Bay Protectors for Shoreline Management: Implementation Plan
Chesapeake Bay Program

action
RESEARCH

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Acknowledgements

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Purpose

The goal of this work is ultimately to improve the health of the Chesapeake Bay and its tributaries by reducing excessive shoreline erosion, preventing sediment, nitrogen, and phosphorus pollution, creating healthier ecosystems, and mitigating the impacts of climate change.

Action Research was contracted to assist in achieving this goal using a behavior-based approach called community-based social marketing. The process utilized the following data sources: a literature review; a survey of shoreline management experts; and a survey of Maryland and Virginia shoreline property owners. In addition, a steering committee of shoreline and communication experts was assembled to provide oversight and expertise. The research results were used to design strategies and materials to help shoreline property owners in the Chesapeake Bay better manage their shorelines. Targeted behaviors included: (1) remove shoreline armor; (2) leave their natural shorelines alone; (3) plant upland vegetation; and (4) where applicable, install living shorelines.

Community-Based Social Marketing

Community-based social marketing (CBSM) is a best practice methodology to achieve lasting, quantifiable behavior change. It offers a research and evidence-based alternative to traditional education campaigns (McKenzie-Mohr, 1996; 1999; 2000; 2011; McKenzie-Mohr, Lee, Schultz, & Kotler, 2011; Schultz & Tabanico, 2007). CBSM is based upon research in the social sciences that demonstrates that behavior change is most effectively achieved through initiatives delivered at the community level that focus on removing barriers to an activity while simultaneously enhancing the activity's benefits.

CBSM brings together knowledge from the field of social marketing with a variety of behavior change "tools" drawn from social psychology, environmental psychology, and other social sciences. CBSM involves five steps:

1. Selecting which behaviors to target;
2. Identifying the barriers and benefits to the selected behavior;
3. Developing a strategy that reduces the barriers to the behavior to be promoted, while simultaneously increasing the behavior's perceived benefits;
4. Piloting the strategy; and,
5. Broad scale implementation and ongoing evaluation once the strategy has been broadly implemented.

Step 1: Behavior Selection

A successful behavior change campaign must both (a) target behaviors that are linked to the desired outcome or goal, and (b) target specific behaviors rather than make broad appeals (e.g., save the Bay). Even within a single sector (e.g., shoreline property owners), there are numerous shoreline management behaviors that residents could engage in.

The CBSM approach focused on selecting concrete behaviors followed by a careful analysis of four specific impacts: (1) excessive erosion; (2) water quality; (3) habitat; and (4) climate change resiliency. Additionally, data was collected from shoreline property owners on their existing level of engagement in the target behaviors (penetration), their likelihood of behavior change (probability), and the relevance of the behavior across the target audience (applicability).

Target Audience

The target audience for this work was residential shoreline property owners along the Chesapeake Bay. Research was conducted in both Maryland and Virginia. No significant differences were found between property owners by state of residence. Therefore, the results should be applicable across shoreline property owners in the Chesapeake Bay.

Preliminary Behavior List

The first step in the behavior selection process involved a literature review and meeting with the steering committee to identify shoreline management behaviors of interest. These behaviors are listed below.

Shoreline Management Behavior List

1. Leave an unarmored shoreline alone - let it erode, accrete, or stay neutral.
2. Install beach nourishment (non-structural).
3. Install armor – groins with no vegetative component (structural).
4. Install armor – jetties with no vegetative component (structural).
5. Install armor – breakwater with no vegetative component (structural).
6. Install armor – revetment with no vegetative component (structural).
7. Install buffer (upland/riparian) vegetation.
8. Install living shoreline (LS) – jetties/groins with wetland vegetation (structural).
9. Install living shoreline (LS) – offshore breakwater with wetland vegetation (hybrid).
10. Install living shoreline (LS) – sills with wetland vegetation (hybrid).
11. Install living shoreline (LS) – slope grading/vegetation (non-structural).

Measuring Impact, Penetration, Probability, and Applicability

Impact

To measure impact, experts were asked to rate each behavior on its potential impact on excessive erosion, water quality, habitat, and climate change resiliency (defined in Table 1). These impacts were rated on a 0 to 10 scale, with "0" being no impact and "10" being high impact. The participants were asked to assume the behavior was implemented on a shoreline where the management technique was appropriate. The final section focused on other methods of shoreline management and requested data about how many properties can likely take these different actions. Fifteen experts completed the survey.

Table 1: Definition of Impact Types

Impact Type	Definition
Excessive Erosion	Property loss or infrastructure damage caused by or resulting from water and/or wind
Water Quality	Preventing excessive nitrogen, phosphorus, and sediment from entering the watershed
Habitat	Increasing the amount of ecosystem area for birds, fish, and other wildlife
Climate Change Resiliency	Increasing the ability of the shoreline to adjust over time to climate changes and continue providing ecosystem services

Impact scores for each behavior were averaged. The standardized impact score for each behavior is presented in the Weight Tables section, Table 2.

Applicability

Applicability is the proportion of the population that can possibly take the action, rated from 0 to 1. For example, if only half the population has a property that is suited for the particular shoreline management behavior, it would receive a rating of .5 (or 50%). Shoreline management, particularly in the context of excessive erosion, consists of a highly context-dependent set of actions. While we identified eleven distinct behaviors, shoreline experts have emphasized that any installation on a specific property must be chosen based on a variety of contextual factors and designed by an expert to be effective.

In discussions with the steering committee, fetch (wave energy) and the resulting erosion rate were suggested to approximate applicability. Living shorelines and leaving the shoreline alone likely need lower baseline erosion rates to be potentially appropriate techniques, while armoring can be installed at higher baseline erosion rates. According to Maryland Department of Natural Resources, more than half of the state's shoreline (87%) has slight (0 to -2 feet a year) or less erosion, and the majority of Virginia shorelines have an average of less than -1.5 ft/year of erosion, which would likely allow for the installation of a living shoreline or that the shoreline can be left alone.

Therefore, the action of planting upland vegetation was rated a "1" for applicability (the vast majority of properties could engage), while all others were rated a ".8" (80% of properties could engage).

Probability and Penetration

Probability

Probability was determined using a mail survey of shoreline residents. Respondents were asked how likely they were to install various shoreline erosion management structures (if they did not already have them) using a scale from 0 (not at all) to 10 (extremely likely). Responses were averaged and entered into the weight table.

Penetration

Penetration, or the extent to which individuals are already engaged in each action, was meant to be assessed in the mail survey. However, the question was misunderstood by participants, and therefore not used in the final weighting formula.

Weight Tables

The mean ratings for impact, probability, and applicability were multiplied together to create a "weight" for each behavior. The weight allows for behavior prioritization. Weights could range from 0 to 100. The higher the weight, the higher the priority.

Weight = impact * probability * applicability.

