

Landowner Gap Analysis *for* **Tidal Wetland Conservation** *in the* Chesapeake Bay



Authors: Taryn Sudol and Julissa Murrieta, Maryland Sea Grant
Editor: Ashley Goetz, Maryland Sea Grant
Graphic design and layout: Jill Gallagher, Maryland Sea Grant

In 2025, the Chesapeake Bay Trust commissioned a gap analysis report to support and inform a landowner engagement effort aimed at accelerating coastal wetland conservation. This report identifies barriers to conservation on private lands, effective strategies for communicating with landowners, and areas where increased support can have the greatest impact. Findings and recommendations are organized around understanding landowner audiences, improving outreach, and addressing regulatory challenges to meet wetland goals. Insights from this report may be useful for conservation organizations, government agencies, and others working to engage private landowners in wetland restoration and stewardship.

This publication was made possible by grant 26157 to Maryland Sea Grant from the Chesapeake Bay Trust.

Preferred citation:

Sudol, T., & Murrieta, J. (2025). *Landowner Gap Analysis for Tidal Wetland Conservation in the Chesapeake Bay*. Maryland Sea Grant Publication UM-SG-TS-2025-07.

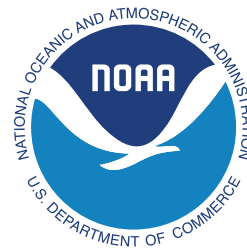
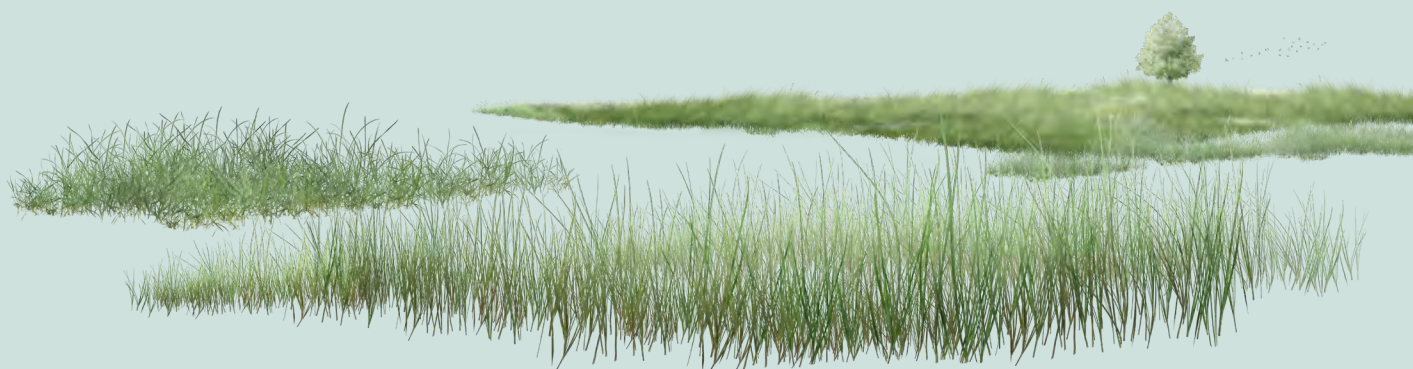


Table of Contents

Introduction and Background.....	4
Understanding Landowner Audiences.....	5
Considering Communication and Outreach.....	10
Navigating Policy and Regulation.....	16
Findings and Recommendations.....	25
Conclusion.....	29
Appendix.....	30



Introduction and Background

Tidal wetlands perform essential services for the Chesapeake Bay. They provide wildlife habitat and nursery grounds, support recreation and boating, filter nutrients and pollutants to improve water quality, sequester carbon, and reduce flood risk for adjacent communities (Barbier et al., 2011). Residents of the Chesapeake Bay watershed value maintaining these services. Yet over time, 1.5 million acres of tidal and nontidal wetlands have been lost to development and agriculture.

The Chesapeake Bay Watershed Agreement, signed in 2014, includes a “wetlands outcome” aimed at offsetting those losses. The outcome aims to create or restore 85,000 acres of tidal and nontidal wetlands in the watershed, and enhance another 150,000 acres of wetlands, by 2025 (Chesapeake Bay Watershed Agreement, 2014). Only an estimated 5% of this goal has been achieved to date. Changing environmental conditions, such as increased inundation and tidal regimes, further threaten wetland resiliency.

