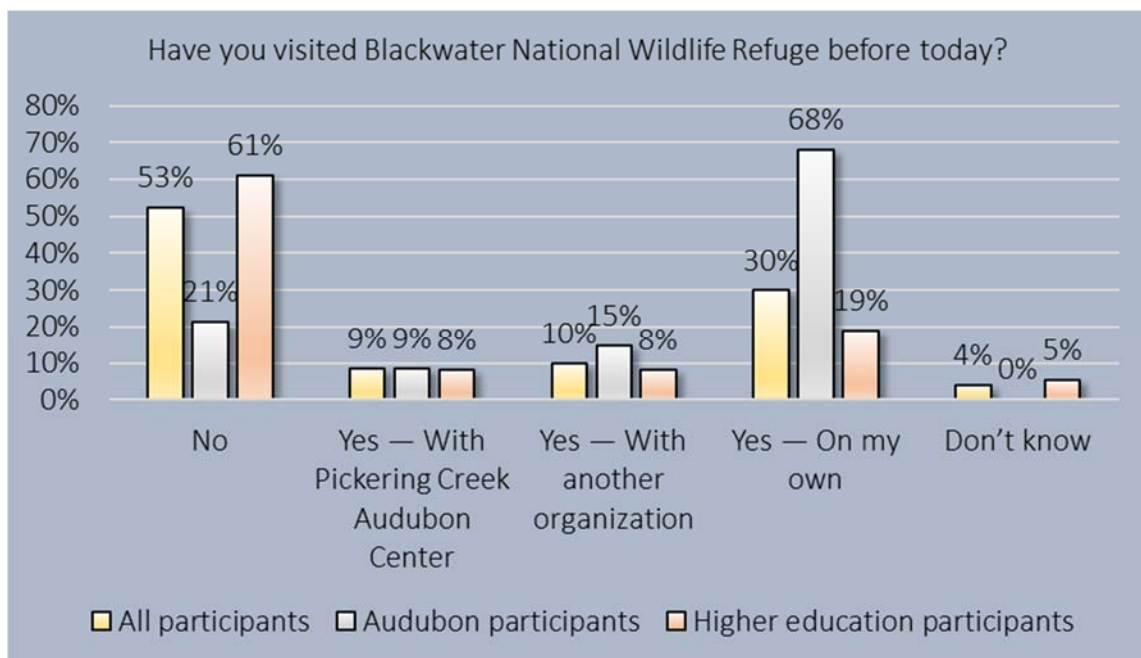
- Experience the sights, smells, and sounds of the marsh firsthand,
- Observe birds from eagles to ducks to sparrows,
- See connections between the soil, plants and animals of the salt marsh.

Accordingly, in this second portion of the study we look for indicators not just of engagement with the natural environment and ecological learning, but of emotional involvement and group bonding. In particular, we seek to identify types of experiences that increase the likelihood of participants' communication about the salt marshes and sea level rise, and even Pickering Creek's program itself. The two focal audiences for the programs are higher education and Audubon. A few of the 221 were unaffiliated (4), and are represented under "all participants."

8.1 Familiarity with Blackwater NWR

For most higher education participants, the trip to Blackwater NWR is a new experience. About 6 in 10 say they have not previously visited the refuge (Figure 16; Appendix B3). For Audubon members and affiliates, the reverse is true. More than 6 in 10 say they have been there on their own, with another 1 in 10 saying they have gone with Pickering Creek (9%),

Figure 16. Prior familiarity with the refuge



and 1 in 10 saying it was with another organization (15%). (*Respondents could select multiple categories; totals may not add up to 100%.*)

8.2 Group cohesion

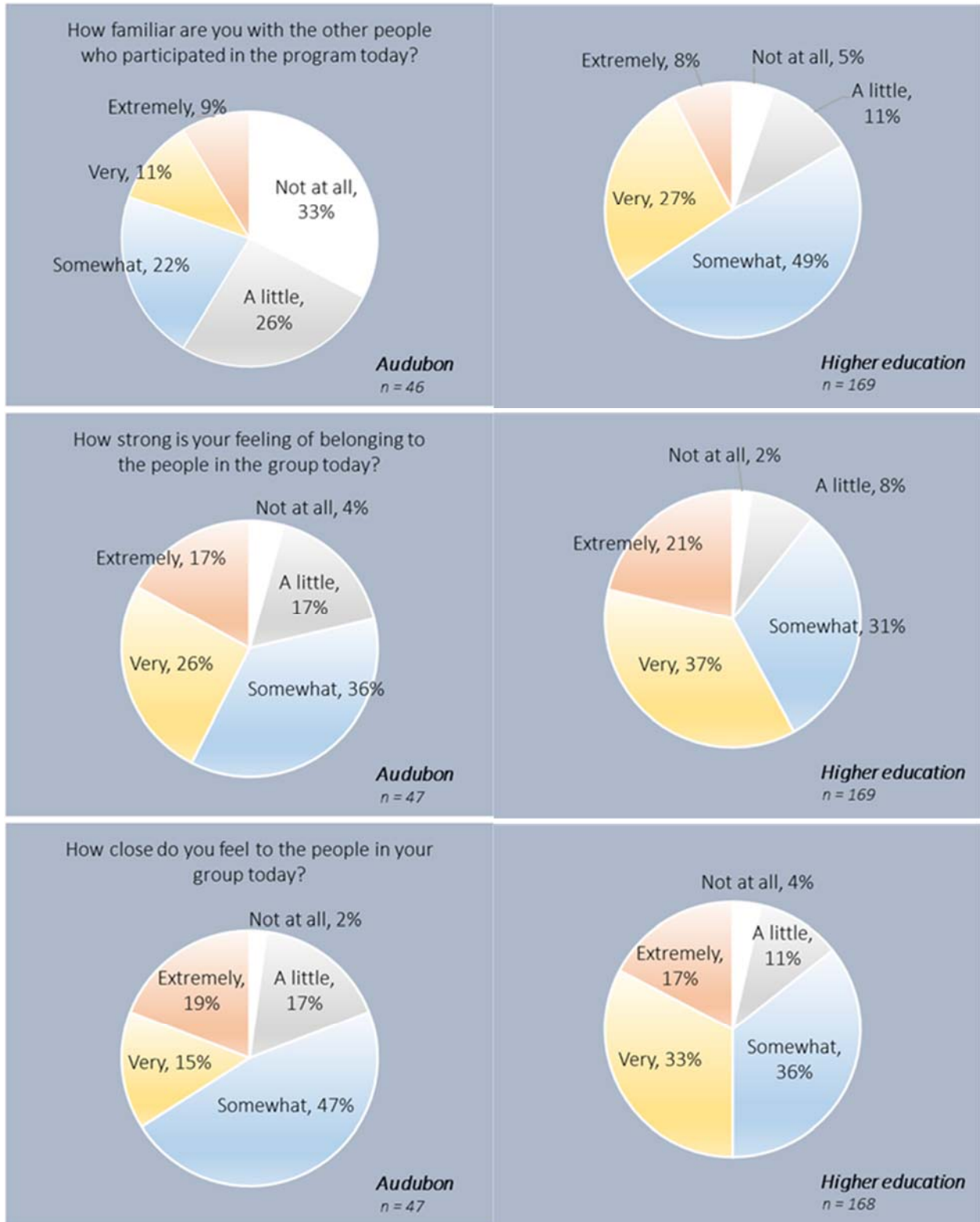
People who take the trip to Blackwater NWR may go for the salt marsh and its wildlife, but the species with which they will interact the most is other human beings: other participants and staff. These group dynamics can promote conservation in two ways: 1) by strengthening individual attitudes and influencing behaviors through social norms; and 2) establishing social motivations for cooperation. As discussed in the previous section on social consensus, when individuals perceive that others with whom they identify are of like mind, the strength and durability of those shared attitudes within the group increases,³² along with concomitant behaviors. Social motivation may be particularly important for pro-environmental behaviors, which are often associated with little private gain by individuals, but great benefits for the social groups to which they belong. Some authors suggest that programs that promote voluntary cooperation with groups based on social motivations may be more effective than those that focus on individual short-term interest.³³

Three questions in the survey assess group cohesion—how familiar respondents are with others in the group, and feelings of closeness and belonging. Most participants say they are familiar with others in their group—only 12% are not—and they feel they belong to the group (55%), though they do not necessarily feel particularly close to them (not at all-somewhat, 53%) (Figures 17a-17c; Appendix B4-B6). Most of the higher education participants attend as part of a course or program. As a result, they are much more likely to be familiar with others in their group—only 5% say they are not, as opposed to 33% of Audubon members. More than half of them feel a very or extremely strong sense of belonging to the group (58%), as opposed to just under half for Audubon (43%). Half of the students and faculty feel very or extremely close to other group members (50%), whereas 34% of Audubon members do.

³² Sunstein, C. R. (2000). Deliberative trouble? Why groups go to extremes. *The Yale Law Journal*, 110(1), 71–119.

³³ Tyler, T., & Rankin, L. (2012). The mystique of instrumentalism. In J. Hanson (Ed.), *Ideology, psychology, and law* (pp. 537–573). Oxford University Press.

Figures 17a-17c. Feelings of group connection during program experience



9. Participant satisfaction with program content and staff

Most of the organizations that encourage their students and members to participate in Pickering Creek Audubon Center’s Blackwater NWR trip have done so for multiple years. This indicates the perceived value of the program to its partner organizations. We sought to further characterize how individual participants feel about the program overall, its content, staff responsiveness, and whether they would recommend the trip to others. For each of these areas we asked a set of three questions, followed by an open-ended question on what participants would tell a friend about their experience that day. Their responses were coded into categories.

All four areas—program overall satisfaction, content, staff responsiveness, and worthiness of recommendation—are highly rated by participants (Figures 18-21; Appendix B7-B18). Almost all Audubon participants say they were satisfied with the program, its content, and staff, and would recommend it to others (98%-100%, somewhat/strongly agree). A similarly high 88% to 96% of higher education students and faculty say likewise. While both Audubon and higher education participants report favorably on the program, those from colleges and universities are consistently somewhat softer in their support for each of all 12 measures. They are less likely to strongly agree with positive program descriptions by 13 to 25 percent points compared to Audubon members. The largest split is in those who say they would participate in the program again. Almost 9 in 10 of Audubon members say yes (87%), but only 6 in 10 from regional universities and colleges (62%).