Table 2: Ranked Behaviors for Further Research

Behavior	Impact[1]	Penetration	Probability	Applicability	Weight
Plant buffer (upland/riparian) vegetation	7.39	-	2.72	1	20.12
Install Living Shoreline - wetland vegetation	7.87	-	1.47	0.8	9.26
Install Living Shoreline with sills	8.20	-	0.77	0.8	5.06
Leave an unarmored shoreline alone	3.47	-	1	0.8	2.78
Install Living Shoreline with jetties/groins	7.80	-	0.4	0.8	2.50
Install Living Shoreline with offshore breakwater	7.94	-	0.39	0.8	2.48

Conclusions

The final weight calculations ranged from 2.48 to 20.12. *Installation of upland vegetation* received the highest weight, followed by *installing living shorelines* and *installing living shorelines with sills*. *Leaving an unarmored shoreline alone* and *installing living shorelines with jetties/groins* or *with an offshore breakwater* were at the bottom of the list. It is important to note that there was significant disagreement between experts on the impact of not armoring a shoreline, where some experts rated it as having a high impact and other experts rated it as having no impact.

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[1] Impact = (Erosion*.25) + (Water Quality*.25) + (Habitat*.25) + (Climate Resiliency*.25)

Step 2: Barrier and Benefit Research

In February and March of 2020, a mail survey was administered to 1,600 shoreline property owners along the Chesapeake Bay in Maryland and Virginia. The survey was designed to gather generalizable barrier and benefit information from shoreline property owners in the region. Addresses were randomly selected from a list of all shoreline properties in Maryland and Virginia using state-level GIS data.

Method

The mail survey was administered following the Tailored Design Method (TDM)[2]. In February 2020, selected properties received a prenotification postcard followed a few days later by a hand-addressed survey packet with an addressed and stamped return envelope. In March 2020, non-respondents to the initial mailing received a reminder postcard followed by a second survey packet.

Materials

The survey packet included a booklet with a cover letter and the questions, and a color photo reference sheet showing various shoreline management techniques.

Results

A selection of the final sample characteristics is displayed below followed by notable findings. The full report is available in *Survey Results – Shoreline Management Barriers and Benefits.*

Sample

Participant Characteristics	
Ownership:	Own (98%); Rent (2%)
Length Ownership:	Average: 20 years, Range: 1 to 85 years
Age:	Mean = 62; Range 26 – 94
Structures:	House (91.7%), Other Building (32.1%), Vacation/rental home (8.9%), Dock (62.2%)
Armored Shoreline:	Yes (68.8%), No (32.2%)

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[2] Dillman, Don A., Smyth, Jolene D., Christian, Leah Melani. 2014. Internet, Phone, Mail and Mixed-Mode Surveys: The Tailored Design Method, 4th edition. John Wiley: Hoboken, NJ

Installing a Living Shoreline

To assess barriers to installing a living shoreline on their property, respondents were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

Figure 1: Ranked Barriers to Installing a Living Shoreline

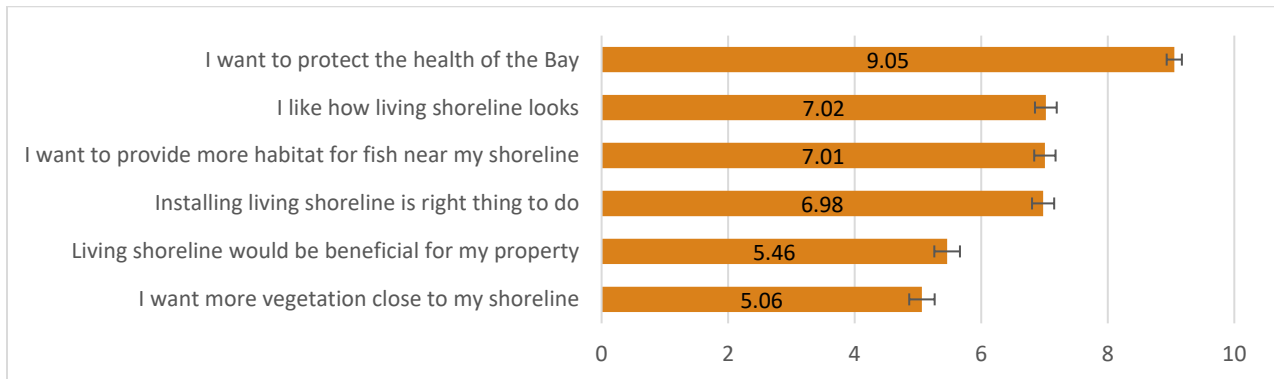| Statement	Rating
I do not want to apply for permits to install living shoreline	5.30
Living shoreline is too expensive	5.29
I do not think living shoreline would provide erosion control	4.96
I do not want to take care of vegetation	4.49
Living shoreline would make shoreline less accessible	4.43
Living shoreline would look odd compared to neighbors	3.88
Do not know how to find professional to install living shoreline	3.64
Installing living shoreline is too complicated	3.42
I do not understand what living shoreline is	2.52

To assess benefits to installing a living shoreline on their property, respondents were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

Figure 2: Ranked Benefits to Installing a Living Shoreline

Statement	Rating
I want to protect the health of the Bay	9.05
I like how living shoreline looks	7.02
I want to provide more habitat for fish near my shoreline	7.01
Installing living shoreline is right thing to do	6.98
Living shoreline would be beneficial for my property	5.46
I want more vegetation close to my shoreline	5.06

Planting Upland Vegetation

To assess barriers to planting upland vegetation on their property, respondents were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