Most of the Bay’s tidal wetlands are located on private property. Therefore, it is essential to understand how landowners relate to their wetlands and identify ways to help them sustain or expand their tidal wetlands.

To accelerate tidal wetland conservation and restoration goals, the Environmental Protection Agency’s (EPA) Chesapeake Bay Program Office funded a Tidal Wetlands Landowner Community Engagement effort. The project’s goal is to “implement a comprehensive landowner engagement and outreach program focused on coastal wetlands restoration, with an emphasis on private landowners and coastal communities that will be disproportionately affected by sea level rise.”

This gap analysis aims to assess the best strategies for communicating with landowners, uncover barriers to adopting conservation practices, and pinpoint where to direct resources for the greatest impact. The findings presented in this report will help shape the Tidal Wetlands Landowner Community Engagement effort. Results are organized into three sections: understanding landowner audiences, considering communication and outreach, and navigating policy and regulation. The report concludes with the author’s recommendations for a landowner engagement strategy that builds on existing successes, addresses barriers to conservation, and fills gaps in knowledge and outreach.

The findings generated in this report are based on literature reviews and interviews with conservation practitioners. More details on methodology, as well as a list of references and interviewees, can be found in the Appendix.

“Most of the Bay’s tidal wetlands are located on private property. Therefore, it is essential to understand how landowners relate to their wetlands and identify ways to help them sustain or expand their tidal wetlands.”

GOALS & OUTCOMES

VITAL HABITATS

Increasing needs for land and resources have resulted in fragmentation and degradation of many habitats across the watershed while also challenging the health of many Bay watershed species. Conserving healthy habitats and restoring the connectivity and function of degraded habitats is essential to the long-term resilience and sustainability of the ecosystem and the region’s quality of life.

GOAL: Restore, enhance and protect a network of land and water habitats to support fish and wildlife, and to afford other public benefits, including water quality, recreational uses and scenic value across the watershed.

Wetlands Outcome	➔	Continually increase the capacity of wetlands to provide water quality and habitat benefits throughout the watershed. Create or re-establish 85,000 acres of tidal and non-tidal wetlands and enhance the function of an additional 150,000 acres of degraded wetlands by 2025. These activities may occur in any land use (including urban) but primarily occur in agricultural or natural landscapes.
Black Duck	➔	By 2025, restore, enhance and preserve wetland habitats that support a wintering population of 100,000 black ducks, a species representative of the health of tidal marshes across the watershed. Refine population targets through 2025 based on best available science.
Stream Health Outcome	➔	Continually improve stream health and function throughout the watershed. Improve health and function of ten percent of stream miles above the 2008 baseline for the Chesapeake Bay watershed.
Brook Trout	➔	Restore and sustain naturally reproducing brook trout populations in Chesapeake headwater streams with an eight percent increase in occupied habitat by 2025.

Chesapeake Bay Watershed Agreement

*Chesapeake Bay Watershed Agreement
“Wetlands Outcome” (2014)*

Understanding Landowner Audiences

What are their land characteristics?

Parcel size, land usage, and the presence of tidal wetlands can impact conservation efforts and outreach strategies.

Parcel Size

Waterfront properties along the Chesapeake Bay’s eastern and western shores range from small, urban parcels to large, rural properties. Conservationists may prioritize properties with longer extents of linear shoreline and greater acreage for wetland restoration. Organizations, such as the Maryland Department of Planning, The Nature Conservancy, Wetlands Watch, and Audubon Maryland-DC, often prioritize properties that meet certain criteria—such as a minimum parcel size—over smaller, fragmented areas. Wetlands Watch also emphasizes the value of connectivity across parcels (Hughes & Stiff, 2025). However, larger wetlands are more expensive to restore (Sudol et al., 2023). Living shorelines, for instance, are priced by linear foot. While price per foot may vary based on material and design, total costs increase with shoreline length (Gould, 2025). When prioritizing landowners by parcel size, consider:

- Smaller wetlands are more likely to receive active management than larger properties, which require more time, money, and resources to manage.
- Promoting wetland connectivity requires coordination among neighbors and partners, as well as consistent policies and practices.
- Assistance programs should cover ongoing maintenance and administrative costs, like fuel and monitoring expenses.