Figure 18. Program satisfaction

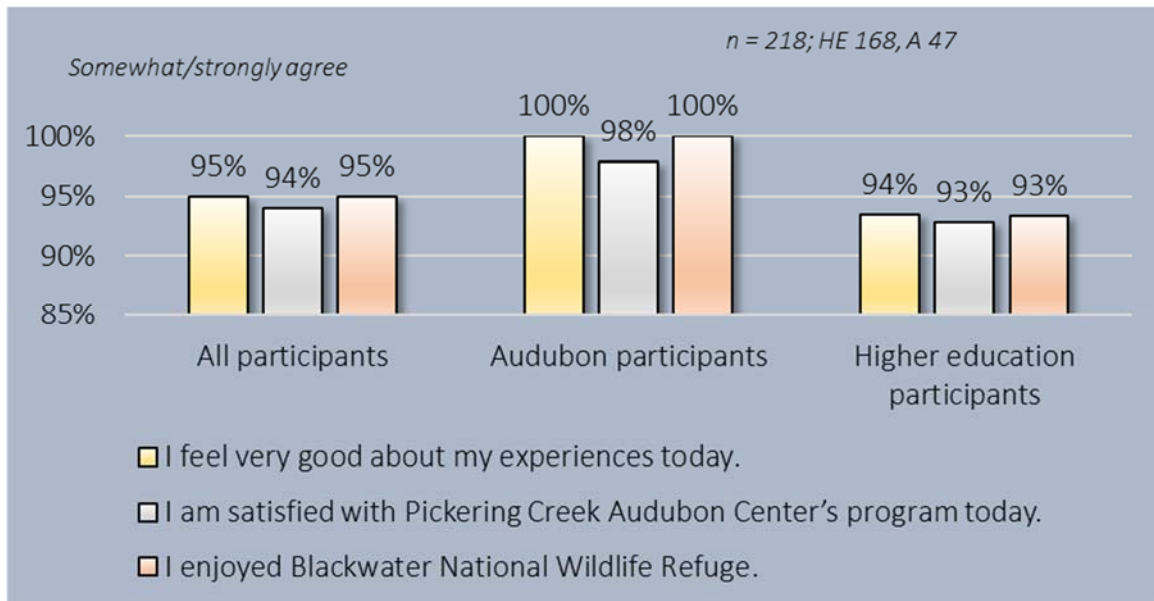


Figure 19. Quality of program content

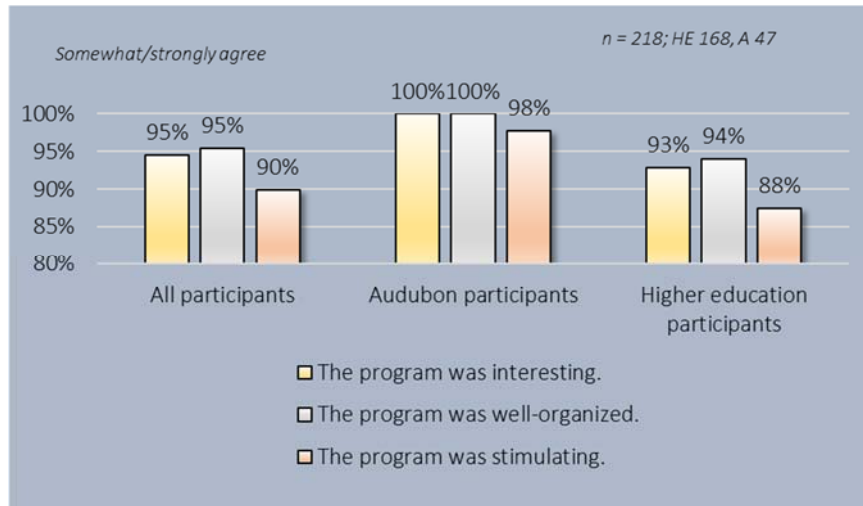


Figure 20. Staff contributions to the program experience

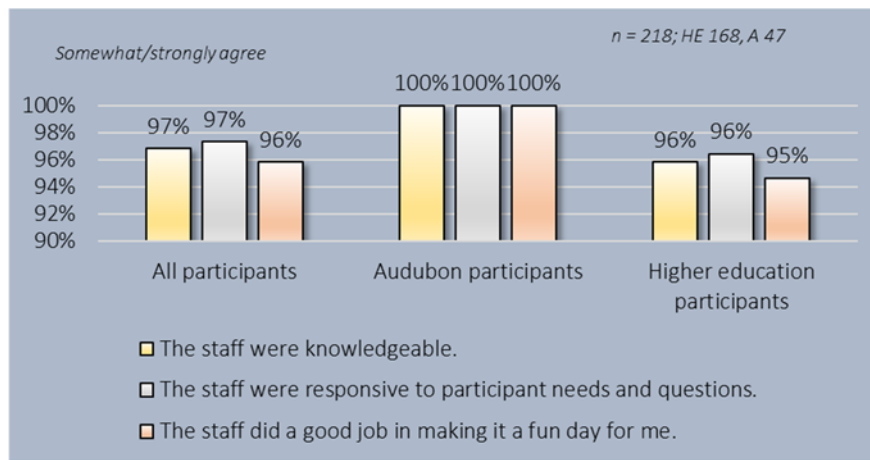
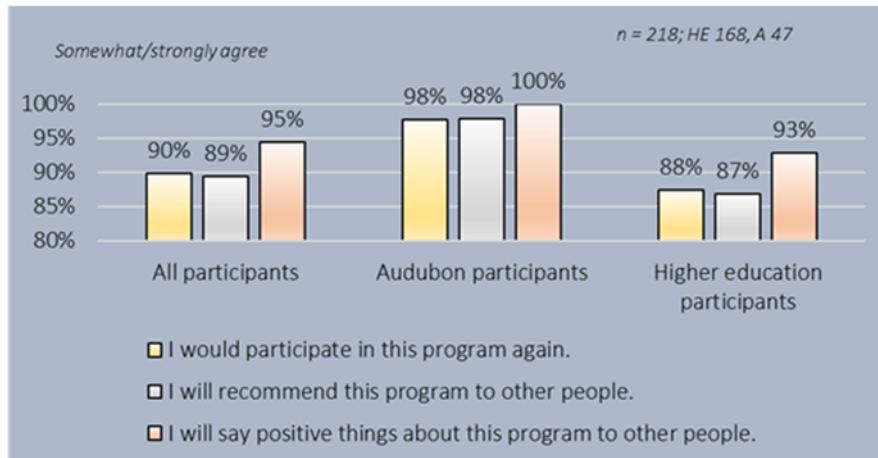


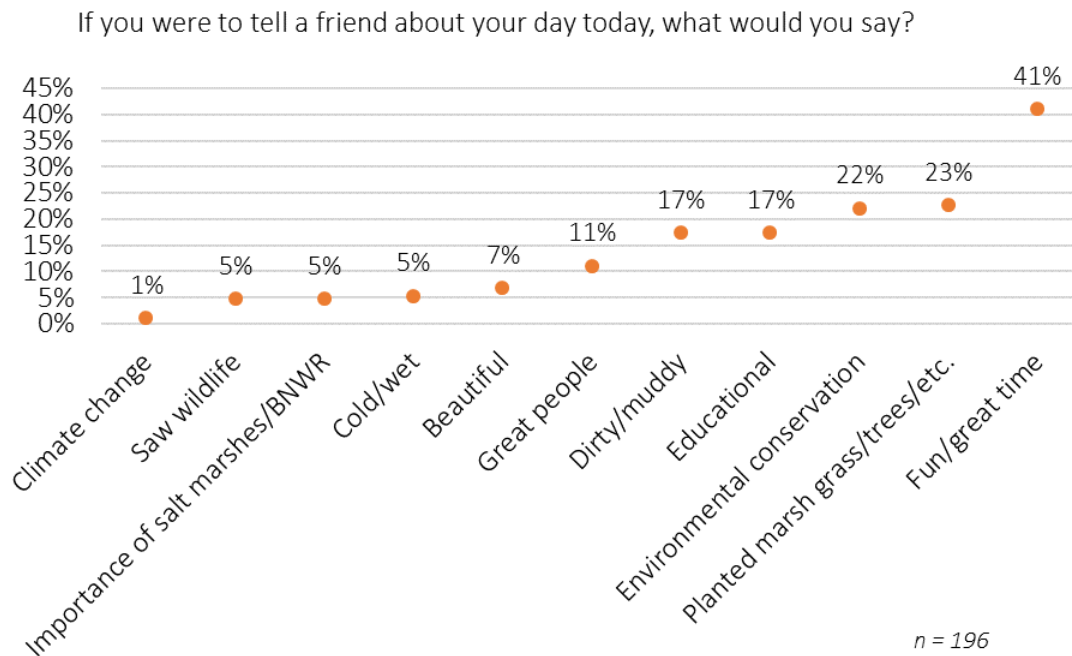
Figure 21. Program recommendation



9.1 What participants would tell others about their experience

When asked how they would describe the day, participants’ most frequent comments are that they had a great or fun time (41%) (Figure 22; Appendix B19). Statements in this category include “fun and dirty,” and “fun in the mud, enjoyment of nature, a great time with nature.” Roughly a quarter of participants describe planting activities (23%), such as “had a great morning planting smooth cord grass with beautiful scenery and enjoyed being outside.” Two in 10 of participants note the environmental benefits of their activities (or suggesting that others also engage in pro-environmental behaviors) (22%), like “I felt good about doing something for the environment in our local area.” Two of the least frequently mentioned topics—along with observations of wildlife (5%), and getting cold or wet (5%)—are the importance of Blackwater NWR and the salt marshes (5%) and climate change (1%). One person who addresses both of these said, “I did not realize the importance to wildlife, especially birds, of a salt marsh. Also, Blackwater Refuge is being affected by climate change at a faster rate than many other places.”

Figure 22. Most salient aspects of the program likely to be communicated

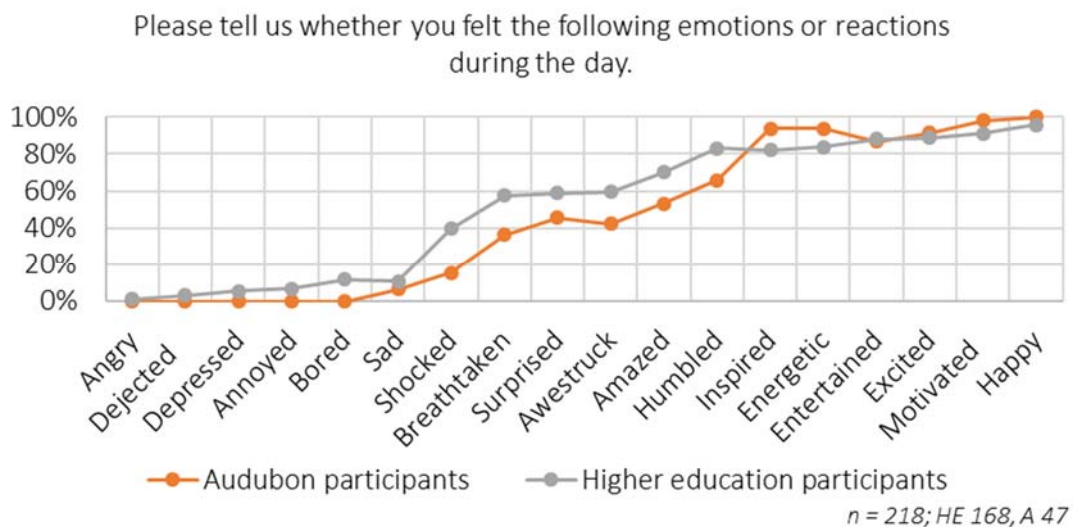


10. Emotions experienced during the program

Environmental attitudes arise from both cognitive beliefs and emotion.³⁴ Some authors claim that direct experiences—such as spending a day in the salt marsh—are more likely to generate attitudes that are based on affect (feelings or emotion) than cognitive beliefs, and that these attitudes are later more easily accessed and influential on behavior.³⁵ Moreover, people are most likely to share strongly emotional experiences with others, especially those that evoke awe (or anger and anxiety).³⁶

Of 18 emotions listed on the survey questionnaire, on average, people said that they experienced nine. Positive emotions—happy (97%), motivated (93%), excited (89%)—are the most frequently cited (Figure 23; Appendix B20). Few people were angry (1%), dejected (2%), or depressed (5%). Research has shown that positive emotional experiences are more likely to be communicated than negative ones. When participants were asked about the predominant emotions they experienced, they said that they were inspired (46%) or humbled (22%) (Figure 24). More than half (55%) said that they experienced those emotions during the planting of the grasses.

Figure 23. Emotions experienced during the program



³⁴ Pooley, J. A., & O'Connor, M. (2000). Environmental education and attitudes: Emotions and beliefs are what is needed. *Environment and Behavior*, 32(5), 711–723.

³⁵ Millar, M. G., & Millar, K. U. (1996). The effects of direct and indirect experience on affective and cognitive responses and the attitude–behavior relation. *Journal of Experimental Social Psychology*, 32(6), 561–579.

³⁶ Berger, J., & Milkman, K. L. (2014). Emotion and virality: What makes online content go viral? *GfK Marketing Intelligence Review*, 5(1), 18–23.

Figure 24. Predominant emotions experienced during the program

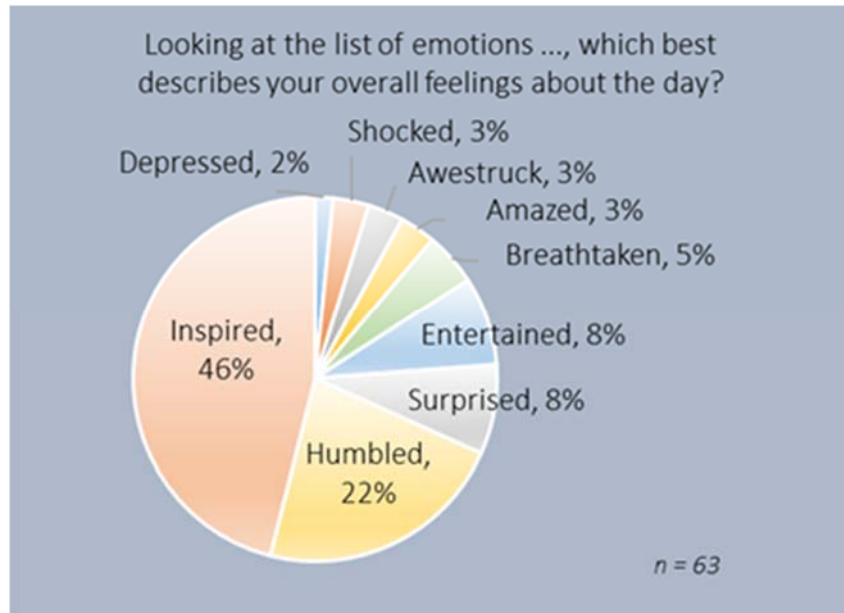
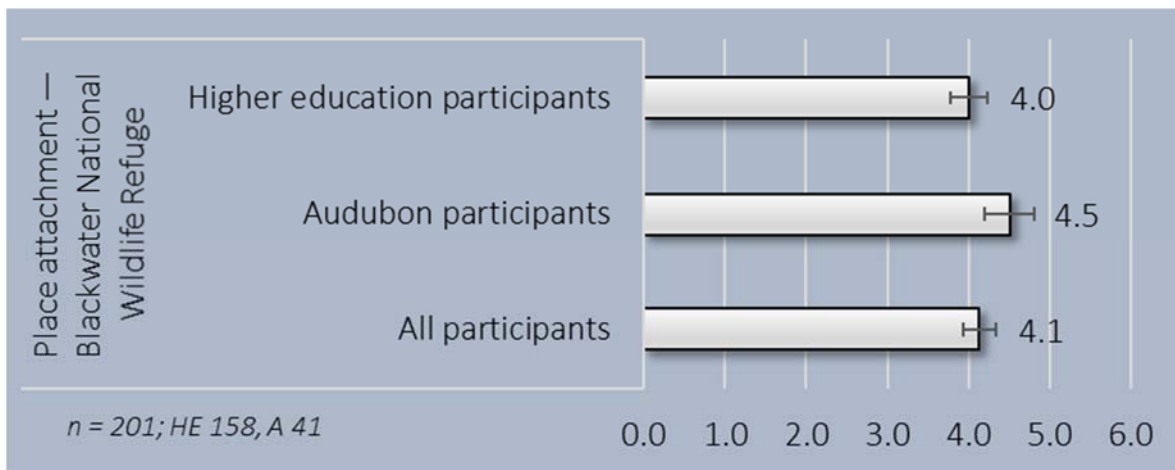


Figure 25. Place attachment to Blackwater National Wildlife Refuge

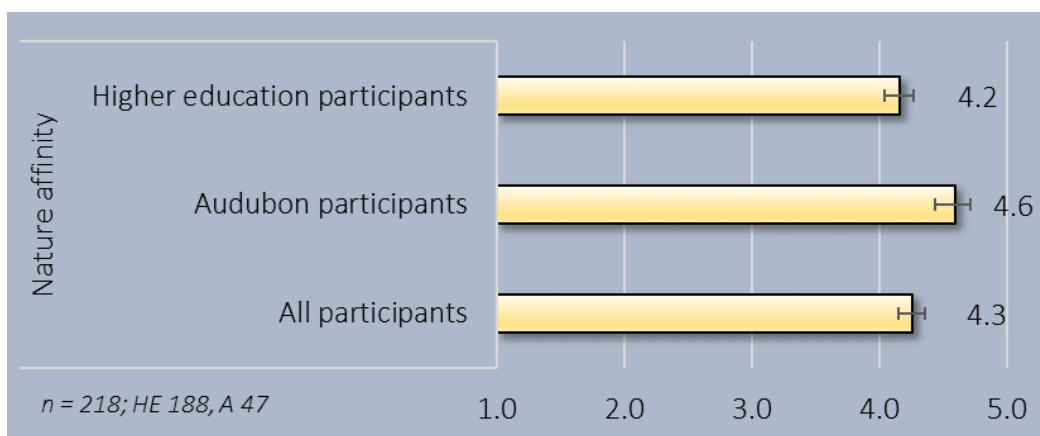


11. Participant attachment to the refuge and to nature

Feelings of place attachment to Blackwater NWR are higher among trip participants (Mean, 4.1) than among the four audiences of the baseline survey (Mean, 3.6).³⁷ Assessing differences within the two audiences consistent across both surveys—higher education and Audubon— higher education respondents show greater levels of emotional connectedness having experienced the trip to Blackwater. This does not hold true for Audubon members.³⁸ There are no differences on affinity to nature between the two surveys, either between the full samples or within the Audubon and higher education audiences.