Figure 3: Barriers to Planting Upland Vegetation

To assess benefits to planting upland vegetation on their property, respondents were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).
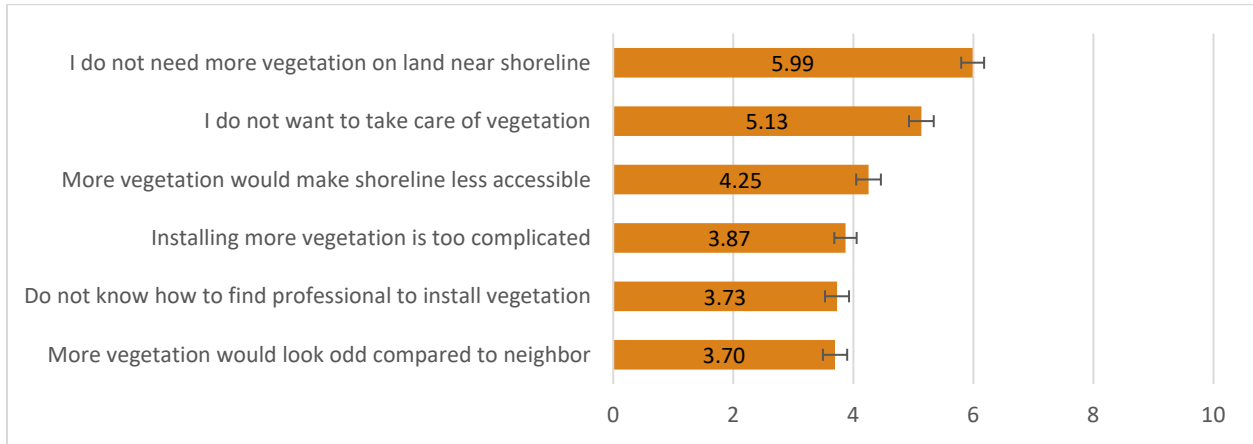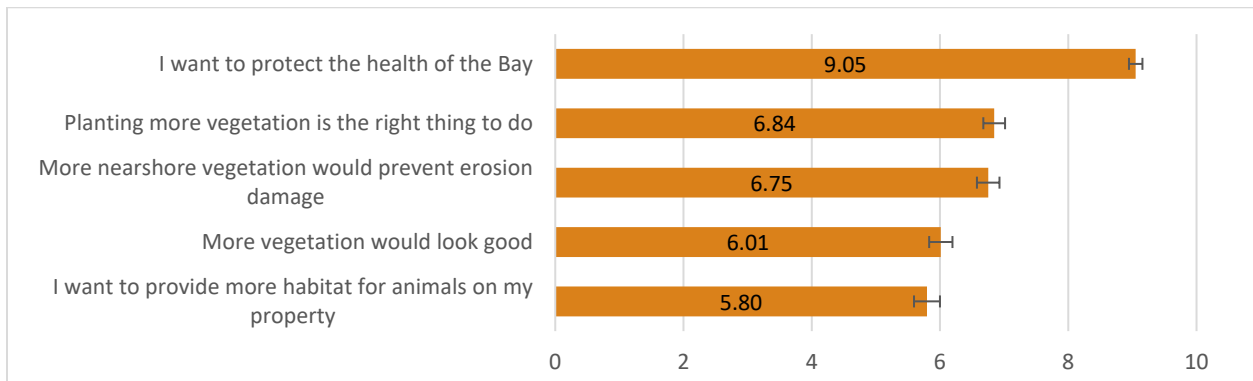
Figure 4: Benefits to Planting Upland Vegetation

Leaving Shorelines Unarmored

To assess barriers and benefits to leaving a shoreline unarmored on their property, respondents who did not have armor were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

Figure 5: Barriers and Benefits to Leaving Shorelines Unarmored

Removing Armor

To assess barriers and benefits to removing armor on their property, respondents who had armor were provided a list of statements and asked to rate each one using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

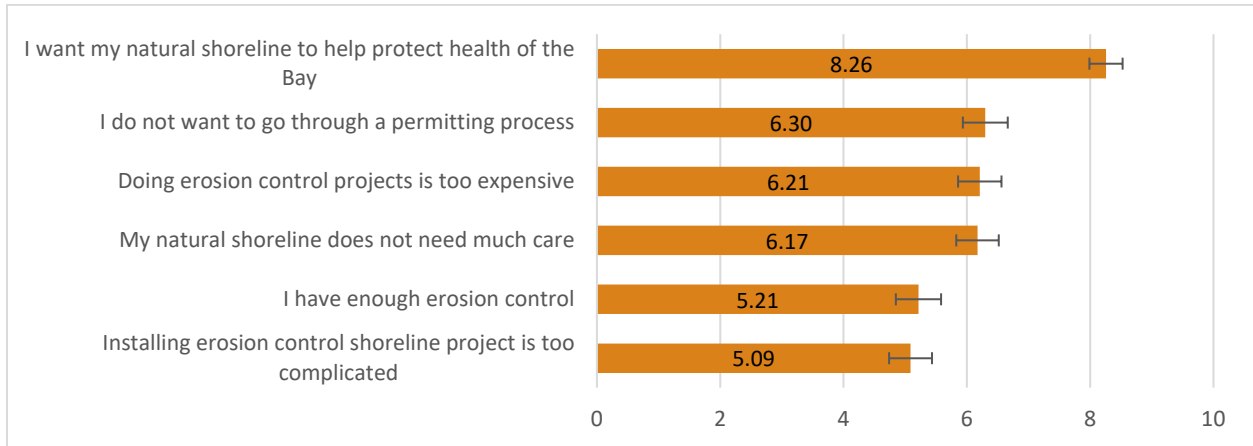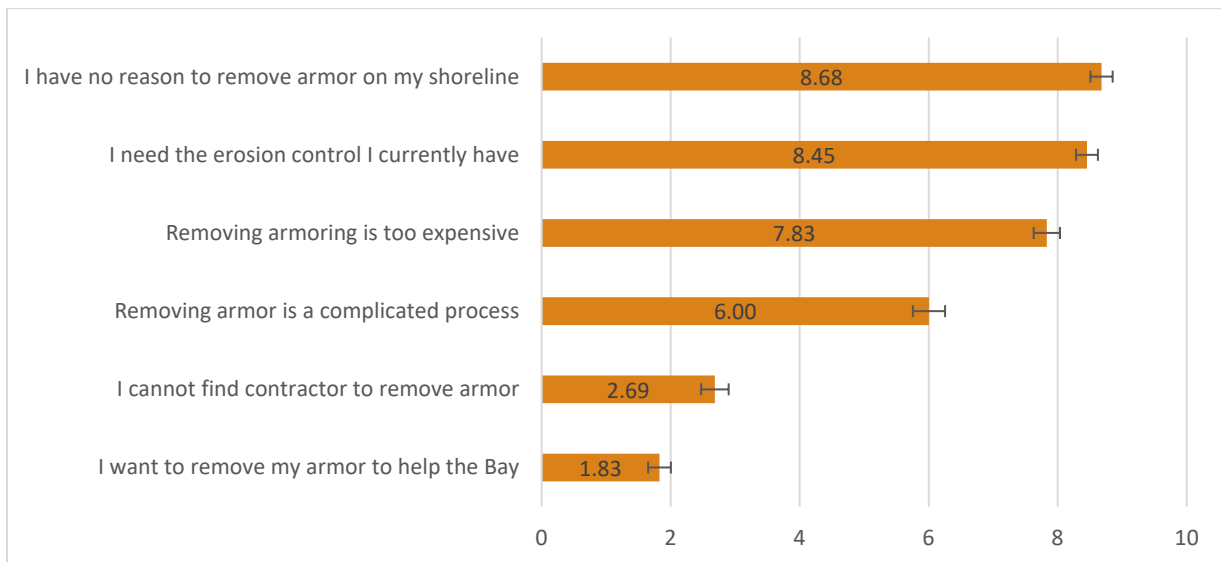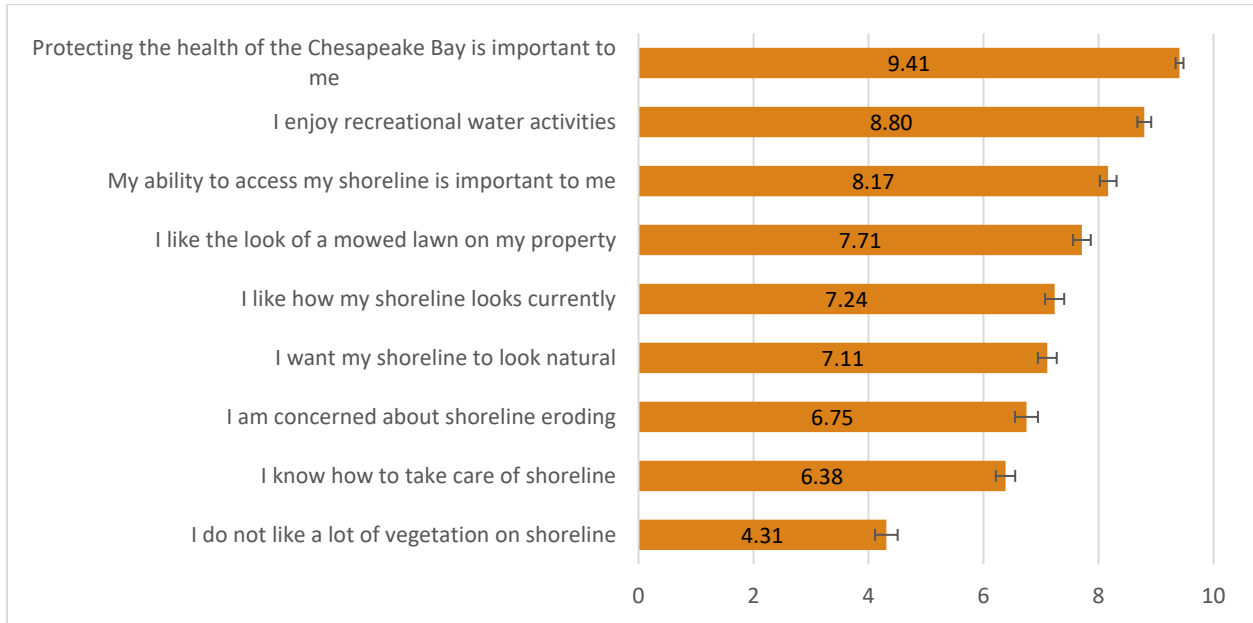*Figure 6: Barriers and Benefits to Removing Armor*