Land Usage

Broadly, coastal properties are residential or agricultural (this report does not cover commercial land use). Farmers must consider the profitability of their land, often in crop production or timber. They follow nutrient management policies, crop and conservation incentive programs, and other regulations that govern agriculture (OpinionWorks, 2016; Sudol et al., 2023; Tully & Gedan, 2025). Residential waterfront properties may be urban or rural. In general:

- Agricultural properties are larger, more rural, with more naturally occurring wetlands. They may be located in marsh migration corridors and often use passive management practices, such as conservation easements.
- Residential properties are typically smaller than working lands. Common conservation strategies include living shorelines and maintaining inland wetland vegetation.

Tidal Wetland Presence

Conservationists may need to encourage landowners to: create wetlands via living shorelines, maintain existing wetland vegetation, or allow more wetlands to migrate onto their property. Incentives, grants, loans, easements, and other assistance programs are available for each of these options. However, the conversation must start with how a property owner feels about having wetlands on their property.

Wetlands are prized for their habitat, wildlife viewing and hunting, water filtering services, and the sense of place they preserve—often preventing further development on a preserved wetland area (Chesapeake Bay Program, 2022; OpinionWorks, 2016). However, they can also be perceived as a haven for mosquitos and other destructive wildlife, like sika deer, geese, and beavers. They may be viewed as a source of “weeds” when *Phragmites australis* is present or woody vegetation overruns grass.

“Wetlands are prized for their habitat, wildlife viewing and hunting, water filtering services, and the sense of place they preserve—often preventing further development on a preserved wetland area.”

They may also be seen as a liability due to the government protections associated with wetlands (“When they declare it wetlands, you don’t own it”) (OpinionWorks, 2016; The Nature Conservancy, 2020; Sudol et al., 2023). Some property owners prefer a turfed landscape with gray infrastructure over a natural shoreline (Hughes & Stiff, 2025; Gould, 2025).

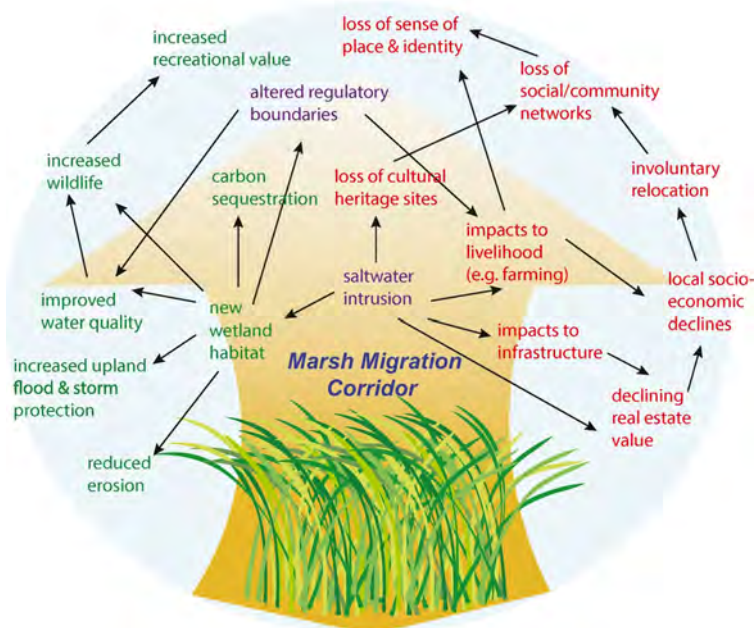
Marsh migration brings wetland vegetation farther inland, leading non-waterfront property owners to contend with wetland landscapes. On the Eastern Shore, where many residents are in lower socioeconomic brackets, communities are already struggling to manage the impacts of marsh migration (Van Dolah et al., 2020). “Some residents take actions to protect their property, such as adding dirt to elevate areas that have transitioned to wetland, only to learn such practices on converted uplands are prohibited under state tidal wetland regulations. Residents have become discouraged by—some even fearful of—environmental regulations that govern how they can protect themselves.” (Van Dolah et al., 2020).

As tides move farther inland with sea level rise, ecological succession causes wetlands to migrate inland, too, meaning some property owners have wetlands “encroaching” on their property. This may be an unwelcome “wetness” that impacts how a landowner can use their property, as well as its resale value. Some landowners may be unaware of how to properly manage a wetland (Van Dolah et al., 2020). The following classifications of property owners emerge:

- Receptive and willing to install living shorelines
- Prefer gray infrastructure over living shorelines
- Have wetlands on their property and want, or are open to, instruction on how to maintain them
- Have wetlands on their property but do not want them there

For this final group, it may be beneficial to discuss how they can coexist with wetlands.