There were differences *between* the two audiences who participated in the daylong events at Blackwater, however. Audubon members ranked higher on both place attachment and affinity for nature than those from higher education institutions after the trip (Figures 25-26; Appendix B22-B23).³⁹ Audubon members scored a mean of 4.5 on place attachment and 4.6 on nature affinity after their time in the salt marshes versus, respectively, a 4.0 and 4.2 among higher education participants.

Figure 26. Affinity—or relatedness—to nature



³⁷ Place attachment, $t(392) = -3.63, p < 0.001$.

³⁸ Audubon, $M_{\text{Baseline}} = 4.05, M_{\text{Trip}} = 4.51, t(69) = -1.75, p = 0.08$; higher education, $M_{\text{Baseline}} = 3.31, M_{\text{Trip}} = 4.01, t(215) = -3.08, p < 0.01$.

³⁹ Place attachment, $t(95) = -2.64, p < 0.05$; nature affinity, $t(119) = -4.60, p < 0.001$.

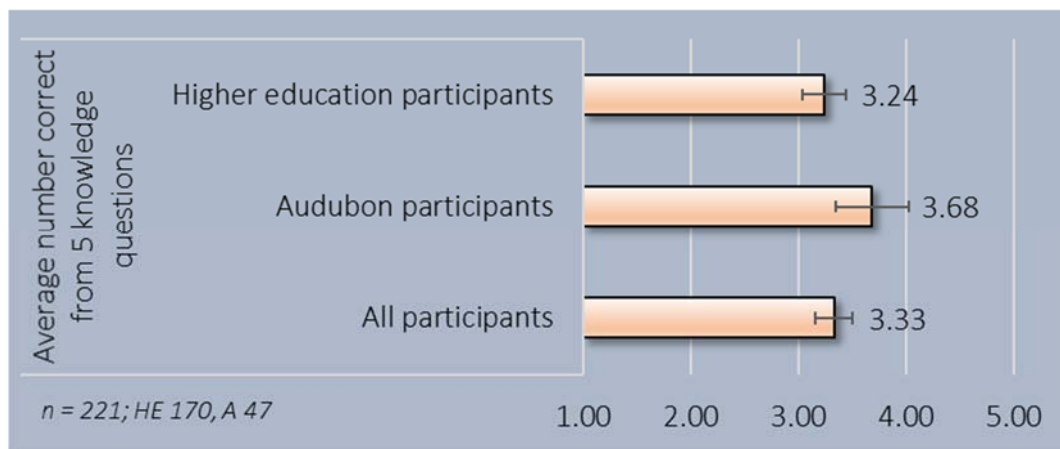
12. Understanding of salt marshes, sea level rise, and climate

Trip participants on average correctly answer more than 3 questions out a total of 5 on the salt marshes and sea level rise (Mean, 3.3) (Figure 27; Appendix B29). Baseline survey participants score almost a full point lower (Mean, 2.5). When assessing differences across the surveys within audiences, there are no differences on knowledge for Audubon members, but there are positive gains on the trip survey for the academic audience.⁴⁰ Even with these higher numbers, Audubon members answer a significantly greater number of questions than higher education participants on the trip survey—an average of 3.7 compared to 3.2.⁴¹

12.1 Certainty of sea level rise higher among Audubon and higher education participants

Trip participants are also more certain that climate change and sea level rise are occurring than the baseline survey participants.⁴² Roughly a quarter say they are very or extremely sure that climate change is happening (77%) and that sea level rise is occurring off of Maryland's coastlines (74%) (Figure 28; Appendix B30-B31). In the baseline survey, only 69% say that they are very or extremely sure climate change is happening, and less than half—48%—are similarly certain that sea level rise is happening (Appendix A47-A48). When analyzed separately, Audubon and higher education audiences are more likely on the trip survey than the baseline survey to say that sea level rise is happening, but not that climate change is occurring.⁴³ Comparing audiences on the Blackwater NWR trip, Audubon members are significantly more likely to say that they are certain about climate change and sea level rise than those from higher education institutions.⁴⁴

Figure 27. Average number of correct answers to five knowledge questions



⁴⁰ Audubon, $M_{\text{Baseline}} = 3.34$, $M_{\text{Trip}} = 3.68$, $t(89) = -1.46$, $p = 0.15$; higher education, $M_{\text{Baseline}} = 2.15$, $M_{\text{Trip}} = 3.24$, $t(88) = -4.77$, $p < 0.001$.

⁴¹ $t(215) = -2.17$, $p < .05$.

⁴² Climate change, $t(419) = -2.72$, $p < .01$; sea level rise, $t(425) = -5.41$, $p < .001$.

⁴³ SLR Audubon, $M_{\text{Baseline}} = 7.93$, $M_{\text{Trip}} = 8.47$, $t(77) = -2.36$, $p < 0.05$; SLR higher education, $M_{\text{Baseline}} = 7.41$, $M_{\text{Trip}} = 7.90$, $t(225) = -2.58$, $p < 0.05$; CC Audubon, $M_{\text{Baseline}} = 8.07$, $M_{\text{Trip}} = 8.44$, $t(87) = -1.61$, $p = 0.11$; CC higher education, $M_{\text{Baseline}} = 7.69$, $M_{\text{Trip}} = 8.00$, $t(220) = -1.39$, $p = 0.17$.

⁴⁴ Climate change, $t(204) = -2.55$, $p < .05$; sea level rise, $t(211) = -2.89$, $p < .001$.

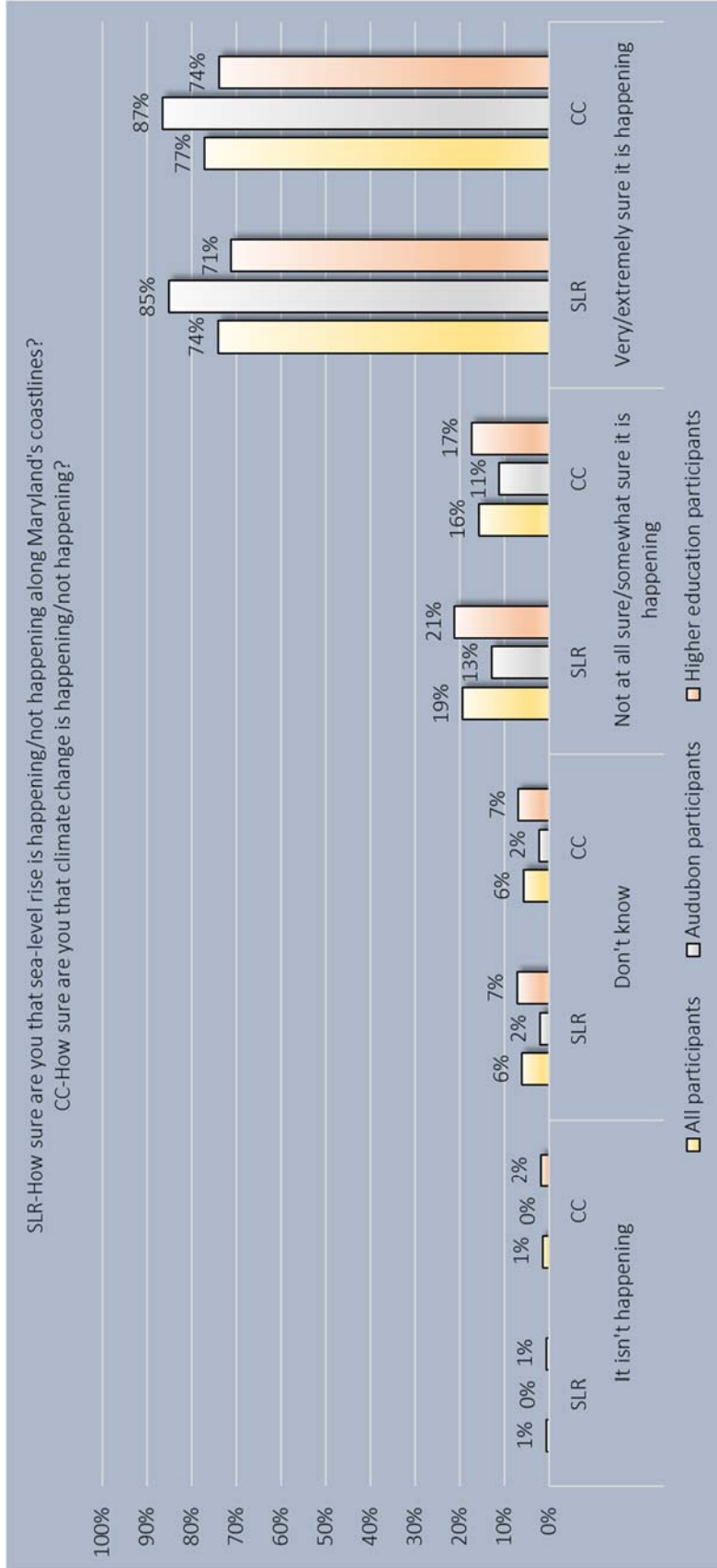


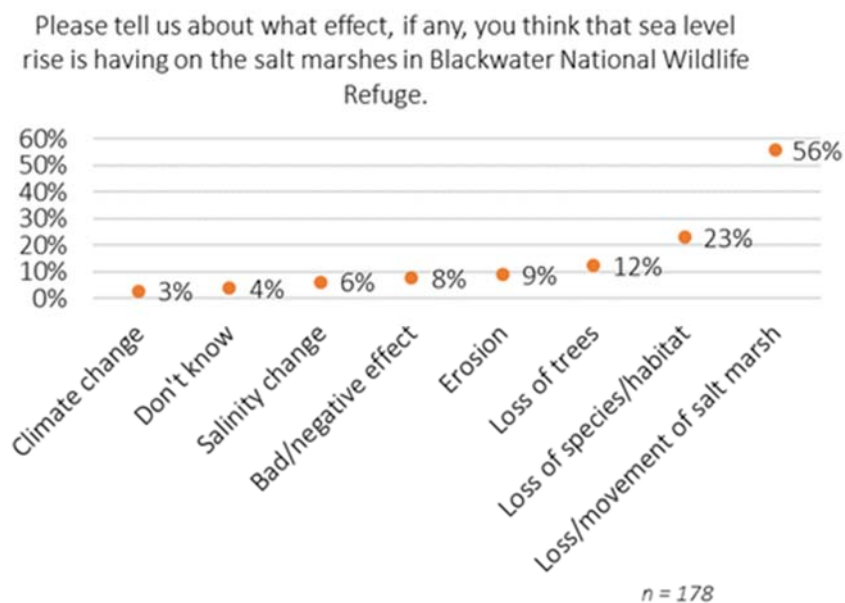
Figure 28. Audience certainty that sea level rise and climate change are happening

12.2 Trip attendees call out loss of salt marshes due to sea level rise

In an open-ended question, we sought to assess how the participants in the daylong educational and experiential event understand the relationship between sea level rise and changes in the marshes. Each of the responses was coded for eight categories that were frequently mentioned. Most people (56%) correctly say that sea levels are causing the loss or movement of the salt marshes as previous areas of marshland become open water, and new lands flood, allowing for migration (Figure 29; Appendix B36). As one respondent says, “we are losing a lot of area to open water which is reducing the marsh areas.”

About a quarter (23%) also connect the rising waters to species and their habitats, as in one respondent’s statement that “the plants and animals are losing some of their natural habitat.” The loss of trees—especially pine trees—is often singled out as particularly characteristic (12%), such as “sea level rise kills pine trees, pine needles fall off and change the land in the marsh.” The other dynamics mentioned by respondents include erosion (9%), salinity changes (6%), and climate change (3%).