Shoreline Attitudes

Respondents were asked to rate their agreement with a variety of statements about their shoreline-related attitudes using a scale from 0 (*strongly disagree*) to 10 (*strongly agree*).

Figure 7: Shoreline-Related Attitudes

Statement	Rating
Protecting the health of the Chesapeake Bay is important to me	9.41
I enjoy recreational water activities	8.80
My ability to access my shoreline is important to me	8.17
I like the look of a mowed lawn on my property	7.71
I like how my shoreline looks currently	7.24
I want my shoreline to look natural	7.11
I am concerned about shoreline eroding	6.75
I know how to take care of shoreline	6.38
I do not like a lot of vegetation on shoreline	4.31

Communication

Respondents were asked to indicate which sources of information that they would use when they have questions about managing their shoreline and were allowed to check all that applied.

Figure 8: Information Sources for Shoreline Management

Source	Percent
Neighbors	58.4%
Friends and family	44.6%
Contractor	44.0%
State environmental or natural resources agency	27.8%
County or city government	27.8%
Other	18.0%
Nonprofit	7.3%
University	4.6%
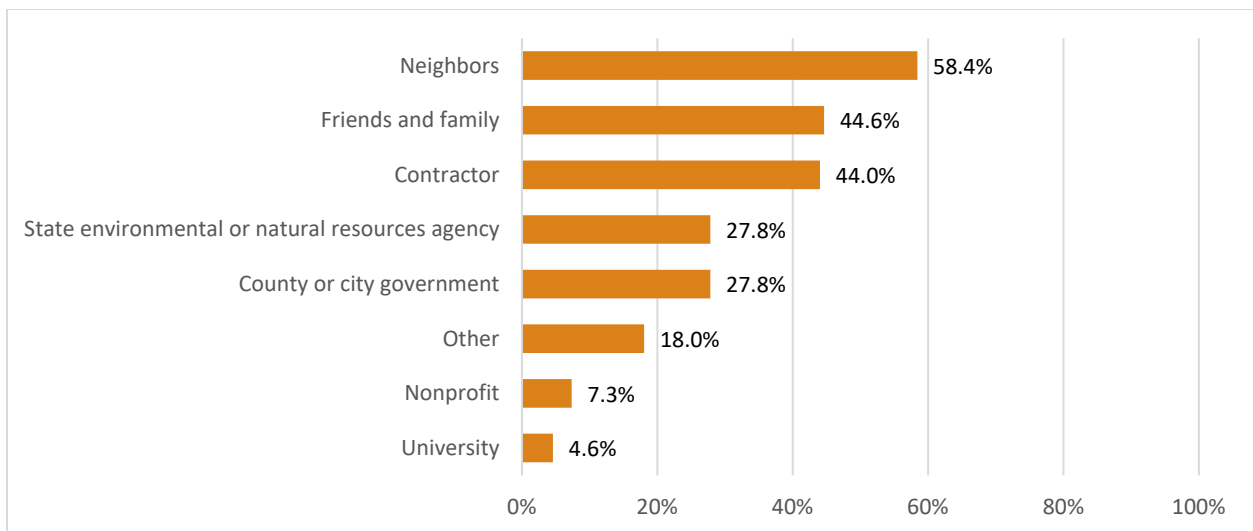
The barriers and benefits for planting upland vegetation and installing a living shoreline, as well as attitudes toward shorelines, were compared between respondents that reporting having and not having armor. The overall pattern was that the top barriers and benefits were the same across both groups, but those with armor perceived the second tier of barriers stronger than those without.

Focus Groups

After the survey, the team sought to learn more in-depth information about property owners. We conducted two focus groups over Zoom on November 18th and November 19th to gather information on shoreline management. The focus groups sought to determine how social networks function in shoreline communities, as well as more in-depth information on the barriers and benefits property owners face to keeping their shoreline natural, planting vegetation, and installing a living shoreline. The focus group discussion guide was developed using a literature review, the steering committee expertise, and a mail survey to Chesapeake Bay shoreline property owners.

We had a total of eight participants between the two groups: four participants on November 18th and four on November 19th.

Methods

Participants were recruited via two methods: a random selection of survey respondents were sent postcards and ads over Facebook. Participants were qualified for the focus group using an online survey that required them to: (1) live in Maryland, Virginia, or Delaware; (2) own shoreline property, (3) not have armor (bulkheads and riprap) and (4) be available on one of the dates. Participants were screened over the phone to check their survey answers and ensure they were able to use Zoom with audio and video. The focus group lasted approximately 90 minutes, and participants were provided with a $50 gift card for their time.