Future Socio-Ecological Implications of Marsh Migration



This diagram illustrates the complex network of socio-ecological dimensions that are potentially affected by the construction of marsh migration corridors. Green denotes dimensions where marsh migration increases socio-ecological resilience, while red denotes the emergence of new vulnerabilities; purple denotes dimensions that could be considered beneficial or harmful to coastal resilience depending on one’s perspective (e.g., as a rural resident or wetland specialist).

Van Dolah, E.R., Miller Hesed, C.D. & Paolisso, M.J. Marsh Migration, Climate Change, and Coastal Resilience: Human Dimensions Considerations for a Fair Path Forward. Wetlands 40, 1751–1764 (2020).

<https://doi.org/10.1007/s13157-020-01388-0>

How do residential and agricultural land uses differ?

Here, we simplify landowners into two main audiences: residents with living shorelines and farmers with easements. Their attitudes and barriers to tidal wetland conservation are summarized below.

Residents with Living Shorelines

A resident's motivation for installing a living shoreline may include: aesthetics, access to the waterfront and related recreation, flood protection and overcoming failed gray infrastructure, and building connections with family or neighbors (Chesapeake Bay Program, 2022; Gould, 2025; Peabody, 2025). A living shoreline outreach campaign garnered examples of these sentiments. For one property owner, a living shoreline “restore[d] natural beauty to land that was once unappreciated.” For another, a sense of pride came from preserving family history and “knowing their personal landmarks will be protected for years to come.” (Chesapeake Bay Program, 2022).

Public recognition, such as the Elizabeth River Project's (ERP) River Star Home flag, can be an effective social marketing tool to encourage residents to maintain their living shorelines. The ERP also certifies businesses; they describe how a business benefits from the recognition and offer networking opportunities (Murrell, 2025). These tools may be most effective in suburban areas. Their effectiveness in rural settings, where flags and signage may be less visible, is unknown (Peabody, 2025).

Protecting property is a primary motivator for some landowners. In Virginia's Middle Peninsula, many residents seek living shorelines with sills to preserve existing marshes, particularly in sandy areas with eroding beaches (often a side effect of choices made by neighboring property owners). Virginia now mandates living shorelines, which begs the question of what qualifies as a living shoreline (Peabody, 2025). The Middle Peninsula is focused on hybrid living shorelines that use Flexamat, 3-D printed sills, and other structures to prevent erosion. It is the planning district's job to protect the community, tax base, and water quality, so it is important to account for what a homeowner wants (Peabody, 2025). Setting homeowner expectations is key to satisfaction (Chesapeake Bay Program, 2022).

Living shorelines must be designed to evolve over time. For example, they may include an upland buffer and no-mow zone to allow for marsh migration (Gould, 2025; Hughes & Stiff, 2025; Murrell, 2025). Mowing a wetland may increase erosion, reduce wave attenuation and water quality, introduce invasive plants, and degrade wildlife habitat. Although ongoing maintenance of a living shoreline is very different from turf maintenance, the ERP reports that this is not a detractor. Their homeowners choose this option and accept the responsibilities (Murrell, 2025).



Photo, Elizabeth River Project



Living shoreline in Maryland. Photo, Eric Buehl, University of Maryland Sea Grant Extension



“Emphasizing that a conservation approach can protect farmland may be more effective than asking farmers if they want wetlands.”

Farmers with Easements

Several state and federal programs, such as USDA’s Natural Resources Conservation Service, incentivize wetland conservation on agricultural lands due to their size, favorable topography, and potential for nutrient reduction. However, design and implementation challenges for those policies have led to resistance to participation in those programs (OpinionWorks, 2016; The Nature Conservancy, 2020; Tully & Gedan, 2025).

As one farmer described, the land they own is their greatest asset, so they want ultimate control over it (OpinionWorks, 2016). Likewise, profitability of their land is usually a top priority (OpinionWorks, 2016; Prezioso, 2025; Tully & Gedan, 2025). Generally, farmers will not convert land to wetlands if it means the loss of tillable acres (OpinionWorks, 2016; Tully & Gedan, 2025). The uncertainty of future commodity prices and market volatility (i.e., carbon markets) makes future cost-benefit analysis difficult (OpinionWorks, 2016; Tully & Gedan, 2025).