Figure 29. Understanding of the effects of sea level rise on the salt marshes



13. Participant issue involvement and communicative intent

Trip participants report being more highly involved in the salt marshes and sea level rise than baseline survey respondents, as measured by levels of caring and self-reported knowledge (Appendix A32-A37; B37-B41).⁴⁵ Analysis by group demonstrates that Audubon members who attended the Blackwater NWR trip are more likely to report caring extremely about both the salt marshes and sea level rise, but not feel more extremely knowledgeable about the topics.⁴⁶ Higher education participants cite higher rates of caring about the marshes and sea level rise, and being knowledgeable about sea level rise, but are not more likely to feel knowledgeable about the salt marshes.⁴⁷

Audubon members during the Blackwater NWR trip are also more likely to care “extremely” for the salt marshes than do those from higher education institutions.⁴⁸ More than two-thirds of participants affiliated with Audubon (67%) report that they extremely care for the salt marshes, compared to just 40% of students and faculty from regional colleges and universities (Figure 30). Otherwise, the groups differ little on the other measures of salt marsh and sea level rise involvement (Figures 30-31; Appendix B37-B41).

Similarly small groups of both audiences say that they are extremely likely to talk about the salt marshes (28%) and sea level rise (22%) with family and friends after the daylong program (Figures 30-31; Appendix B39 and B42), but fewer anticipate talking about sea level rise than the salt marshes.⁴⁹ Between about a quarter and a third of higher education (25%) and Audubon (35%) trip participants indicate high levels of communicative intent regarding the salt marshes, and respectively 20% and 28% regarding sea level rise.

⁴⁵ Tests on frequency of “extremely” responses. Salt marsh caring, $X^2(1, n = 428) = 32.80, p < 0.001$; sea level rise caring, $X^2(1, n = 428) = 41.05, p < 0.001$; salt marsh knowledge, $X^2(1, n = 428) = 7.07, p < 0.01$; sea level rise knowledge $X^2(1, n = 427) = 13.01, p < 0.001$.

⁴⁶ Tests on frequency of “extremely” responses. Audubon caring/salt marshes, $M_{\text{Baseline}} = 0.32, M_{\text{Trip}} = 0.67, t(87) = -3.47, p < 0.01$; knowledge/salt marshes, $M_{\text{Baseline}} = 0.09, M_{\text{Trip}} = 0.09, t(88) = 0.07, p = 0.95$; caring/SLR, $M_{\text{Baseline}} = 0.25, M_{\text{Trip}} = 0.61, t(88) = -3.65, p < 0.001$; knowledge/SLR, $M_{\text{Baseline}} = 0.02, M_{\text{Trip}} = 0.13, t(63) = -1.95, p = 0.06$.

⁴⁷ Tests on frequency of “extremely” responses. Higher education caring/salt marshes, $M_{\text{Baseline}} = 0.13, M_{\text{Trip}} = 0.40, t(154) = -4.57, p < 0.001$; knowledge/salt marshes, $M_{\text{Baseline}} = 0.07, M_{\text{Trip}} = 0.13, t(145) = -1.62, p = 0.11$; caring/SLR, $M_{\text{Baseline}} = 0.23, M_{\text{Trip}} = 0.46, t(125) = -3.39, p < 0.01$; knowledge/SLR, $M_{\text{Baseline}} = 0.03, M_{\text{Trip}} = 0.12, t(192) = -2.56, p < 0.05$.

⁴⁸ Tests on frequency of “extremely” responses. Salt marsh caring, $X^2(1, n = 212) = 10.54, p < 0.01$.

⁴⁹ Paired t tests, $t(215) = -3.64, p < 0.001$.

Figure 30. Salt marsh issue involvement and communication

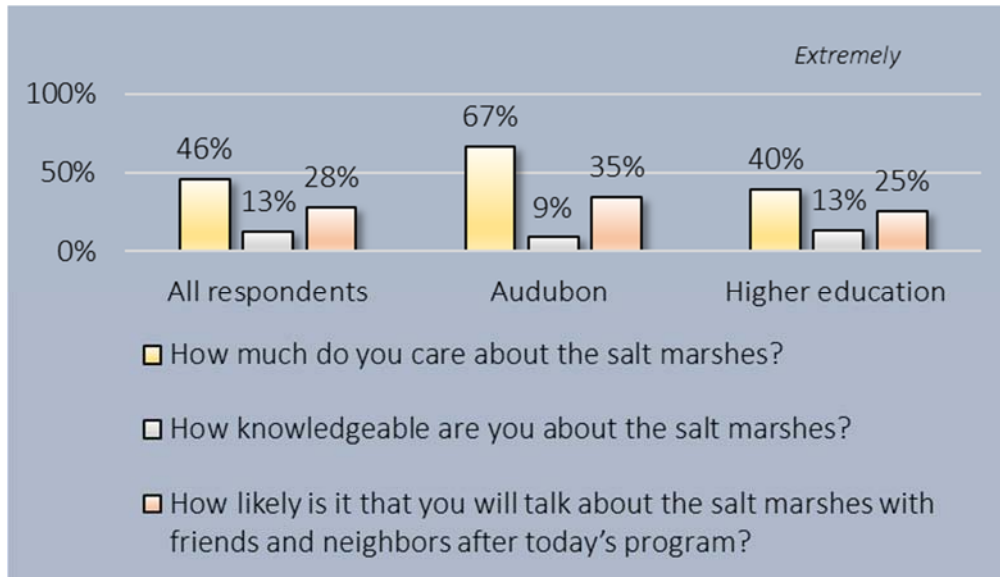
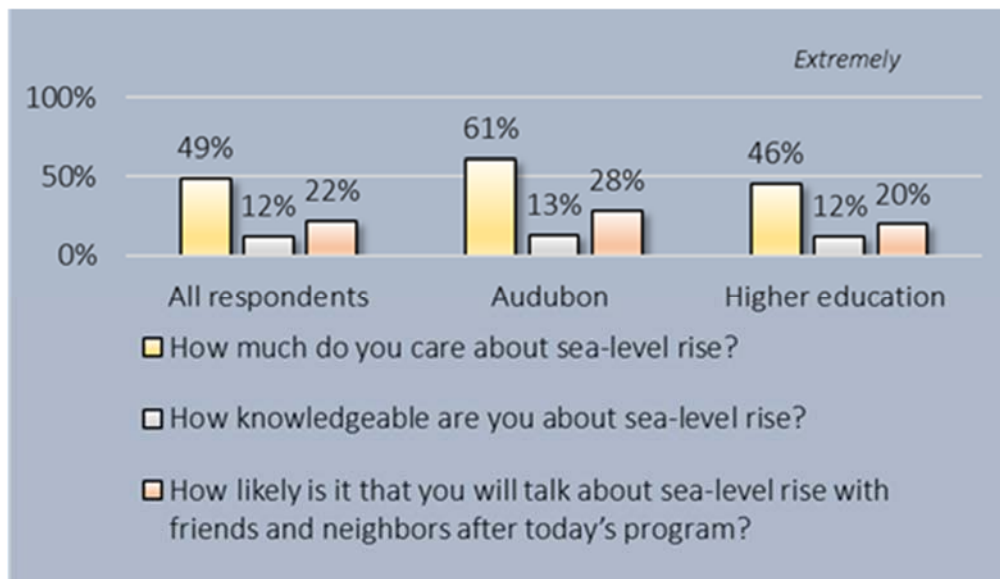


Figure 31. Sea level rise issue involvement and communication



13.1 Emotional experiences relate to communicative intent

We hypothesized that some emotions would correlate more strongly with intent to talk about the salt marshes and sea level rise (Table 4). The top five emotions related to intention to communicate about the salt marshes are “inspired,” “excited,” “motivated,” “entertained,” and “breathtaken.” The top five for sea level rise are “inspired,” “motivated,” “breathtaken,” “awestruck,” and “excited.” Almost half of participants (46%) say that the primary emotion they experienced while at Blackwater NWR was inspiration (Figure 24). Feeling humbled—the second highest reported primary emotion (22%)—was not highly correlated with communicative intent.

Table 4. Relationship between experienced emotion and likelihood for issue discussion

	How likely is it that you will talk about the salt marshes with friends and neighbors after today's program?	How likely is it that you will talk about sea-level rise with friends and neighbors after today's program?
Inspired	.313**	.274**
Excited	.290**	.194**
Motivated	.288**	.257**
Entertained	.282**	.215**
Breathtaken	.240**	.236**
Awestruck	.231**	.228**
Energetic	.230**	.156*
Shocked	.174*	.151*
Happy	.150*	--
Bored	--	-.156*

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

14. Factors related to issue and program communication

During their time at Blackwater NWR, participants experience place attachment to the refuge, an array of emotions, connections to the group and to nature, and learning opportunities. Based on previous social science research, we believe each of these dimensions can play a critical role in affecting pro-environmental behavior change, including communication. However, not all of these factors may be equal in the context of this particular education program and its audiences. By modeling the relative influence of each factor on communication intent and disposition to positively recommend the program to others, we can identify which are likely more important.

Place attachment and affinity for nature (or relatedness) are the most consistently related to communication intent and program recommendation (Table 5). Number of experienced emotions, feelings of bonding with the group, and higher scores on topic area knowledge also significantly predict salt marsh communication intent. The model predicts 37% of salt marsh communication intent, but only 23% of sea level rise communication intent or program recommendations.

Table 5. Important factors for issue discussion and program recommendation

	<i>Standardized model coefficients of predictors</i>		
	Salt marsh communication intent	Sea level rise communication intent	Program recommendation disposition
Male	--	--	--
Audubon member	--	--	--
Number of emotions	0.23	--	--
Emotion--inspired	--	--	--
Emotion--humbled	--	--	--
Group cohesion	0.19	--	--
Place attachment— Blackwater National Wildlife Refuge	0.27	0.19	0.34
Affinity for nature	0.21	0.20	0.18
Topic area knowledge	0.16	--	--
Variance explained by model	37%	23%	23%

15. Understanding program participant experiences

The results from the second part of this research study can be also divided into a series of conclusions: 1) about the trip participants as a whole; 2) differences between the two focal audiences; and 3) differences within audiences between the baseline and trip surveys.

General findings

- 1) Of 18 emotions listed on the survey questionnaire, on average, people experience nine during their time at Blackwater NWR. Almost half of participants (46%) say that the primary emotion they experience while at Blackwater NWR is inspiration. The top five emotions related to intention to communicate about the salt marshes are “inspired,” “excited,” “motivated,” “entertained,” and “breathtaken.”
- 2) The planting of salt marsh grasses is the portion of the day that is most likely to inspire emotion among attendees.
- 3) Trip participants are more certain that climate change and sea level rise are occurring than baseline survey participants. Roughly a quarter say they are very or extremely sure that climate change is happening (77%) and that sea level rise is occurring off of Maryland’s coastlines (74%).
- 4) Trip participants report being more highly involved in the salt marshes and sea level rise than baseline survey respondents, as measured by their caring and self-reported knowledge levels.
- 5) Place attachment and affinity for nature (or relatedness) are the most consistently related to communication intent and program recommendation. Number of experienced emotions, feelings of bonding with the group, and higher scores on topic area knowledge also significantly predict salt marsh communication intent.

Differences between audiences

- 1) Higher education students and faculty feel more bonded as a group than Audubon members. More than half of higher education students and faculty feel a very or extremely strong sense of belonging to the group (58%), as opposed to just under half for Audubon (43%). Half of the students and faculty feel very or extremely close to other group members (50%), whereas 34% of Audubon members do.
- 2) Audubon members who participated in the Blackwater NWR event rank higher on place attachment (Mean, 4.5/6) and affinity for nature (Mean, 4.6/5) than those from higher education institutions (Means, 4.0/6, 4.2/5).
- 3) Audubon members who participate in the Blackwater NWR program know more. They answer a greater number of questions on the salt marshes and sea level rise than higher education participants—an average of 3.7 compared to 3.2 out of 5.0 possible.
- 4) In the trip survey, Audubon members are more likely to say that they are certain about climate change and sea level rise than those from academic institutions.
- 5) Audubon members are more likely to say that they extremely care for the salt marshes after spending the day at Blackwater NWR than do those from higher education institutions. More than two-thirds of participants affiliated with Audubon

(67%) report that they “extremely” care for the salt marshes, compared to just 40% of students and faculty from regional colleges and universities.

Differences between surveys within higher education and Audubon audiences

- 1) Higher education participants on the Blackwater trip show greater levels of emotional connectedness to the refuge (place attachment) compared to baseline survey data; Audubon members—already at high levels—do not. Higher education audience members also demonstrate higher levels of assessed knowledge on salt marsh and sea level rise, while Audubon affiliates do not.
- 2) Audubon members who attend the Blackwater NWR trip are more likely to report caring extremely about both the salt marshes and sea level rise, but not feel more extremely knowledgeable about the topics. Higher education participants cite higher rates of caring about the marshes and sea level rise, and being knowledgeable about sea level rise, but are not more likely to feel knowledgeable about the salt marshes.
- 3) Audubon and higher education audiences are more likely on the trip survey than the baseline survey to say that sea level rise is happening, but not that climate change is occurring.

16. Program experiences: Conclusion and recommendations

The high ratings of Pickering Creek Audubon Center's program and staff at Blackwater National Wildlife Refuge demonstrate its success in engaging Audubon and higher education audiences in restoring the salt marshes, even on cold and rainy days in which participants spend a lot of time in the muddy water. These experiences—especially the grass plantings—engender positive emotions, including many that are correlated with intention to share their experiences with others. These emotions are most often felt when participants are directly engaged with the salt marshes, planting grasses. The process of connecting with nature occurs in parallel with social bonding. Working together for a common cause—marsh restoration—the participants feel belonging with other members of the group.

The measures of emotion and group bonding suggest that the daylong event created the context for attitudinal change. Analyzing data from the two audiences which both took the baseline survey and participated in the outreach program, we see that when there are significant differences, they are always toward higher knowledge and issue involvement. Indeed, we see greater levels of place attachment to the refuge (higher education); higher levels of assessed knowledge (higher education); caring extremely about both the salt marshes and sea level rise (Audubon and higher education), knowledge about sea level rise (higher education); and certainty that sea level rise is happening (higher education and Audubon).