Themes

Multiple themes emerged during the focus groups which are summarized below. The full focus group report also includes participant quotes; these are cut for brevity of this plan.

Shoreline Property Owners are an Insular Group

Internal group conversations are key information sources, as they are a tightknit community. All participants cited that shoreline property owners were a community amongst themselves – they reported generally living in smaller neighborhoods and asking their neighbors and social contacts for information. Shoreline management was one topic among many that regularly comes up in conversation, from boating to crabbing to shoreline management and erosion.

Well-respected and well-known residents are generally long-term owners with interesting property elements and are knowledgeable of the specific community. When participants were asked who is the type of person they go to for credible information, they reported individuals who had lived in the community for a longer time, who know about their specific area, and who are already putting interesting design and management elements on their property.

Participants described two potential sub-groups: the "Come Here's" and the "From Here's." Participants identified two distinct groups of property owners – those who "come here" either as vacation homeowners or as a relatively new homeowner, and those who are "from here," having lived

in their community for a long time. When the terms were explained to the facilitator, all participants nodded along. Participants suggested that these groups may not significantly mingle, as those who are "from here" may see those who "come here" as an outgroup.

Social Diffusion Tools

Participants are intentionally scoping out shorelines whenever they are on the water. When asked how they know how others in their community manage their shorelines, most participants responded that when they engage in water activities (kayaking, boating, etc.), they are often purposefully looking at others shorelines to see how they are approaching management and erosion control.

Social contacts are key, either in person or online. In person communication included over the fence/property line, while walking with dogs or alone, intentional group gatherings, and other local gathering spots. Online communication focused primarily on local Facebook groups or individual connections with residents. Participants also mentioned regularly reading local newspapers and newsletters that are focused on local events, as well as local organizations like the Virginia Institute of Marine Science (VIMS) and Master gardeners.

Program Design Elements

Owners need to understand the effectiveness of alternative methods to armoring. While the participants reported hearing about living shorelines and natural shorelines, they were still not certain if these methods of management would be effective for reducing erosion and allowing their shoreline to remain accessible. Even though these participants did not currently have armor, some were still uncertain if they would stay unarmored in the future. Respondents were concerned about general effectiveness, as well as effectiveness against the increased erosion caused by neighbors armoring their own property.

Participants were comfortable with the terminology but needed elaboration. Participants felt they could understand the term "armor," but reported preferring "hardening" or "riprap and bulkhead." No matter what term was used, participants suggested that some imagery should be used to clarify. Similarly, participants felt comfortable with the term "living shoreline" but still suggested that imagery should be used to clarify the term. Finally, participants were mixed on the term "riparian" or "upland" and felt simpler terminology would be clearer, such as "vegetation above the tide."

A list of reliable and credible local contractors would be key. One participant had completed a living shoreline and mentioned that it took her quite a long time to identify a credible, reliable contractor who would complete the project within her budget. When asked about installing themselves or hiring a contractor, several participants mentioned that they would appreciate a local list of contractors. Another mentioned wanting someone to come consult on his property to provide informed and customized recommendations.

Conclusions

Overall, it appeared that shoreline property owners in the Chesapeake Bay region have shared experiences managing their shorelines and that these experiences are communicated between property owners. These results supported the findings of the survey, further clarified the extent to which this is true, and illuminated methods that could be leveraged in these networks to improve management techniques. The focus groups also illuminated the difficulties shoreline property owners face when attempting to manage erosion without armoring and the skepticism around the effectiveness of alternative methods.

Recommendations

The focus groups provided valuable insights that will inform the components of the implementation plan. We recommend the following to be included in the development of a program:

- **Community Ambassadors:** Shoreline property owners clearly discuss shoreline management with one another and share resources on the topic. This indicates that a Living Shoreline or Natural Shoreline ambassador in each community will likely be critical for facilitating social diffusion and must be selected carefully. As mentioned, a long-term resident that is well-known and well-respected by their neighbors is ideal and efforts should be made to properly identify this individual through discussions with residents. There may be resistance for adopting new approaches to shoreline management from the "From Here" residents if it is being championed by a "Come Here" resident. It may be beneficial to identify one ambassador in each group to assist with social diffusion.

- **Tools for Direct and Digital Conversations:** Since shoreline property owners discuss management methods among themselves, developing scripts or other similar types of communication tools can assist neighbors in properly discussing the methods and offering correct suggestions for implementation. Given the findings of this group, we recommend these tools include both physical elements that can be shared in person as well as digital formats that can be shared over social media.

- **Visual Social Diffusion Signage Facing Water:** As part of the social diffusion efforts made by community ambassadors, signage may be included to highlight the type of approach being used by residents. In many other programs, this takes the format of a lawn sign, recycling bin stickers, or other designs that face out toward the street. However, since the management techniques would be put in place along or near shorelines, we recommend that signage should be placed near the plantings/techniques and facing the water. Participants mentioned that viewing neighboring properties shorelines was common and drawing attention to these practices where they occur increases the effectiveness of the approach. Since the water-facing signage will be competing with a variety of visual stimuli, the signage will need to be highly visible (e.g., bright colors, limited text) to engage from the water.

- **Leverage Local Communication Channels:** Participants mentioned that each community had a hyper-local news source, such as a newsletter, radio station, or Facebook group. Because of the nature of this audience, we recommend determining this source for the target community and developing materials that align with the communication channel type. For instance, if a newsletter is determined to be the go-to news source for the community, advertisements can be created and placed in the newsletter promoting living shorelines or outreach events.

- **Use Imagery to Clarify Terms:** When developing communication tools, we recommend clarifying technical terms such as living shorelines and armoring by including pictures of each term. This is the most effective way to ensure that complex definitions are easily understood by the target audience and ensures that the type of management technique being championed is defined the same across community members. This reduces confusion and promotes the adoption of the correct methods. It can also enhance the visual appeal of materials being disseminated.

- **Elaborate on Effectiveness of Alternative Methods:** Participants reported that there is uncertainty around the effectiveness of alternative methods for erosion control and that community members would be interested in understanding the benefits to alternative methods. It was mentioned that community presentations or webinars could be an option for

communicating this type of information. Participants stated that local groups or HOAs may be able to facilitate/host these presentations. We recommend the implementing group partner with local community organizations to provide educational presentations to residents. We also recommend highlighting the benefits of alternative methods and describing how alternative methods control erosion along with their effectiveness.

- **Consider Local Messengers**: While not a direct result from the focus groups, there was some evidence that the Chesapeake Bay Program and Chesapeake Bay Foundation are interchangeable in residents' minds. Our studies did not uncover specific issues with this association; however, the Chesapeake Bay Program should consider if this association may have any impacts on how the information is received by residents in target areas. Partnering with other highly regarded organizations such as VIMS or the Maryland Department of Natural Resources could help to build trust in the messaging and is recommended where possible.