However, if a property contains marginal, unproductive farmland, government conservation or easement programs may be more appealing: “If I’m unproductive and no potential of getting anything from it, I can turn it into something beneficial to the environment, plus I can make a little money on it.” (OpinionWorks, 2016). The Nature Conservancy and Ducks Unlimited focus their outreach on those marginal lands (Heyn, 2025). Emphasizing that a conservation approach can protect farmland may be more effective than asking farmers if they want wetlands. For example, giving up a strip of land as a buffer to save upland fields may be seen as a reasonable tradeoff (Coleman, 2025; Tully & Gedan, 2025).

Easements can be generous to the extent that they outcompete other environmental market mechanisms (Newburn et al., 2025) or the risk that the County will protect significant tracts of land to the detriment of the long-term health and stability of the economy (The National Center for Smart Growth Research and Education, 2017). Even so, the commitments, methods, and management requirements of these programs may not appeal to farmers. This includes loss of privacy and property control, fear of future government regulations, and being locked into a long-term contract that may burden heirs or reduce the market value of their land (OpinionWorks, 2016). Farmers have also expressed frustration over the lack of flexibility these programs offer:

- “The federal government, they’ll do their damndest, but it can’t be one-size-fits-all. And that’s where they get in trouble, because they get tied up in a lot of regulations. One size doesn’t fit all. You can’t do on the Eastern Shore what they do out west. It doesn’t work. But they’re still a one-size-fits-all deal. And they’re a bureaucracy that’s hard to change.” (OpinionWorks, 2016)
- “He owns the property, but they won’t let him take 10 or 12 trees out so he can go on around. If it’s not affecting the other 50 acres or whatever it is, they ought to let him take that little piece out.” (OpinionWorks, 2016)

Additionally, some programs or policies may appear illogical or show a “lack of common sense,” which can lead to frustration and distrust (OpinionWorks, 2016). A long-term adaptive approach that incorporates environmental changes may be more favorable than the permanent nature of easements and other USDA wetland contracts (Prezioso, 2025; Tully & Gedan, 2025). Previous research advises “greater flexibility in future program design, perhaps offering shorter contracts, ability to specify a contractor, greater say over site design, etc.” (OpinionWorks, 2016).

This raises challenges for governments: how to permit site-specific plans, monitor their implementation, and still allow them to evolve over time (Coleman, 2025). As environmental conditions change, implementing a plan—such as invasive species management—can be costly and require significant labor (OpinionWorks, 2016; Sudol et al., 2023).

What role do cultural and sociological differences play?

Geography shapes policy decisions, influences cultural identity (or sense of place), and is often linked to certain demographic characteristics. As a result, different regions—and the people who live there—may respond differently to conservation messages, priorities, and approaches.

County and lower-level governments reveal different growth management attitudes, and their policy is constrained by staff capacity (The National Center for Smart Growth Research and Education, 2017). This leads to several questions that may provide context about landowner attitudes and abilities:

- What are the population projections for the target geography? (The National Center for Smart Growth Research and Education, 2017)
- What are the causes of land conversion? What are key trends in the local agricultural industry? (The National Center for Smart Growth Research and Education, 2017)
- Are there growth management strategies in place, with community buy-in, that favor wetland conservation? (The National Center for Smart Growth Research and Education, 2017)
- Is there sentiment that larger-scale infrastructure could benefit the community? (The Nature Conservancy & Equival Partners, 2024)



Practitioners who work with private landowners relayed that waterfront property owners are often white, affluent, single-family homes, and retirees (Gould, 2025; Murrell, 2025; Prezioso, 2025). In Virginia, during the COVID-19 pandemic, Wetlands Watch observed an influx of new waterfront property owners moving from urban to rural areas. Virginia also experiences military-related turnover, which sometimes means new property owners do not have a deep understanding of how their property floods or the value of wetlands (Hughes & Stiff, 2025). Some landowners are more environmentally sensitive and receptive to living shorelines, while others have different expectations for their waterfronts. Property owners may believe they will overcome natural shoreline dynamics with various engineering approaches, which is not always the case (Hughes & Stiff, 2025; OpinionWorks, 2016).