While it cannot be assumed that the differences between the samples were only due to the intervention because of the comparisons across organizational affiliations instead of individuals, it certainly is suggestive that even with audiences that are already highly educated and with biospheric values, there was a shift upward between the two surveys across these series of measures. Moreover, two of the dynamics that can be attributed to the outreach activities—emotional engagement and social bonding—are demonstrably influential in predicting intent to communicate about the salt marshes with friends and family, as is sea level rise and salt marsh topic knowledge. Place attachment and affinity for nature are related to all three variables of interest—intent to talk about the salt marshes and sea level rise, and to recommend Pickering Creek's program to others.

Of note is that the majority of Audubon participants had already visited the refuge before the daylong trip with Pickering Creek; that was not the case for those from higher education institutions. There are sharp differences in the characteristics of the two audiences, with Audubon members generally demonstrating greater knowledge, attitudinal certainty, and issue involvement.

This analysis leads to the following recommendations for program design and to increase post-program communication with the wider community on the salt marshes and sea level rise:

- Recognize the times—like the salt marsh plantings—where participants engage emotionally as the points that highly relate to whether a participant voices interest in relating to others what they did and learned.

- Look for opportunities to help the group members bond and express their motivations for restoring the salt marshes.
- Promote repeat visits to the marshes—and place attachment—by offering information on how to get involved in other ways.
- Provide a way for participants to remember how close they felt to nature at the refuge, such as a sun print of a leaf they can take home with them, a mud print of their hand or boot, or a couple of short sentences written on a note card that describe an important moment for them.
- Ask participants what they think their friends and family know about sea level rise and the salt marshes. Encourage participants to talk with others about these issues and what they did at the refuge.
- People may not believe that others care what they think. Tell them how important their attitudes are in shaping those of others.



- Use survey data to prompt conversations about perceptions of social consensus. Ask participants, what percentage of people on the Eastern Shore do you think believe think that sea level rise is happening off Maryland's shores? (55.6%, SLR happening; 32.7%, don't know; 11.7%, SLR not happening)
- Encourage participants to post their images of the day on social media and tag Pickering Creek and the refuge.

Audubon, Higher Education, Business, & Faith Audience
Baseline Data

Appendix A

Audience affiliation, baseline survey

Table A1

Audience affiliation		
		%
Audubon (n=204)		21.6
Higher education (n=205)		32.7
Business community (n=205)		29.8
Faith community (n=203)		43.3

Demographics, baseline survey

Table A2

What is your gender?		
		%
Male		29.6
Female		70.4
n =		206

Table A3

Age		
		%
18 to 24 years old		29.3
25 to 34 years old		11.2
35 to 44 years old		7.8
45 to 54 years old		13.2
55 to 64 years old		20.0
65 to 74 years old		14.6
75 to 84 years old		3.9
n =		205

Table A4

What is the highest degree or level of school that you have completed?		
		%
Less than high school		.5
High school or GED		29.5
2-year associate's degree or trade school		15.9
4-year college degree		22.7
Advanced degree beyond 4-year degree		31.4
n =		207

Table A5

What ethnicity do you consider yourself?		
		%
Hispanic or Latino		2.4
Not Hispanic or Latino		97.6
n =		205

Table A6

Race		
		%
White		88.3
African American		5.4
Asian		1.0
American Indian or Alaska Native		.5
Native Hawaiian or other Pacific Islander		1.0
Other		1.5
Two or more races		2.4
n =		205

[Continued] Demographics, baseline survey

Table A7

Household annual income		%
Less than \$10,000		3.5
\$10,000-\$14,999		5.6
\$15,000-\$24,999		7.6
\$25,000-\$34,999		8.1
\$35,000-\$49,999		13.6
\$50,000-\$74,999		14.6
\$75,000-\$99,999		19.7
\$100,000-\$149,999		11.6
\$150,000 or more		15.7
n =		198

Table A8

Generally speaking, do you think of yourself as politically ...		%
Very conservative		6.8
Somewhat conservative		20.9
Moderate, middle of the road		33.0
Somewhat liberal		21.8
Very liberal		17.5
n =		206

Community place attachment

Table A9

	In which county in Maryland do you live?				
	All respondents	Audubon	Higher education	Business community	Faith community
Dorchester	10.9%	4.5%	3.0%	29.5%	19.3%
Talbot	26.5%	25.0%	9.0%	54.1%	30.7%
Caroline	3.9%	0.0%	1.5%	9.8%	3.4%
Queen Anne's	2.2%	0.0%	1.5%	3.3%	3.4%
Kent	1.3%	2.3%	1.5%	0.0%	2.3%
Cecil	0.0%	0.0%	0.0%	0.0%	0.0%
Wicomico	13.0%	0.0%	31.3%	1.6%	5.7%
Somerset	1.3%	0.0%	1.5%	0.0%	1.1%
Worcester	5.7%	0.0%	16.4%	0.0%	6.8%
Other county in Maryland (Please write)	35.2%	68.2%	34.3%	1.6%	27.3%
n =	230	44	67	61	88

Table A10

Please tell us briefly which aspects of your community are most important to you? (Coded from open-ended responses.)	
Environment/nature	34%
People	20%
Wildlife/habitat	18%
Recreation/activities	17%
Conservation activities	14%
Water/Chesapeake Bay	13%
Parks	10%
Safety	9%
Education	8%
Agriculture	6%
Economy/development	6%
Clean	6%
Outdoor access	5%
Rural	5%
Faith	5%
Arts/culture	5%
n =	196

[Continued] Community place attachment

Table A11

		Town or community attachment				
		All respondents	Audubon	Higher education	Business community	Faith community
I have negative feelings for this place.	False	88.4%	81.4%	86.6%	93.4%	92.0%
	True	11.6%	18.6%	13.4%	6.6%	8.0%
	n =	216	43	67	61	88
I have no particular feelings for this place.	False	88.3%	90.2%	89.4%	90.2%	86.2%
	True	11.7%	9.8%	10.6%	9.8%	13.8%
	n =	213	41	66	61	87
I do not think of myself as being from this place.	False	64.0%	70.0%	60.6%	63.9%	65.9%
	True	36.0%	30.0%	39.4%	36.1%	34.1%
	n =	211	40	66	61	85
I have an emotional attachment to this place -- it has meaning to me.	False	17.6%	11.6%	17.9%	14.8%	14.8%
	True	82.4%	88.4%	82.1%	85.2%	85.2%
	n =	216	43	67	61	88
I am willing to invest my talent or time to make this an even better place.	False	13.0%	9.3%	12.1%	8.2%	10.2%
	True	87.0%	90.7%	87.9%	91.8%	89.8%
	n =	215	43	66	61	88
I am willing to make financial sacrifices for the sake of this place.	False	40.4%	26.2%	50.7%	37.3%	29.1%
	True	59.6%	73.8%	49.3%	62.7%	70.9%
	n =	213	42	67	59	86

Table A12

Place attachment -- Your town or community					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	4.72	4.92	4.61	4.85	4.94
95% CI	4.53	4.55	4.24	4.58	4.67
n	4.90	5.27	4.97	5.08	5.18
	184	39	61	53	80

Blackwater NWR place attachment

Table A13

		Place attachment to Blackwater National Wildlife Refuge				
		All respondents	Audubon	Higher education	Business community	Faith community
I have negative feelings for this place.	False	97.6%	97.6%	98.5%	96.6%	97.7%
	True	2.4%	2.4%	1.5%	3.4%	2.3%
	n =	207	41	65	58	86
I have no particular feelings for this place.	False	71.7%	87.5%	63.1%	71.9%	69.4%
	True	28.3%	12.5%	36.9%	28.1%	30.6%
	n =	205	40	65	57	85
I do not think of myself as being from this place.	False	26.3%	25.0%	24.6%	34.5%	33.3%
	True	73.7%	75.0%	75.4%	65.5%	66.7%
	n =	205	40	65	58	84
I have an emotional attachment to this place -- it has meaning to me.	False	51.2%	25.0%	67.7%	43.1%	50.0%
	True	48.8%	75.0%	32.3%	56.9%	50.0%
	n =	205	40	65	58	84
I am willing to invest my talent or time to make this an even better place.	False	33.3%	34.1%	21.5%	35.1%	34.5%
	True	66.7%	65.9%	78.5%	64.9%	65.5%
	n =	204	41	65	57	84
I am willing to make financial sacrifices for the sake of this place.	False	52.5%	43.9%	56.9%	55.4%	50.6%
	True	47.5%	56.1%	43.1%	44.6%	49.4%
	n =	204	41	65	56	83

[Continued] Blackwater NWR place attachment

Table A14

Place attachment -- Blackwater National Wildlife Refuge					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	3.61	4.08	3.39	3.70	3.64
95% CI	3.39 3.85	3.64 4.49	2.96 3.82	3.20 4.15	3.29 3.97
n	184	39	61	53	80

Awareness of and visits to Pickering Creek Audubon Center

Table A15

Had you heard of Pickering Creek Audubon Center, located in Easton, before today?					
	All respondents	Audubon	Higher education	Business community	Faith community
No	39.3%	11.4%	59.7%	26.2%	36.4%
Yes	59.9%	88.6%	38.8%	73.8%	63.6%
I don't know	.8%	0.0%	1.5%	0.0%	0.0%
n =	242	44	67	61	88

Table A16

Have you ever visited Pickering Creek Audubon Center?					
	All respondents	Audubon	Higher education	Business community	Faith community
No	64.0%	47.7%	85.1%	50.8%	62.5%
Yes	35.1%	50.0%	13.4%	49.2%	36.4%
I don't know	.8%	2.3%	1.5%	0.0%	1.1%
n =	242	44	67	61	88

Table A17

Have you, or your children, ever participated in a program run by Pickering Creek Audubon Center?-You					
	All respondents	Audubon	Higher education	Business community	Faith community
No	78.8%	52.3%	80.6%	80.3%	80.7%
Yes	17.1%	40.9%	9.0%	16.4%	15.9%
I don't know	2.1%	2.3%	7.5%	0.0%	2.3%
Not applicable	2.1%	4.5%	3.0%	3.3%	1.1%
n =	240	44	67	61	88

Table A18

How frequently have you visited Pickering Creek Audubon Center?						
		All respondents	Audubon	Higher education	Business community	Faith community
In the past 12 months	Once	39.5%	26.3%	11.1%	28.6%	37.9%
	A few times (2-3)	14.5%	21.1%	33.3%	14.3%	20.7%
	Several times (4-5)	6.6%	10.5%	11.1%	7.1%	10.3%
	Many times (6+)	13.2%	36.8%	11.1%	10.7%	6.9%
	I don't know	26.3%	5.3%	33.3%	39.3%	24.1%
n =		76	19	9	28	29
In previous years	Once	27.1%	18.2%	0.0%	36.7%	34.4%
	A few times (2-3)	27.1%	13.6%	11.1%	26.7%	21.9%
	Several times (4-5)	8.2%	4.5%	0.0%	6.7%	9.4%
	Many times (6+)	31.8%	54.5%	66.7%	30.0%	31.3%
	I don't know	5.9%	9.1%	22.2%	0.0%	3.1%
n =		85	22	9	30	32

[Continued] Visits to Pickering Creek Audubon Center

Table A19

		Which programs have you participated in?				
		All respondents	Audubon	Higher education	Business community	Faith community
Bird Walk	No	92.7%	80.0%	100.0%	90.9%	94.0%
	Yes	7.3%	20.0%	0.0%	9.1%	6.0%
	n =	179	40	28	55	67
A school program with your children or grandchildren	No	94.0%	92.5%	90.0%	87.9%	91.5%
	Yes	6.0%	7.5%	10.0%	12.1%	8.5%
	n =	183	40	30	58	71
Marsh Grass Restoration Days (Blackwater National Wildlife Refuge)	No	96.1%	92.5%	90.0%	94.6%	95.6%
	Yes	3.9%	7.5%	10.0%	5.4%	4.4%
	n =	181	40	30	56	68
Harvest Hoedown	No	88.5%	68.3%	93.3%	91.2%	89.9%
	Yes	11.5%	31.7%	6.7%	8.8%	10.1%
	n =	183	41	30	57	69
Volunteering and e-Bird Monitoring	No	94.4%	80.0%	100.0%	96.4%	95.5%
	Yes	5.6%	20.0%	0.0%	3.6%	4.5%
	n =	179	40	28	55	67
Salt Marsh Stories (educational talks held off-site at universities, businesses, churches and Audubon chapter meetings)	No	98.3%	95.0%	100.0%	98.2%	100.0%
	Yes	1.7%	5.0%	0.0%	1.8%	0.0%
	n =	179	40	28	55	67

Table A20

What did you enjoy the most about the programs you have attended?
Beautiful site and very helpful staff.
Being on such a beautiful piece of property. Samantha is great.
Being outdoors in a beautiful environment.
Being outdoors supporting an organization with common values contributing to PCAC
Everyone is friendly and I just like being outdoors.
Everything
Friendly and knowledgeable staff
Gaining more knowledge about a subject I'm passionate about. Being outdoors in the countryside with other like-minded folks.
I enjoyed being outside "alone" on the sanctuary trying to provide help directly to Pickering Creek Sanctuary in it being an example of a "recognized Local conservation, agricultural and environmental organization" trying to advance the educational process.
I honestly don't remember I was really young.
I liked the different events that were available
I teach, and involve my classes, so in addition to enjoying the experience I am grateful to get a chance to expose our students to the Pickering Creek folks and their good work.
Learning from the great staff and volunteers at PCAC, enjoying the range of habitats at the Center, and feeling that I have contributed to the organization.
Location
New insights into bird behavior
Seeing how well Pickering Creek is carrying out its mission of both land preservation and youth education.
spending time at the beautiful property, getting out on the water
staff is great and we love the interaction with the marsh via kayak
The children were able to interact with nature in a fun and educational way that made them eager to learn.
The environment
the physical location
The staff is amazing!!!! Learning about all the different bird species. Really enjoyed it!!!!
The staff was very knowledgeable about the environment/programs. The activities were fun and age appropriate.
Those that were there were talking about how Pickering Creek started and their different programs they were working on. When I was there it was anywhere between 2000 -2005 and I went when I was working with Caroline County Public Library.
Very educational and the volunteers are always great!
wonderful, well-informed staff, fabulous facility and environment
Worked with Chesapeake Audubon in the early days of Pickering Creek, before there were center programs. Helped to build some of the trails. Also went on an organized canoe trip with Chesapeake Audubon. Enjoyed both events.