- **List of Local Contractors:** Multiple participants mentioned challenges around identifying a contractor that was trustworthy and affordable. As part of the toolkit, the local implementing organization should be advised to develop a list of credible local contractors that can be provided to Bay Protector ambassadors to distribute within their community. If recommending contractors is not feasible for this program, a list of questions residents can ask contractors, and the expected answers, should be considered. This will help guide residents to contractors qualified to assist in implementing living shorelines. Another list of where residents can find plants for living shorelines would also be beneficial.

Step 3: Strategy Development

Based on the results of the barrier and benefit survey and the focus groups, we designed a tiered progression to behavior change, starting with *keeping the shoreline natural*, moving to *planting upland vegetation*, and finally, to *installing a living shoreline,* when erosion control is needed (Figure 9). The results indicated that a community-based social marketing behavior change program should prioritize those properties that do not currently have an armored shoreline, as they face fewer barriers to action. We recommend that this approach focus first on the portion of shoreline property owners who are mostly willing and likely to adopt the targeted behaviors. This allows for the program to be further refined through repeated iterations prior to implementation with more challenging audiences. Moreover, a more influential social norm will be built as more properties publicly demonstrate their participation. Finally, we recommend that further research be conducted around the significant barriers to armor removal; current findings and recommendations are included at the end of this section.

Bay Protector Program

The strongest benefit respondents perceived to all of the targeted behaviors was protecting the health of the Chesapeake Bay – therefore, the name "Bay Protector" was selected as unifying theme. The specific behavioral strategies for each tier of the program are briefly summarized below, followed by more specific information on the program design. Detailed strategy tables can be found in the August 2020 report, *Survey Results – Shoreline Management Barriers and Benefits*. As shown in Figure 9, the goal is to progress to Tier 2 – however, the program will be considered a success if property owners are in any Tier where they do not have armor on their property. Tier 0 is listed but separated from the other tiers to show that while it is not being specifically addressed in this initial iteration of the Bay Protector program, it is still an important element to keep in mind for shoreline management programs. The focus groups confirmed that this approach would be best, considering that planting upland vegetation and living shorelines can be a long, expensive process for owners. Thus, encouraging unarmored properties to "leave shoreline alone" appears to be a beneficial middle ground.

Figure 9: Target Behavior Tiers

Tier 1 – Leave the Shoreline Alone

The first behavioral tier is to leave the property's shoreline alone. This is the simplest action for shoreline property owners to engage in while still creating a positive impact on the Bay. As reported above, the most significant barrier to this behavior is uncertainty among property owners that they have *enough erosion control* with a natural shoreline*.* This issue was also confirmed and discussed in the focus groups. Depending on the property and the shoreline management techniques used by neighbors, this may or may not be a misperception. This tier, in part, recognizes that there is low motivation to take any shoreline management action, as leaving the shoreline alone requires little active action from the participant.

Social science tools to integrate:

1. Social Diffusion
2. Commitment
3. Education
4. Cognitive Dissonance

Tier 2a – Plant Upland Vegetation

Owners who were willing to keep their shoreline natural will be encouraged to plant upland vegetation. This behavior serves as a "foot-in-the-door" for a living shoreline, the second part of this tier of behaviors. When one is considering adopting a new behavior, particularly a resource-demanding one, individuals are more likely to adopt it if they have first committed to a smaller "introductory" action. Planting upland vegetation will be used as a trial run for a property owner to "test out" more vegetation before committing to a full living shoreline. However, this is not a necessary prerequisite to planting a living shoreline; thus, property owners can engage in either, or ideally both, to protect their shorelines without armoring them.

Social science tools to be integrate:

1. Social Diffusion
2. Commitment
3. Goal Setting (Implementation Intentions)
4. Education
5. Cognitive Dissonance

Tier 2b – Install Living Shoreline

Owners who were willing to plant upland vegetation will be encouraged to install a living shoreline. Alternatively, those who have already planted upland vegetation previously or those more interested in living shorelines than upland vegetation can be encouraged to install living shorelines as well. We recommend working hands-on with shoreline owners for this specific behavior, given the complexity of and low motivation toward the behavior. The focus groups reaffirmed this challenge and participants mentioned frequently the difficulties in properly installing living shorelines.

Social sciences tools to integrate:

1. Social Diffusion
2. Commitment
3. Goal Setting (Implementation Intentions)
4. Education

5. Cognitive Dissonance
6. Convenience
7. Incentives

Communication

The communication channels, key messages, and messengers define how the program will be communicated to the target audience. Figure 10 illustrates the features of the program, as well as how in the future, the focus of the Bay Protector program could expand out to other topics related to protecting the Bay, such as water pollution prevention or submerged aquatic vegetation protection.

Figure 10: Bay Protector Website as a Communication Platform

Channel

- Bay Protector Website and Living Shoreline landing page
- Bay Protector Facebook page
- Flyer
- Water-facing shoreline sign
- Local government website
- Social media – neighborhood or hyper-local group pages
- Community ambassadors
- Demonstration events
- Community Presentations
- Local newsletters
- Local radio stations

Potential Messages

- **Social Diffusion:** I am a Bay Protector – Ask me how
- **Cognitive Dissonance:** As someone who lives on a Bay shoreline, we know you want to help protect it; Protecting the Bay is important to all of us living on the shoreline, do your part to keep our Bay healthy
- **Enhance Benefits:** Leaving your shoreline alone and natural is the easiest and lowest cost choice
- **Social Norms:** Many property owners like how a natural shoreline looks
- **Enhance Benefits:** You can prevent excessive erosion while protecting the Bay
- **Social Norm:** Protecting the Bay is the right thing to do
- **Enhance Benefits:** Planting a living shoreline provides wildlife habitats

Messengers

- Chesapeake Bay Program (CBP)
- Local watershed organizations
- Local government/community organizations (HOAs, local groups)
- Virginia Institute of Marine Science (VIMS)
- Maryland Department of Natural Resources (MDNR)

Outreach Elements

The following materials are proposed as components of the Bay Protector program. The program would be implemented by local government (such as MDNR), watershed organizations, and community partners (such as VIMS). CBP would provide the toolkit and support.

Figure 11: Outreach and Program Steps

Toolkit

CBP will provide a toolkit packet to assist local organizations with implement the Bay Protector: Living Shorelines program. This will include elements such as:

1. Instructions on how to identify and recruit well-known, well-respected shoreline property owners;
2. Customizable templates (flyers, shoreline signs, sign-up sheets);
3. Resources on how to host effective demonstration events, including scripts;
4. Suggestions for communication channels and potential partners;
5. Instructions on how to obtain testimonials and take shoreline photographs; and
6. Step by step implementation instructions.