Inland property owners are experiencing marsh migration. These communities often comprise strong African American populations and occupy lower socioeconomic brackets. The government’s “historic deafness” to the concerns of African American communities has led to distrust and the perception that wetlands are valued over community priorities—which may exacerbate the exclusion of their voices from the decision-making process (Van Dolah et al., 2020). Historically, Indigenous people have also been removed from their lands and their voices have been neglected. Their relationship with the government as sovereign nations is still being actualized (Ehrenreich, 2025).

Considering Communication and Outreach

To achieve conservation goals on private property, partners—including policymakers, government agencies, nonprofits, and contractors—must align their objectives with a property owner’s priorities and preferred communication methods. Literature and interviews highlighted knowledge gaps among property owners and how partners have learned to build successful relationships.

Are landowners aware of existing resources?

Existing resources for wetland conservation may be underutilized due to a lack of awareness among property owners. Landowner awareness of existing resources can be grouped into these categories:

<p>UNAWARE</p>	<p>Many sources relayed that landowners are unaware of wetlands programs, informational materials, and other resources. Agricultural landowners are often aware of USDA’s Conservation Reserve Enhancement Program (CREP) but are not familiar with other wetland programs (OpinionWorks, 2016). <i>Wetlands Work</i> is a website dedicated to sharing information about wetland programs, but public awareness of this resource is assumed to be low (Lawal, 2025). Many groups expressed a need to more broadly promote the benefits of wetlands (Hughes & Stiff, 2025; Lawal, 2025; The Nature Conservancy, 2020). The strategic question for practitioners is whether to focus on outreach to individuals or try to broadly spread knowledge.</p>
<p>AWARE but in need of technical assistance</p>	<p>Some individuals and communities are seeking solutions to flooding or erosion problems or desire more wetlands but do not know who to turn to for help (OpinionWorks, 2016; Sudol et al., 2023). Living shorelines, easements, and other restoration strategies are often complicated, multi-step processes that require external funding or partnerships. Having a contact with expertise is often essential (Chesapeake Bay Program, 2022). Landowners in this group need to be approached or directed to the right resource.</p>
<p>AWARE but in need of explanations for policy decisions</p>	<p>Some landowners are aware of practices or policies but do not understand the reasoning. When things “don’t make sense,” it can erode trust and relationships. For example, one landowner expressed: “Well, I got several ditches, and you’re not supposed to cut from April to August in the ditches because of, I don’t know why.” (OpinionWorks, 2016).</p>
<p>AWARE but in need of greater scientific understanding</p>	<p>The ecosystem services wetlands provide, such as carbon sequestration, may convince landowners to conserve or create wetlands on their property. However, those services can be complex and difficult to observe. One farmer mentioned that he is not opposed to things backed by good science, and others shared how they want to see a tangible difference (OpinionWorks, 2016). Kate Tully’s lab has soil-carbon-salinity studies to compare conditions before and after a restoration project. Along the same lines, Community Outreach and Engagement Forum (COEF) members emphasized the need for data accessibility, more data collection, and sharing data in ways that are easy to understand.</p>

The overall lack of awareness of wetland conservation resources may be a function of partner outreach capacity. What is their strategy to reach key audiences? What communication methods do they use? Are they able to reach all the people they want to reach? As Wetlands Watch proclaimed, “No one is fully engaged to the extent they need to be.”



How can practitioners build relationships with landowners?

The literature and interviewees offered the following guiding questions and best practices for building trusting relationships with landowners.

GUIDING QUESTIONS

(The Nature Conservancy, 2024)

QUESTION 1

Who are the people who have lived in and had a relationship with the land in the past, present, and future? Have we done the work to understand this?

1

2

QUESTION 2

Have we visited the communities we serve and organized events where people can get to know one another and provide input on the decisions that will impact them?

3

QUESTION 3

Have we built the conditions for psychological safety, deep dialogue, and difficult conversations? Do we go straight to a task, or do we tend to the relationships in a group that is coming together to complete a task?

4

QUESTION 4

Do all interested parties see and value each other as equals? Have you established a two-way knowledge sharing system?