[Continued] Visits to Pickering Creek Audubon Center

Table A21

Is there anything that Pickering Creek could do to improve its programs for adults?
A better Welcome Center for casual walk-ins
Adult education efforts need to be stepped up by ALL conservation groups, not just Pickering Creek. While youth education is important, it is adults who vote and make decisions effecting families and society in general.
Advertise them to western shore Audubon members, such as myself. I rarely hear about Pickering Creek Programs. But keep in mind that I am not likely to drive from Harford County to Easton more than once or twice a year.
Better facilities for speakers and audiences. Current space tiny & cramped. Take a look at the way the Mass Audubon Society programs operate and the range of programs and activities for adults and children. Pickering could learn from them.
Engage younger adults in programs (20s-40s).
Hard to say with only one visit.
Have more of them?
Have more public exposure to the "Eastern Shore" counties surrounding Pickering Creek by public awareness of adult conservation, adult environment education, adult volunteer programs, adult scientific educators, adult conservation/environment speakers.
I don't think so.
I have enjoyed the couple of classes that I have taken and as I said before the staff is amazing and the knowledge that they share is fantastic!!
I know it may be a problem not easy to solve, but the ticks can be overwhelming along the trails and even areas near buildings. I find I am reluctant to go there.
Move it closer to Salisbury :)!
No, The programs are perfectly fine.
None at this time.
Not that I am aware of.
Not that I know of.
Nothing I can think of at this time.
Probably but I can't readily identify it.
Send email reminders of upcoming programs.
speaker series held in downtown Easton, with a visit to a tavern when it's over / / off site trips for adults, including canoe trips on Shore rivers like the Pocomoke, cycling trips, and birding trips to places like Chincoteague, Bombay Hook.

Children's visits and programming

Table A22

Have you, or your children, ever participated in a program run by Pickering Creek Audubon Center?-Your children					
	All respondents	Audubon	Higher education	Business community	Faith community
No	49.4%	41.9%	37.3%	53.3%	53.5%
Yes	11.9%	11.6%	4.5%	23.3%	16.3%
I don't know	.9%	4.7%	1.5%	0.0%	1.2%
Not applicable	37.9%	41.9%	56.7%	23.3%	29.1%
n =	235	43	67	60	86

Table A23

Do you have children?					
	All respondents	Audubon	Higher education	Business community	Faith community
No	56.8%	45.5%	85.1%	39.3%	50.0%
Yes	43.2%	54.5%	14.9%	60.7%	50.0%
n =	241	44	67	61	88

Table A24

How frequently have your children participated in programs run by Pickering Creek Audubon Center?						
		All respondents	Audubon	Higher education	Business community	Faith community
In the past 12 months	Once	27.3%	0.0%	0.0%	25.0%	25.0%
	A few times (2-3)	13.6%	0.0%	0.0%	16.7%	8.3%
	Several times (4-5)	13.6%	0.0%	33.3%	25.0%	25.0%
	Many times (6+)	18.2%	60.0%	33.3%	16.7%	8.3%
	I don't know	27.3%	40.0%	33.3%	16.7%	33.3%
	n =	22	5	3	12	12
In previous years	Once	14.8%	20.0%	33.3%	14.3%	28.6%
	A few times (2-3)	37.0%	0.0%	33.3%	42.9%	35.7%
	Several times (4-5)	3.7%	0.0%	0.0%	0.0%	0.0%
	Many times (6+)	33.3%	60.0%	33.3%	42.9%	28.6%
	I don't know	11.1%	20.0%	0.0%	0.0%	7.1%
	n =	27	5	3	14	14

[Continued] Children's visits and programming

Table A25

		Which programs have your children participated in?				
		All respondents	Audubon	Higher education	Business community	Faith community
EcoCamp	No	96.2%	95.1%	93.3%	91.4%	94.3%
	Yes	3.8%	4.9%	6.7%	8.6%	5.7%
	n =	183	41	30	58	70
Junior Naturalist Camp	No	95.1%	95.1%	93.3%	89.7%	94.3%
	Yes	4.9%	4.9%	6.7%	10.3%	5.7%
	n =	184	41	30	58	70
Tiny Tots	No	100.0%	100.0%	100.0%	100.0%	100.0%
	n =	179	40	28	55	67
Visits to Pickering Creek through their school	No	88.7%	92.7%	93.1%	79.7%	84.5%
	Yes	11.3%	7.3%	6.9%	20.3%	15.5%
	n =	186	41	29	59	71

Table A26

What did your children enjoy the most about the programs they attended?	
Been so long ago I do not remember.	
Being outdoors and learning about their "local" nature	
being outdoors, camping, canoeing	
Being outside doing Nature activities. Also, finding out about their environment.	
Being outside exploring nature and doing fun things. (Summer day camp)	
Being outside in beautiful surroundings and having fun activities to do.	
Building nature habitats, canoeing, water games, catching their own bait, fishing and learning about the reptiles.	
Exposure to the conservation, agricultural and environment attributes of Pickering Creek.	
Friendly and knowledgeable staff, outdoor activities	
great educational information, fun activities	
Many hands on activities	
Variety of events	
Organized and Educational	
Running around in the mud :)	
that they were able to interact and learn about the marsh and the environment	
the bird scavenger hunt	
The building with the animals, the boat ride, and the trails.	
The environment	
They enjoyed being outdoors.	
They learned to look at and appreciate the small things in nature...it amazed them to find out how much was going on in a pond ...and the loved the turtles and frogs	
They loved mostly everything they did that day, Especial going to the creek	
time with me	
trails	
Water related activities, games	

Table A27

Is there anything that Pickering Creek could do to improve its programs for children?	
Can't think of anything	
Continue, upgrade and advance to higher levels in providing the surrounding counties of Pickering Creek public primary and secondary school systems with educational support.	
Give the students more time at the Center.	
Great programs.	
I don't know	
I don't think so.	
I think it is a great program.	
More activities for high school age students	
No	
No! They are fantastic and the counselors are amazing!	
Not sure-- been a long time since I've been involved- and my son is now a young adult.	
not that I can see	
Not that I know of.	

Nature affinity

Table A28

		Nature affinity				
		All respondents	Audubon	Higher education	Business community	Faith community
Mean		4.17	4.53	4.07	3.93	4.09
95% CI		4.06	4.40	3.89	3.69	3.89
n		202	43	66	59	87

Values

Table A29

Egoistic values					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	5.79	5.39	5.72	6.05	5.85
95% CI	5.62 5.95	5.02 5.74	5.38 6.00	5.76 6.30	5.59 6.11
n	201	43	66	59	86

Table A30

Altruistic values					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	6.32	6.37	6.23	6.34	6.40
95% CI	6.20 6.44	6.13 6.61	6.01 6.42	6.11 6.56	6.22 6.56
n	202	43	66	59	87

Table A31

Biospheric values					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	6.31	6.60	6.19	6.16	6.18
95% CI	6.18 6.44	6.40 6.79	5.95 6.42	5.88 6.42	5.97 6.38
n	202	43	66	59	87

Salt marsh issue involvement

Table A32

How knowledgeable are you about the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	25.0%	6.8%	34.3%	32.8%	25.0%
Slightly	17.0%	4.5%	14.9%	26.2%	23.9%
Moderately	41.5%	59.1%	35.8%	29.5%	33.0%
Very	11.3%	20.5%	7.5%	8.2%	11.4%
Extremely	5.2%	9.1%	7.5%	3.3%	6.8%
n =	212	44	67	61	88

Table A33

How frequently do you think about the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	30.2%	6.8%	40.3%	44.3%	34.1%
Slightly	33.0%	31.8%	31.3%	24.6%	31.8%
Moderately	24.5%	38.6%	20.9%	24.6%	26.1%
Very	7.5%	13.6%	1.5%	6.6%	4.5%
Extremely	4.7%	9.1%	6.0%	0.0%	3.4%
n =	212	44	67	61	88

Table A34

How much do you care about the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	9.9%	2.3%	14.9%	14.8%	12.5%
Slightly	13.7%	4.5%	13.4%	21.3%	12.5%
Moderately	27.8%	18.2%	32.8%	23.0%	31.8%
Very	28.8%	43.2%	22.4%	29.5%	31.8%
Extremely	19.8%	31.8%	16.4%	11.5%	11.4%
n =	212	44	67	61	88

Sea level rise issue involvement

Table A35

How frequently do you think about sea-level rise?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	18.0%	4.5%	13.4%	36.1%	23.9%
Slightly	26.1%	29.5%	23.9%	31.1%	29.5%
Moderately	33.2%	31.8%	37.3%	21.3%	34.1%
Very	18.5%	27.3%	17.9%	11.5%	11.4%
Extremely	4.3%	6.8%	7.5%	0.0%	1.1%
n =	211	44	67	61	88

[Continued] Sea level rise issue involvement

Table A36

How much do you care about sea-level rise?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	6.2%	0.0%	4.5%	13.1%	9.1%
Slightly	13.3%	11.4%	11.9%	21.3%	20.5%
Moderately	27.5%	22.7%	31.3%	31.1%	29.5%
Very	33.6%	40.9%	28.4%	26.2%	27.3%
Extremely	19.4%	25.0%	23.9%	8.2%	13.6%
n =	211	44	67	61	88

Table A37

How knowledgeable are you about sea-level rise?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	20.9%	11.4%	13.4%	37.7%	25.0%
Slightly	26.5%	20.5%	25.4%	34.4%	26.1%
Moderately	43.1%	54.5%	49.3%	24.6%	39.8%
Very	6.6%	11.4%	9.0%	3.3%	6.8%
Extremely	2.8%	2.3%	3.0%	0.0%	2.3%
n =	211	44	67	61	88

Salt marsh communication

Table A38

Before today, how frequently had you heard the term 'salt marsh'?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	13.2%	2.3%	25.4%	16.4%	13.6%
Slightly	11.8%	6.8%	9.0%	14.8%	14.8%
Moderately	26.4%	15.9%	28.4%	27.9%	28.4%
Very	28.8%	43.2%	22.4%	19.7%	29.5%
Extremely	19.8%	31.8%	14.9%	21.3%	13.6%
n =	212	44	67	61	88

Table A39

How frequently do people you know talk about the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	43.4%	29.5%	47.8%	44.3%	40.9%
Slightly	30.7%	43.2%	26.9%	31.1%	38.6%
Moderately	19.8%	15.9%	19.4%	19.7%	13.6%
Very	3.8%	9.1%	3.0%	3.3%	4.5%
Extremely	2.4%	2.3%	3.0%	1.6%	2.3%
n =	212	44	67	61	88

Table A40

How frequently do you talk about the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Not at all	42.5%	18.2%	44.8%	54.1%	46.6%
Slightly	33.0%	50.0%	28.4%	24.6%	34.1%
Moderately	17.9%	18.2%	20.9%	16.4%	11.4%
Very	3.8%	11.4%	3.0%	3.3%	5.7%
Extremely	2.8%	2.3%	3.0%	1.6%	2.3%
n =	212	44	67	61	88

Salt marsh and sea level rise knowledge

Table A41

What is a salt marsh?					
	All respondents	Audubon	Higher education	Business community	Faith community
A type of wetland	8.0%	2.3%	9.0%	9.8%	12.5%
A transition between land and ocean or bay systems	6.1%	6.8%	6.0%	4.9%	5.7%
A harsh environment where plants and animals are adapted to survive in tidal and saline conditions	3.3%	2.3%	4.5%	3.3%	3.4%
***All of the above	65.6%	86.4%	55.2%	55.7%	58.0%
Don't know	17.0%	2.3%	25.4%	26.2%	20.5%
n =	212	44	67	61	88

***Correct response

Table A42

Which is not one of the functions of the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Provide habitat for migrating and breeding birds	1.9%	2.3%	1.5%	0.0%	0.0%
***Provide nurseries for endangered shark species	59.4%	79.5%	47.8%	59.0%	58.0%
Purify water	11.3%	9.1%	13.4%	8.2%	10.2%
Provide erosion and flood control	2.4%	2.3%	3.0%	1.6%	4.5%
Don't know	25.0%	6.8%	34.3%	31.1%	27.3%
n =	212	44	67	61	88

***Correct response

Table A43

What is the Atlantic Flyway?					
	All respondents	Audubon	Higher education	Business community	Faith community
A type of bird mating behavior	1.4%	0.0%	1.5%	0.0%	1.1%
***A migratory path for birds	72.2%	97.7%	61.2%	60.7%	68.2%
A runway at Baltimore's airport	.5%	2.3%	0.0%	0.0%	0.0%
An air circulation pattern	.9%	0.0%	1.5%	0.0%	1.1%
Don't know	25.0%	0.0%	35.8%	39.3%	29.5%
n =	212	44	67	61	88

***Correct response

Table A44

Which is not threatening the salt marshes?					
	All respondents	Audubon	Higher education	Business community	Faith community
Sea level rise	8.5%	11.4%	4.5%	9.8%	8.0%
***Addition of soils	44.5%	54.5%	46.3%	29.5%	40.9%
Climate change	4.3%	9.1%	0.0%	9.8%	2.3%
Invasive species	3.3%	0.0%	4.5%	3.3%	4.5%
Don't know	39.3%	25.0%	44.8%	47.5%	44.3%
n =	211	44	67	61	88