Recruit Owners

The Bay Protector program will begin with the local organization securing commitments from well-known, well-respected property owners that have either (1) left their shoreline natural, (2) planted upland vegetation, or (3) installed a living shoreline. The toolkit will outline several options for recruitment of potential ambassadors, including:

1. Targeted Facebook, Nextdoor and/or Google advertisements;
2. Short interviews with local groups, such as Master Gardeners, local government, business leaders, Chesapeake Bay education/advocacy organizations, landscape companies with living shoreline installation services, and organizers of community gathering spaces; and
3. Door-to-door outreach to properties identified as potentially having necessary attributes through GIS and high visibility.

These methods can use similar simple messaging used to recruit for the focus group, such as:

"Shoreline Ambassadors Needed!

Are you interested in keeping the Chesapeake Bay healthy and learning more about your shoreline management options? The [IMPLEMENTING ORGANIZATION] will be piloting a program to help waterfront property owners manage their shoreline while protecting the Chesapeake Bay. We are seeking participation and input from residents like you! Participants will receive resources about shoreline management options and support to become an ambassador for their community about shoreline management. Contact [CONTACT INFORMATION] for more information or to get started!"

Interested property owners will be briefly interviewed to confirm if they are suitable ambassadors and to identify additional well-respected and well-known members of their community. This could include questions used in the focus group, such as:

1. How do you typically interact or communicate with your neighbors? Do you communicate with them about shoreline management/issues?
2. How do you typically communicate with your family/friends about shoreline issues?
3. Are there any formal or informal neighborhood associations where residents can communicate with one another? (PROMPT: For example, are there HOAs where you live)

      a. Is [organization] used regularly?

      b. Which is the most respected?

      c. Would you consider this organization to be well-respected?

4. For your immediate neighborhood, are there any homeowners who you would consider well-known AND well-respected among the neighbors? Who are they?

5. Who would you go to for shoreline management questions and advice? Why?

The answers to these questions should reveal whether the interested property owner is typically communicating with others in their community about shoreline management (#1 and #2), as well as point in the direction of any other potential organizations (#3) and property owners (#4 and #5) that would be useful for communicating with the broader community. Once identified, ambassadors should be presented with the program materials and asked to commit to participate. The focus group participants identified two groups of shoreline residents – the 'come here' residents and the 'from here' residents. When choosing ambassadors, we recommend selecting ambassadors from each group to ensure relevance and accessibility across groups.

To increase participation, we recommend ambassadors are offered some technical and resource assistance to put in vegetation and/or a living shoreline (if not already installed) with their agreement to be an ambassador. If the ambassadors utilize the resources and install the vegetation, their property can become a demonstration site which serves to showcase best practices and encourage adoption by neighbors. It is important to note that commitments should not be paired directly with incentives, so caution should be used when advertising the benefits to becoming an ambassador to ensure it is not paired directly with the commitment request.

Once the initial well-known, well-respected property owners' commitments have been obtained and publicized, subsequent rounds of recruitment will focus on the broader community.

Commitment Card and Script

A commitment card will ask the identified well-known, well-respected property owners to commit to one or more options. The commitment should be available in a physical and digital format.

Shoreline Owners at Tier 1:

1. Continue to leave their shoreline natural
2. Talk to their neighbors about leaving their shorelines natural
3. Host a demonstration event on their property
4. Plant upland vegetation [Tier 2a]

Shoreline Owners at Tier 2a:

1. Continue to maintain or increase their upland vegetation
2. Talk to their neighbors about planting upland vegetation
3. Host a demonstration event on their property
4. Install a living shoreline [Tier 2b]

Shoreline Owners at Tier 2b:

1. Continue to maintain or increase their living shoreline
2. Talk to their neighbors about installing a living shoreline

3. Host a demonstration event on their property
4. Install upland vegetation (if they haven't) [Tier 2a]

The commitment card will also request information for follow up contact: (1) a short term follow up to provide assistance with the current commitment and implementation intention and (2) enrollment in an automated email campaign that seeks to motivate them to commit to the next tier of behavior, if applicable.

Program Materials – All Tiers

For all tiers, program participants would receive the following:

CBSM Flyer/Website

All participants will receive a flyer, in both print and digital, and a link to a website that will incorporate appropriate social science tools such as social norms, vivid communication, and testimonials. The materials will be customized by the type of commitment.

- **Maintain Tier 1 Outreach:** Includes credible, vivid information about how natural shorelines are the easiest choice for protecting the Bay. It will highlight how many property owners like the look of a natural shoreline. It will also provide simple ways to indicate between "normal" and "excessive" erosion, along with simple, vivid information on how shorelines in their local area can be left alone without causing issues. Imagery of the different terms (living shoreline, upland vegetation, armoring) should be included.

- **Maintain or move to Tier 2a Outreach:** Includes credible, vivid information about how specific plants can address concerns (e.g., lower maintenance plants, more accessible shoreline) and have a positive impact on the health of the Chesapeake Bay. It will also provide simple ways to indicate between "normal" and "excessive" erosion, along with simple, vivid information about how upland vegetation prevents erosion. The outreach will also highlight how planting is the right thing to do and that many property owners like the look of a natural shoreline. Imagery of the different terms (living shoreline, upland vegetation, armoring) should be included. Finally, it will include a list of local contractors that can provide assistance with and guidance for specific plants for different shorelines. If a list is not feasible or recommendations cannot be made, we recommend providing a list of questions a property owner can ask a contractor and expected answers. This list will help guide property owners to appropriate contractors for the job. A list of nurseries or other locations that sell plants for upland vegetation efforts will also be included.

- **Maintain or move to Tier 2b Outreach:** Includes credible, vivid information about how living shorelines can address concerns (e.g., lower maintenance plants, more accessible shoreline), what incentives are available, and a guide to the permitting process. It will also provide simple ways to indicate between "normal" and "excessive" erosion, along with simple, vivid information about how living shorelines prevent erosion. The outreach will also highlight how living shorelines create habitats, have a positive impact on the health of the Chesapeake Bay, and that many property owners like the look of a natural shoreline. The outreach will also address the ways a living shoreline is superior to armor. Imagery of the different terms (living shoreline, upland vegetation, armoring) should be included. Finally, it will include a list of local contractors that can provide assistance with and guidance for living shorelines. If a list is not feasible or recommendations cannot be made, we recommend providing a list of questions a

property owner can ask a contractor and expected answers. This list will help guide property owners to appropriate contractors for the job. A list of nurseries or other locations that sell plants for living shoreline efforts will also be included.

The outreach will be refined as more testimonials and local photographs become available. Once sufficient testimonials and mapped shorelines have been collected, participants will be provided with a link to see where local projects are, what they look like, and what the owner's experience has been with their shoreline. If the owner commits to talking to their neighbors, they will be provided one to three additional pieces of outreach and commitment cards, if physical materials are used.

Shoreline Sign

All participants will receive a water-facing shoreline sign with the program branding and primary message, such as, "I'm A (LOCATION) Bay Protector – Ask Me How I'm [Planting/Keeping My Shoreline Natural]!"