Best Practices:

- **Ask questions:** Partners should always lead with questions when interacting with other agencies or the general public. They should seek to understand the perspectives and needs of others before pushing their own messages. A helpful question to begin with is: what concerns you about the quality of your community? (The National Center for Smart Growth Research and Education, 2017).
- **Be responsive and accessible:** Engagement may occur with delayed or no follow-up. This seeming lack of transparency can lead to frustration and disengagement (OpinionWorks, 2016; The Nature Conservancy, 2024).
- **Interact informally:** Authentic, informal interactions, such as meals, coffees, parties, birthday celebrations, and other face-to-face activities, can add joy and laughter, helping to build rapport (The Nature Conservancy, 2024).
- **Consider language and shared terminology:** Some terms—such as wetland and living shoreline—require clearer definitions to specify what qualifies as each (The Nature Conservancy, 2024). Some words or terms have strong connotations that may be worth addressing or avoiding. For example, Audubon found that, rather than discussing the causes of climate change, their outreach should focus on collective concerns and protecting habitat. Focus on language about what can be done rather than why others should share the same beliefs (Bellman, 2025).
- **Share potential risks:** Understand and own them. Remove related misconceptions (The Nature Conservancy, 2024).
- **Celebrate successes:** Recognize that “what gets celebrated gets done.” Seek out and recognize the bright spots in a good relationship. Provide rewards and other incentives to reinforce trust-building success. Seek to profile good examples of our work together in the news. Share credit widely (The Nature Conservancy, 2024). The Elizabeth River Project’s example of displaying River Star Home flags on properties and holding recognition ceremonies shows this recommendation in action (Murrell, 2025).

- **Avoid fatigue:** Some groups are repeatedly approached for research and implementation. They experience survey fatigue and are often not compensated for their time. It is important for organizations to talk to one another in order to avoid redundant conversations (Bellman, 2025; The Nature Conservancy, 2024).

Ultimately, a landowner “only has to have one bad experience” (OpinionWorks, 2016). One bad experience may erode or sever a relationship, and could also spread as a cautionary tale among a landowner’s peers. It is crucial to recognize past experiences and make every effort to be honest and transparent to avoid creating a bad experience in the future. Likewise, good experiences create powerful local champions and program ambassadors (Chesapeake Bay Program, 2022).

Where do landowners fall on the “willingness spectrum”?

Several interviewees described a common approach of opportunistically pursuing projects on private property—focusing on landowners who already align with conservation goals. These are individuals who are environmentally conscious and motivated to install living shorelines or establish conservation easements. Programs run by Maryland Department of Natural Resources, Elizabeth River Project, Eastern Shore Land Conservancy, Natural Resources Conservation Service, and Middle Peninsula have built enough visibility that they expect to attract interested landowners or already have waitlists. This suggests that some people place intrinsic value on wetlands; once they understand the importance of wetland conservation and maintenance, they are likely to take initiative and seek out opportunities (Chesapeake Bay Program, 2022; Lawal, 2025).



There may be enough “interested” landowners to justify continued focus on this audience. However, those “harder-to-reach” landowners may play an important role in meeting wetland acreage goals and maintaining wetland connectivity. These audiences may be resistant to engage with partners due to previous bad experiences or because they prefer another landscape over wetlands (Hughes & Stiff; OpinionWorks, 2026; Van Dolah et al., 2020). New strategies may be needed for these harder-to-reach landowners. For example, working on inland marsh migration corridors may introduce a new demographic—such as minority groups with smaller land parcels. This means building new relationships with trusted messengers and considering alternative management strategies, as easements work best on larger parcels (Heyn, 2025; Van Dolah et al., 2020). Working on parcels dominated by turf and gray infrastructure may lead to pushback from the turf industry or marine contractors who may favor bulkheads or revetments (Gould, 2025; Hughes & Stiff, 2025).

Are the “low-hanging fruit” audiences well-engaged? Should more attention be given to the next tier on the willingness spectrum? Alternatively, do we need to invest more resources in the current strategy to reach its full potential?

What are the best methods for communicating with landowners?

In most cases, living shorelines, conservation easements, and other management plans are complex and site-specific enough to require one-on-one technical assistance (Chesapeake Bay Program, 2022). Peer-to-peer communication and word of mouth have also proven to be effective strategies. However, this level of personal engagement usually depends on initial outreach efforts to raise awareness among landowners.