***Correct response

Table A45

How fast have sea levels been rising in comparison to Maryland's coastline in the last 10 years, if at all?					
	All respondents	Audubon	Higher education	Business community	Faith community
Sea levels have not been rising	.5%	0.0%	0.0%	0.0%	0.0%
Less than 1/4 of an inch a year	7.6%	9.1%	10.4%	6.6%	5.7%
***Between 1/4 to 1/3 of an inch a year	12.3%	15.9%	16.4%	3.3%	9.1%
Between 1/2 to 2/3 of an inch a year	14.7%	15.9%	7.5%	13.1%	12.5%
A foot or more a year	2.8%	6.8%	3.0%	1.6%	2.3%
Don't know	62.1%	52.3%	62.7%	75.4%	70.5%
n =	211	44	67	61	88

***Correct response

[Continued] Salt marsh and sea level rise knowledge

Table A46

	Correct knowledge scores				
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	2.51	3.35	2.29	2.07	2.36
95% CI	2.30	3.00	1.91	1.66	2.02
n	202	43	66	59	87

Climate change certainty

Table A47

	Do you think that climate change is currently happening? How sure are you that climate change is happening/not happening?				
	All respondents	Audubon	Higher education	Business community	Faith community
Extremely sure that climate change is not happening	.9%	0.0%	0.0%	3.3%	2.3%
Very sure that climate change is not happening	2.8%	0.0%	3.0%	4.9%	4.5%
Somewhat sure that climate change is not happening	1.4%	0.0%	1.5%	1.6%	1.1%
Not at all sure that climate change is not happening	.5%	0.0%	1.5%	0.0%	1.1%
Don't know	5.7%	11.4%	7.5%	6.6%	6.8%
Not at all sure that climate change is happening	2.4%	0.0%	0.0%	6.6%	4.5%
Somewhat sure that climate change is happening	17.1%	11.4%	17.9%	26.2%	18.2%
Very sure that climate change is happening	28.0%	25.0%	25.4%	26.2%	30.7%
Extremely sure that climate change is happening	41.2%	52.3%	43.3%	24.6%	30.7%
n =	211	44	67	61	88

Sea level rise certainty

Table A48

Do you think that sea-level rise is currently happening along Maryland's coastlines? How sure are you that sea-level rise is happening/not happening along Maryland's coastlines?					
	All respondents	Audubon	Higher education	Business community	Faith community
Extremely sure that sea level rise is not happening along Maryland's coastlines	0.0%	0.0%	0.0%	0.0%	0.0%
Very sure that sea level rise is not happening along Maryland's coastlines	.5%	0.0%	0.0%	1.6%	0.0%
Somewhat sure that sea level rise is not happening along Maryland's coastlines	1.9%	0.0%	0.0%	3.3%	3.4%
Not at all sure that sea level rise is not happening along Maryland's coastlines	1.4%	0.0%	0.0%	1.6%	2.3%
Don't know	10.9%	9.1%	13.4%	21.3%	15.9%
Not at all sure that sea level rise is happening along Maryland's coastlines	4.7%	0.0%	1.5%	13.1%	5.7%
Somewhat sure that sea level rise is happening along Maryland's coastlines	32.2%	25.0%	37.3%	29.5%	33.0%
Very sure that sea level rise is happening along Maryland's coastlines	24.2%	20.5%	23.9%	14.8%	23.9%
Extremely sure that sea level rise is currently happening along Maryland's coastlines	24.2%	45.5%	23.9%	14.8%	15.9%
n =	211	44	67	61	88

Climate change causation

Table A49

What do you think is causing climate change?					
	All respondents	Audubon	Higher education	Business community	Faith community
Caused entirely by human activities	13.6%	11.4%	15.9%	9.1%	7.5%
Caused mostly by human activities	44.2%	50.0%	55.6%	30.9%	43.8%
Caused about equally by human activities and natural changes in the environment	25.6%	20.5%	17.5%	32.7%	27.5%
Caused mostly by natural changes in the environment	6.5%	11.4%	1.6%	7.3%	7.5%
Caused entirely by natural changes in the environment	1.0%	2.3%	1.6%	0.0%	1.3%
Don't know	9.0%	4.5%	7.9%	20.0%	12.5%
n =	199	44	63	55	80

Perceptions of social and scientific consensus

Table A50

Again, to the best of your knowledge, what percentage of the following people think climate change is happening?						
		All respondents	Audubon	Higher education	Business community	Faith community
People in my community	0-20%	17.1%	14.0%	19.4%	20.3%	22.1%
	21-40%	21.5%	27.9%	28.4%	18.6%	19.8%
	41-60%	30.2%	27.9%	23.9%	32.2%	27.9%
	61-80%	23.9%	23.3%	23.9%	20.3%	24.4%
	81-100%	7.3%	7.0%	4.5%	8.5%	5.8%
	n =	205	43	67	59	86
Maryland's Eastern Shore residents	0-20%	10.2%	9.3%	10.4%	11.9%	12.8%
	21-40%	21.5%	23.3%	23.9%	22.0%	24.4%
	41-60%	33.2%	32.6%	34.3%	35.6%	29.1%
	61-80%	28.3%	30.2%	28.4%	22.0%	26.7%
	81-100%	6.8%	4.7%	3.0%	8.5%	7.0%
	n =	205	43	67	59	86
Maryland residents (statewide)	0-20%	10.7%	11.6%	11.9%	10.2%	15.1%
	21-40%	24.9%	34.9%	28.4%	22.0%	24.4%
	41-60%	35.1%	41.9%	31.3%	32.2%	36.0%
	61-80%	23.9%	9.3%	23.9%	27.1%	18.6%
	81-100%	5.4%	2.3%	4.5%	8.5%	5.8%
	n =	205	43	67	59	86
Climate scientists	0-20%	1.9%	0.0%	3.0%	0.0%	3.5%
	21-40%	4.4%	0.0%	7.5%	5.1%	2.3%
	41-60%	7.8%	11.4%	10.4%	6.8%	8.1%
	61-80%	16.0%	20.5%	13.4%	16.9%	18.6%
	81-100%	69.9%	68.2%	65.7%	71.2%	67.4%
	n =	206	44	67	59	86

Table A51

To the best of your knowledge, what percentage of the following people think sea-level rise is happening along Maryland's coastlines?						
		All respondents	Audubon	Higher education	Business community	Faith community
People in my community	0-20%	28.6%	27.9%	26.9%	30.5%	31.4%
	21-40%	22.8%	18.6%	29.9%	25.4%	23.3%
	41-60%	23.3%	27.9%	19.4%	23.7%	23.3%
	61-80%	19.4%	20.9%	19.4%	13.6%	16.3%
	81-100%	5.8%	4.7%	4.5%	6.8%	5.8%
	n =	206	43	67	59	86
Maryland's Eastern Shore residents	0-20%	11.2%	9.3%	10.4%	15.3%	12.8%
	21-40%	22.3%	23.3%	25.4%	23.7%	23.3%
	41-60%	27.2%	20.9%	29.9%	32.2%	31.4%
	61-80%	29.6%	30.2%	29.9%	22.0%	24.4%
	81-100%	9.7%	16.3%	4.5%	6.8%	8.1%
	n =	206	43	67	59	86
Maryland residents (statewide)	0-20%	21.4%	25.6%	16.4%	27.1%	25.6%
	21-40%	30.1%	30.2%	38.8%	23.7%	24.4%
	41-60%	32.5%	34.9%	25.4%	33.9%	38.4%
	61-80%	11.7%	7.0%	16.4%	8.5%	8.1%
	81-100%	4.4%	2.3%	3.0%	6.8%	3.5%
	n =	206	43	67	59	86
Scientists	0-20%	4.4%	0.0%	3.0%	8.6%	4.7%
	21-40%	4.4%	6.8%	9.0%	0.0%	3.5%
	41-60%	8.3%	6.8%	7.5%	12.1%	10.6%
	61-80%	21.8%	20.5%	25.4%	20.7%	23.5%
	81-100%	61.2%	65.9%	55.2%	58.6%	57.6%
	n =	206	44	67	58	85

Civic and issue communication opinion leadership

Table A52

Conservation communication opinion leadership scale					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	14.21	14.65	15.07	12.92	13.80
95% CI	13.73	13.65	14.27	12.00	13.10
n	186	43	59	52	81

Table A53

Influentials -- 3 or more civic actions in the past year					
	All respondents	Audubon	Higher education	Business community	Faith community
Not an influential	43.2%	46.5%	28.4%	59.0%	42.0%
Roper ASW's Influentials (3 or more civic actions in past year)	56.8%	53.5%	71.6%	41.0%	58.0%
n =	206	43	67	61	88

Table A54

Number of civic actions (Maximum 11 possible)					
	All respondents	Audubon	Higher education	Business community	Faith community
Mean	4.50	3.88	6.67	2.90	4.34
95% CI	3.97	2.98	5.72	2.18	3.67
n	201	42	66	59	87

Table A55

Combined civic and natural resources communication opinion leadership					
	All respondents	Audubon	Higher education	Business community	Faith community
0-1 leadership categories	75.0%	69.8%	68.3%	88.7%	78.0%
Combined leadership categories	25.0%	30.2%	31.7%	11.3%	22.0%
n =	188	43	60	53	82

Blackwater National Wildlife Refuge Program Participation Data

Appendix B

Participant gender

Table B1

What is your gender?		%
Male		37.8
Female		62.2
n =		217

Familiarity with programming and BNWF

Table B2

Have you participated in a "Salt Marsh Stories" educational presentation by Pickering Creek?			
	All participants	Audubon participants	Higher education participants
No	71.5%	78.7%	68.8%
Yes — I saw the talk this year	12.7%	10.6%	13.5%
Yes — I have seen the talk in previous years	5.0%	4.3%	5.3%
Don't know	8.1%	2.1%	10.0%
n =	221	47	170

*Totals may not total 100%; respondents may choose multiple answers.

Table B3

Have you visited Blackwater National Wildlife Refuge before today?			
	All participants	Audubon participants	Higher education participants
No	52.5%	21.3%	61.2%
Yes — With Pickering Creek Audubon Center	8.6%	8.5%	8.2%
Yes — With another organization	10.0%	14.9%	8.2%
Yes — On my own	29.9%	68.1%	18.8%
Don't know	4.1%	0.0%	5.3%
n =	221	47	170

*Totals may not total 100%; respondents may choose multiple answers.

Group cohesion

Table B4

How familiar are you with the other people who participated in the program today?			
	All participants	Audubon participants	Higher education participants
Not at all	11.9%	32.6%	5.3%
A little	15.1%	26.1%	11.2%
Somewhat	42.5%	21.7%	49.1%
Very	22.8%	10.9%	26.6%
Extremely	7.8%	8.7%	7.7%
n =	219	46	169

Table B5

How strong is your feeling of belonging to the people in the group today?			
	All participants	Audubon participants	Higher education participants
Not at all	2.7%	4.3%	2.4%
A little	10.5%	17.0%	8.3%
Somewhat	32.3%	36.2%	31.4%
Very	34.5%	25.5%	36.7%
Extremely	20.0%	17.0%	21.3%
n =	220	47	169

Table B6

How close do you feel to the people in your group today?			
	All participants	Audubon participants	Higher education participants
Not at all	3.2%	2.1%	3.6%
A little	12.3%	17.0%	10.7%
Somewhat	37.9%	46.8%	35.7%
Very	29.2%	14.9%	32.7%
Extremely	17.4%	19.1%	17.3%
n =	219	47	168

Overall program satisfaction

Table B7

I feel very good about my experiences today.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	.5%	0.0%	.6%
Neutral	3.7%	0.0%	4.8%
Somewhat agree	11.5%	2.1%	14.3%
Strongly agree	83.5%	97.9%	79.2%
n =	218	47	168

Table B8

I am satisfied with Pickering Creek Audubon Center's program today.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.5%	0.0%	.6%
Somewhat disagree	.5%	0.0%	.6%
Neutral	5.0%	2.1%	6.0%
Somewhat agree	7.8%	0.0%	10.1%
Strongly agree	86.2%	97.9%	82.7%
n =	218	47	168

Table B9

I enjoyed Blackwater National Wildlife Refuge.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	0.0%	0.0%	0.0%
Neutral	4.1%	0.0%	5.4%
Somewhat agree	11.1%	6.4%	12.6%
Strongly agree	83.9%	93.6%	80.8%
n =	217	47	167

Program content assessment

Table B10

The program was interesting.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	.9%	0.0%	1.2%
Neutral	3.7%	0.0%	4.8%
Somewhat agree	20.3%	8.5%	24.0%
Strongly agree	74.2%	91.5%	68.9%
n =	217	47	167

Table B11

The program was well-organized.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.5%	0.0%	.6%
Somewhat disagree	.5%	0.0%	.6%
Neutral	3.7%	0.0%	4.8%
Somewhat agree	19.3%	6.4%	23.2%
Strongly agree	76.1%	93.6%	70.8%
n =	218	47	168

Table B12

The program was stimulating.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	1.8%	0.0%	2.4%
Neutral	7.4%	2.1%	9.0%
Somewhat agree	19.4%	10.6%	21.6%
Strongly agree	70.5%	87.2%	65.9%
n =	217	47	167

Program staff assessment

Table B13

The staff were knowledgeable.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.5%	0.0%	.6%
Somewhat disagree	.5%	0.0%	.6%
Neutral	2.3%	0.0%	3.0%
Somewhat agree	9.6%	2.1%	11.9%
Strongly agree	87.2%	97.9%	83.9%
n =	218	47	168