Demonstration Event

If the owner commits to an event, a sign-up sheet or digital sign-up link will be provided to schedule the event. The toolkit will include a guide for the implementing organization to host a successful event.

Local Projects Map

Participants will be asked if they are willing to be interviewed for a testimonial and have their shoreline photographed for the map of projects. The toolkit will include a script for interviewing for a testimonial and a guide to creating an effective testimonial, as well as the example testimonial on the flyer.

Living Shoreline Technical Resources

The living shoreline website will also serve as a database for existing resources and best practices related to living shorelines from across the Chesapeake Bay Watershed for use by local organizations.

Summary of Strategy Deliverables

Within the current scope of work, Action Research proposes creating the following deliverables:

Campaign Implementation and Evaluation Plan

A detailed actionable plan for creation of the Bay Protector program, with steps outlined in deployable phases and organized according to ease of implementation and priority for achieving campaign objectives.

Message Testing

Shoreline property owners with a natural shoreline, upland vegetation, or living shoreline (Tiers 1, 2a and 2b) will be recruited for a focus group to assess interest in Bay Protector program, deliverables, and messages. The focus group will assess potential barriers to program participation and reception of various program parts.

Outreach to Organizational Support Network

Communication outreach strategy targeted to supporting organizations to inform of the Bay Protector program's objectives, progress-to-date, and plans for the future. Strategy will aim to identify potential facilitating organizations for further program outreach and grant opportunities for continued funding of the phased Bay Protector Campaign Implementation and Evaluation Plan.

Required Expertise for Program Development and Implementation

To create the Bay Protector program outlined above and successfully execute the Campaign Implementation and Evaluation Plan, a contractor or organization would need the following capabilities:

Social Marketing Expertise

Understanding of social science principles and communication best practices, expertise in behavioral science and utilization of community-based social marketing, and proven track record in developing and implementing successful behavior change campaigns. These skills are necessary to interpret existing behavioral science research, set achievable program and behavior change objectives, implement the program, and evaluate.

Campaign Evaluation Expertise

Survey design and behavior-based evaluation, survey implementation and analysis, track record of utilizing digital analytics metrics to assess and optimize campaign performance over time. Developing and analyzing surveys, both for program outreach and evaluation research, will be critical to identifying potential program participants, facilitating program onboarding, and analyzing the success of the program.

Digital Marketing Strategy Expertise

Website design and development, user interface (UI) and user experience (UX) design expertise, automated email campaign design and development, social media campaign design and development, content strategy development, and digital advertising expertise and management.

Graphic Design

Brand development and print and digital collateral development.

Potential Additional Research Needed: Tier 0 – Remove Armor

Armored shorelines represent a larger portion of the audience; however, prior to engaging in any of the tiered behaviors, currently armored shoreline property owners must first remove their armor. Respondents with armored shorelines were much more likely to agree that they *like how [their] shoreline looks* and *do not like a lot of vegetation on shoreline,* and significantly less likely to agree that they *want [their] shoreline to look natural*. These attitude differences, in addition to the higher rating of barriers to planting upland vegetation and installing a living shoreline, and the difficulty of armor removal, suggest that this audience will be more challenging to motivate without additional incentives and technical support.

Once currently unarmored properties are successfully motivated to take the tiered actions, there will be more pathways for creating social diffusion in the community, and ultimately toward a social norm of keeping shorelines natural, planting upland vegetation, and installing a living shoreline. However, there will still likely need to be additional program elements that are developed specifically to address the barriers related to armor removal, such as cost and permitting.

Additional focused research may be required to develop an effective program for armor removal. We recommend consulting with existing programs and shoreline experts specifically on armor removal and collecting information on their best practices and lessons learned. The results of that work could then be used to conduct either a survey or two to three focus groups with owners of properties with armor about their barriers, motivations, attitudes, knowledge, and best opportunities to remove and replace armor (such as end of life).

Step 4: Pilot Testing

Once the materials have been designed, the Bay Protector program should be evaluated on a small scale, pilot basis to determine its effectiveness. Ideally, a pilot would be evaluated by direct behavioral observation of property owners leaving their property natural, installing living shorelines, or planting upland vegetation. However, as shoreline management behaviors happen in a semi-private setting and take longer than the typical duration of a pilot (1-2 months), we recommend using metrics that are indirectly related to behavior, but more easily measured. If resources allow, we also recommend using at least two forms of evaluation to validate the findings. Below is a general description of a typical pilot design followed by the evaluation methods that may be used to show impact.

Overall Pilot Design

Ideally, a pilot test would employ an experimental design to measure the impact of the program on the target behavior. This would take the form of designating a test and control group where the test group receives the program materials and the control group does not. Baseline measures of the behavior should be conducted in both test and control sites at the same time. In this case, observations of current management practices should be made, if possible. After baseline measurements have been collected, the test group should receive materials. Once materials are distributed and a pre-determined amount of time has elapsed (whatever timeframe is reasonable for people to have been exposed and engaged with the material), a follow up set of measurements should be conducted (the same type as pre-test measurements). This may involve multiple rounds after implementation in order to collect sufficient data. Post-test measurements should also be conducted at the same intervals in the control group so the data can be compared. After all post-test data in collected in each group, comparisons should be made to determine the impact of the program on the target behavior(s).

A true experimental design may not be feasible, and measurements may include proxies instead of actual behavior given the issues mentioned above (semi-private, long duration to establish). While we recommend an experimental design whenever possible, adjustments can be made to the outlined procedure to accommodate external constraints. In order to attribute changes to the program, however, some type of control group will be needed.

Evaluation Methods

The evaluation methods are listed in order of priority based on ease of implementation and likely value of the results.

- **Program Participation:** Program participation could be evaluated through direct observation of the use of the social diffusion water-facing shoreline signage from a boat and reported number of demonstration events and conversations with social contacts.
- **Commitment to Act:** The program could be evaluated based on the number of commitments obtained, both from originally recruited participants and from social contacts, by the number of completed commitment cards obtained.
- **Digital Metrics:** Depending on the specific program implementation, the evaluation could also collect digital metrics such as website hits, pages visited, and social media engagement.

- **Post-intervention Survey:** Evaluation can include a post-intervention survey. This survey could be delivered through multiple methodologies, such as postcards, letters, phone calls, emails, etc. The survey would assess current shoreline management, behavioral intentions to act on the tiered actions, attitudes and knowledge toward shorelines, communication with social contacts about the program, and feedback on program materials.
- **Post-intervention Interviews/Focus Groups**: The program could also be evaluated through interviews with a random selection of participating shoreline property owners. The interviews would assess current shoreline management, behavioral intentions, attitudes and knowledge toward shorelines, and feedback on program materials.

This list provides general guidance based on the recommended program materials and formats. The final evaluation plan will depend on the resources available and the actual format of the developed program.