Table B14

The staff were responsive to participant needs and questions.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	0.0%	0.0%	0.0%
Neutral	1.8%	0.0%	2.4%
Somewhat agree	9.2%	2.1%	11.3%
Strongly agree	88.1%	97.9%	85.1%
n =	218	47	168

Table B15

The staff did a good job in making it a fun day for me.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	.9%	0.0%	1.2%
Neutral	2.3%	0.0%	3.0%
Somewhat agree	14.7%	2.1%	18.6%
Strongly agree	81.1%	97.9%	76.0%
n =	217	47	167

Program repeat participation

Table B16

I would participate in this program again.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	1.8%	0.0%	2.4%
Somewhat disagree	1.4%	0.0%	1.8%
Neutral	6.9%	2.1%	8.3%
Somewhat agree	22.0%	10.6%	25.6%
Strongly agree	67.9%	87.2%	61.9%
n =	218	47	168

Table B17

I will recommend this program to other people.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	1.4%	0.0%	1.8%
Somewhat disagree	1.4%	0.0%	1.8%
Neutral	7.8%	2.1%	9.5%
Somewhat agree	16.5%	8.5%	19.0%
Strongly agree	72.9%	89.4%	67.9%
n =	218	47	168

Program recommendations

Table B18

I will say positive things about this program to other people.			
	All participants	Audubon participants	Higher education participants
Strongly disagree	.9%	0.0%	1.2%
Somewhat disagree	1.4%	0.0%	1.8%
Neutral	3.2%	0.0%	4.2%
Somewhat agree	13.3%	6.4%	15.5%
Strongly agree	81.2%	93.6%	77.4%
n =	218	47	168

Participant descriptions of program

Table B19

If you were to tell a friend about your day today, what would you say? (Coded from open ended responses.)	
Fun/great time	41%
Planted marsh grass/trees/etc.	23%
Engage(d) in environmental conservation	22%
Dirty/muddy	17%
Educational	17%
Great people	11%
Beautiful	7%
Cold/wet	5%
Saw wildlife	5%
Importance of salt marshes/BNWR	5%
Climate change	1%
n = 190	

Emotional responses

Table B20

		Please tell us whether you felt the following emotions or reactions during the day.		
		All participants	Audubon participants	Higher education participants
Happy	No	3.2%	0.0%	4.2%
	Yes	96.8%	100.0%	95.8%
	n =	218	47	168
Energetic	No	13.8%	6.4%	16.2%
	Yes	86.2%	93.6%	83.8%
	n =	218	47	167
Excited	No	11.5%	8.5%	11.4%
	Yes	88.5%	91.5%	88.6%
	n =	217	47	166
Bored	No	91.1%	100.0%	88.3%
	Yes	8.9%	0.0%	11.7%
	n =	214	47	163
Angry	No	98.6%	100.0%	98.8%
	Yes	1.4%	0.0%	1.2%
	n =	214	46	164
Annoyed	No	94.9%	100.0%	93.3%
	Yes	5.1%	0.0%	6.7%
	n =	214	47	163
Motivated	No	7.3%	2.1%	8.9%
	Yes	92.7%	97.9%	91.1%
	n =	219	47	168
Inspired	No	15.6%	6.4%	18.0%
	Yes	84.4%	93.6%	82.0%
	n =	218	47	167
Humbled	No	21.1%	34.1%	17.0%
	Yes	78.9%	65.9%	83.0%
	n =	213	44	165
Sad	No	89.8%	93.6%	89.1%
	Yes	10.2%	6.4%	10.9%
	n =	216	47	165
Depressed	No	95.3%	100.0%	94.5%
	Yes	4.7%	0.0%	5.5%
	n =	213	46	163
Dejected	No	97.7%	100.0%	96.9%
	Yes	2.3%	0.0%	3.1%
	n =	214	47	163
Surprised	No	44.7%	54.3%	41.2%
	Yes	55.3%	45.7%	58.8%
	n =	215	46	165
Amazed	No	33.6%	46.7%	29.7%
	Yes	66.4%	53.3%	70.3%
	n =	214	45	165
Entertained	No	13.0%	13.3%	12.0%
	Yes	87.0%	86.7%	88.0%
	n =	215	45	166
Awestruck	No	44.5%	57.8%	40.5%
	Yes	55.5%	42.2%	59.5%
	n =	211	45	163
Shocked	No	65.3%	84.4%	60.4%
	Yes	34.7%	15.6%	39.6%
	n =	213	45	164
Breathtaking	No	47.1%	63.6%	42.6%
	Yes	52.9%	36.4%	57.4%
	n =	210	44	162

Place attachment to Blackwater National Wildlife Refuge

Table B21

Place attachment to Blackwater National Wildlife Refuge				
		All participants	Audubon participants	Higher education participants
I have negative feelings for this place.	False	99.5%	100.0%	99.4%
	True	.5%	0.0%	.6%
	n =	219	47	169
I have no particular feelings for this place.	False	87.6%	100.0%	84.0%
	True	12.4%	0.0%	16.0%
	n =	218	47	169
I do not think of myself as being from this place.	False	37.6%	28.9%	40.0%
	True	62.4%	71.1%	60.0%
	n =	213	45	165
I have an emotional attachment to this place -- it has meaning to me.	False	34.9%	19.6%	39.8%
	True	65.1%	80.4%	60.2%
	n =	215	46	166
I am willing to invest my talent or time to make this an even better place. [Blackwater National Wildlife Refuge]	False	17.5%	4.3%	21.6%
	True	82.5%	95.7%	78.4%
	n =	217	47	167
I am willing to make financial sacrifices for the sake of this place.	False	58.0%	52.3%	60.0%
	True	42.0%	47.7%	40.0%
	n =	212	44	165

Table B22

Place attachment to Blackwater National Wildlife Refuge			
	All participants	Audubon participants	Higher education participants
Mean	4.12	4.51	4.01
95% CI	3.94	4.20	3.77
	4.33	4.81	4.23
n	201	41	158

Nature affinity

Table B23

Nature affinity			
	All participants	Audubon participants	Higher education participants
Mean	4.26	4.60	4.16
95% CI	4.15	4.44	4.04
	4.36	4.72	4.27
n	218	47	168

Salt marsh and sea level rise knowledge

Table B24

What is a salt marsh?			
	All participants	Audubon participants	Higher education participants
A type of wetland	9.1%	6.4%	10.1%
A transition between land and ocean or bay systems	4.1%	2.1%	4.7%
A harsh environment where plants and animals are adapted to survive in tidal and saline conditions	5.9%	6.4%	5.9%
***All of the above	76.7%	80.9%	75.1%
Don't know	4.1%	4.3%	4.1%
n =	219	47	169

***Correct response

[Continued] Salt marsh and sea level rise knowledge

Table B25

Which is not one of the functions of the salt marshes?			
	All participants	Audubon participants	Higher education participants
Provide habitat for migrating and breeding birds	1.4%	0.0%	1.8%
***Provide nurseries for endangered shark species	68.5%	85.1%	63.3%
Purify water	16.0%	8.5%	18.3%
Provide erosion and flood control	4.1%	2.1%	4.7%
Don't know	10.0%	4.3%	11.8%
n =	219	47	169

***Correct response

Table B26

What is the Atlantic Flyway?			
	All participants	Audubon participants	Higher education participants
A type of bird mating behavior	2.7%	2.1%	3.0%
***A migratory path for birds	79.5%	91.5%	75.7%
A runway at Baltimore's airport	.9%	0.0%	1.2%
An air circulation pattern	.5%	0.0%	.6%
Don't know	16.4%	6.4%	19.5%
n =	219	47	169

***Correct response

Table B27

Which is not threatening the salt marshes?			
	All participants	Audubon participants	Higher education participants
Sea level rise	.9%	0.0%	1.2%
***Addition of soils	84.4%	80.9%	85.1%
Climate change	1.8%	2.1%	1.8%
Invasive species	2.8%	6.4%	1.8%
Don't know	10.1%	10.6%	10.1%
n =	218	47	168

***Correct response

Table B28

How fast have sea levels been rising in comparison to Maryland's coastline in the last 10 years, if at all?			
	All participants	Audubon participants	Higher education participants
Sea levels have not been rising	.5%	0.0%	.6%
Less than 1/4 of an inch a year	3.7%	4.3%	3.0%
***Between 1/4 to 1/3 of an inch a year	27.2%	29.8%	26.9%
Between 1/2 to 2/3 of an inch a year	21.2%	23.4%	20.4%
A foot or more a year	2.8%	2.1%	3.0%
Don't know	44.7%	40.4%	46.1%
n =	217	47	167

***Correct response

Table B29

Average number of correct answers			
	All participants	Audubon participants	Higher education participants
Mean	3.33	3.68	3.24
95% CI	3.15	3.34	3.04
n	221	47	170

Climate change and sea level rise certainty and causation

Table B30

Do you think that climate change is currently happening? How sure are you that climate change is happening/not happening?			
	All participants	Audubon participants	Higher education participants
Extremely sure that climate change is not happening	0.0%	0.0%	0.0%
Very sure that climate change is not happening	1.4%	0.0%	1.9%
Somewhat sure that climate change is not happening	0.0%	0.0%	0.0%
Not at all sure that climate change is not happening	0.0%	0.0%	0.0%
Don't know	5.7%	2.2%	6.8%
Not at all sure that climate change is happening	1.9%	0.0%	2.5%
Somewhat sure that climate change is happening	13.8%	11.1%	14.9%
Very sure that climate change is happening	22.9%	24.4%	21.7%
Extremely sure that climate change is happening	54.3%	62.2%	52.2%
n =	210	45	161

Table B31

Do you think that sea-level rise is currently happening along Maryland's coastlines? How sure are you that sea-level rise is happening/not happening along Maryland's coastlines?			
	All participants	Audubon participants	Higher education participants
Extremely sure that sea level rise is not happening along Maryland's coastlines	0.0%	0.0%	0.0%
Very sure that sea level rise is not happening along Maryland's coastlines	.5%	0.0%	.6%
Somewhat sure that sea level rise is not happening along Maryland's coastlines	0.0%	0.0%	0.0%
Not at all sure that sea level rise is not happening along Maryland's coastlines	0.0%	0.0%	0.0%
Don't know	6.0%	2.1%	7.2%
Not at all sure that sea level rise is happening along Maryland's coastlines	3.7%	0.0%	4.2%
Somewhat sure that sea level rise is happening along Maryland's coastlines	15.7%	12.8%	16.9%
Very sure that sea level rise is happening along Maryland's coastlines	27.8%	19.1%	30.7%
Extremely sure that sea level rise is currently happening along Maryland's coastlines	46.3%	66.0%	40.4%
n =	216	47	166

Table B35

What do you think is causing climate change?			
	All participants	Audubon participants	Higher education participants
Caused entirely by human activities	7.4%	8.9%	7.1%
Caused mostly by human activities	56.4%	55.6%	56.1%
Caused about equally by human activities and natural changes in the environment	29.4%	31.1%	29.0%
Caused mostly by natural changes in the environment	2.5%	2.2%	2.6%
Caused entirely by natural changes in the environment	1.5%	0.0%	1.9%
Don't know	2.9%	2.2%	3.2%
n =	204	45	155

Understanding the effects of sea level rise on the salt marshes

Table B36

Please tell us about what effect, if any, you think that sea level rise is having on the salt marshes in Blackwater National Wildlife Refuge. (Coded from open ended responses.)	
Loss/movement of salt marsh	56%
Loss of species/habitat	23%
Loss of trees	12%
Erosion	9%
Bad/negative effect	8%
Salinity change	6%
Don't know	4%
Climate change	3%
n = 178	

Salt marsh issue involvement and communication

Table B37

How much do you care about the salt marshes?			
	All participants	Audubon participants	Higher education participants
Not at all	2.3%	0.0%	3.0%
Slightly	12.0%	4.4%	14.4%
Moderately	39.8%	28.9%	43.1%
Extremely	45.8%	66.7%	39.5%
n =	216	45	167

Table B38

How knowledgeable are you about the salt marshes?			
	All participants	Audubon participants	Higher education participants
Not at all	7.9%	6.5%	8.4%
Slightly	36.1%	30.4%	37.3%
Moderately	43.5%	54.3%	41.0%
Extremely	12.5%	8.7%	13.3%
n =	216	46	166

Table B39

How likely is it that you will talk about the salt marshes with friends and neighbors after today's program?			
	All participants	Audubon participants	Higher education participants
Not at all	9.3%	6.5%	10.2%
Slightly	21.8%	13.0%	24.1%
Moderately	40.7%	45.7%	40.4%
Extremely	28.2%	34.8%	25.3%
n =	216	46	166

Sea level rise issue involvement

Table B40

How much do you care about sea-level rise?			
	All participants	Audubon participants	Higher education participants
Not at all	1.4%	0.0%	1.8%
Slightly	9.2%	4.3%	10.8%
Moderately	40.6%	34.8%	41.9%
Extremely	48.8%	60.9%	45.5%
n =	217	46	167

Table B41

How knowledgeable are you about sea-level rise?			
	All participants	Audubon participants	Higher education participants
Not at all	4.6%	8.7%	3.6%
Slightly	32.4%	23.9%	34.3%
Moderately	50.9%	54.3%	50.0%
Extremely	12.0%	13.0%	12.0%
n =	216	46	166

Sea level rise issue communication

Table B42

How likely is it that you will talk about sea-level rise with friends and neighbors after today's program?			
	All participants	Audubon participants	Higher education participants
Not at all	11.5%	4.3%	13.2%
Slightly	26.3%	23.9%	27.5%
Moderately	40.1%	43.5%	39.5%
Extremely	22.1%	28.3%	19.8%
n =	217	46	167