One-On-One with Technical Experts

Technical experts, or the “midstream” audience, connect the downstream landowner or implementer with knowledge, programs, and resources (OpinionWorks, 2016). The literature and interviewees emphasized the need for a one-on-one relationship with a technical expert to:

- 
- 1** Build landowner confidence by having an “inside” person “in their corner” to help navigate the process, which is often site-specific (The Nature Conservancy, 2024; Heyn, 2025).
 - 2** Help a landowner understand their options and provide a space for negotiation (Heyn, 2025).
 - 3** Give landowners a single point of contact who knows it all. “Instead of going to five different agencies, what kind of programs are available if I want to turn my woods into a wetland?” (OpinionWorks, 2016).
 - 4** Keep landowners engaged through multiple steps over a potentially long period of time (Chesapeake Bay Program, 2022; Heyn, 2025).
 - 5** Connect landowners with other contacts or resources (Gould, 2025).
 - 6** Lead to improved chances of funding success (Chesapeake Bay Program, 2022).

Some communities will not welcome overtures from messengers they do not already know and trust (OpinionWorks, 2016). Trusted messengers have prolonged and regular interaction with their audience (Tully & Gedan, 2025). Often, a trusted messenger is a local nonprofit group with a good reputation in the community. Some landowners prefer to have a buffer, such as a nonprofit land trust, between them and the government (OpinionWorks, 2016). It is even better when those groups bring financial resources (Peabody, 2025). Site visits also show individual attention (Heyn, 2025).

Entities—often contractors or nonprofit organizations with the capacity to carry out projects—build trust when they help fulfill a property owner’s goals (Peabody, 2025). Contractors were often cited as trusted messengers and important conduits to landowners. Contractors may need targeted education and training and could help distribute wetland conservation information to landowners. Chesapeake Bay Landscape Professionals contribute to this need (Gould, 2025; Hughes & Stiff, 2025; Peabody, 2025). Landowners want to be connected to “qualified contractors,” and conservation partners want to connect landowners to qualified contractors (Chesapeake Bay Program, 2022; Gould, 2025). The Elizabeth River Project establishes a pipeline to guide landowners through permitting, contracting, design, and installation. This model has been well-received (Peabody, 2025).

As described earlier, government distrust is active among farmers and historically underserved groups. Residents may also be fearful of fines or citations. However, some individual government agents have been recognized as trusted messengers (Van Dolah et al., 2020). One farmer stressed the need for government representatives to have “common sense.” The Maryland Department of Natural Resource’s (DNR) technical assistance program has perceived trust from their clients, because clients initiate first contact, and DNR is not trying to sell or profit from the interaction (Gould, 2025).

When it comes to project design and implementation, community members want to be seen as *partners and experts* in the eyes of the government and private sectors—not as people to be informed after decisions have already been made (The Nature Conservancy & Equival Partners, 2024).

Technical assistants are valued for their knowledge but may fall short of expectations. An “expert” may not have knowledge of all available programs and resources (OpinionWorks, 2016; The Nature Conservancy, 2020). They may not be fully aware of useful landowner contacts or of overlapping, and sometimes conflicting, efforts by other partners (Bellman, 2025; Heyn, 2025).

One-on-one interactions require significant time and resources, and capacity is often limited at both the individual and organizational levels. About one in five landowners (18%) have “had a visit from an expert to discuss the possibility of preserving wet areas on your farmland or restoring them to natural habitat” (OpinionWorks, 2016). The Nature Conservancy (TNC) estimated that assisting seven people—including conversations and travel time—took 212 hours, or 30 hours per person. TNC also shared that the time between initial contact and a first site visit is “much longer than we would assume.” It can take months to schedule a site visit. This one-on-one approach requires significant up-front labor, and landowners may not follow through with a restoration project. While the relationships formed are still valuable, organizations often have small staffs and quickly reach their capacity for outreach.

Given these constraints, providing more technical assistance may be the most effective but least feasible solution.

“The Nature Conservancy estimated that assisting seven people—including conversations and travel time—took 212 hours, or 30 hours per person.”

Peer-to-Peer Communication and Influence

Family, neighbors, and local ambassadors can have a major influence on a landowner’s decisions about their property (Chesapeake Bay Program, 2022; The Nature Conservancy, 2020). Peer-to-peer communication is a “make-or-break” opportunity to sway landowners toward or away from conservation programs (Hughes & Stiff, 2025). Word of mouth is key to spreading awareness, including when landowners speak to partners about other landowners who may be interested in wetland restoration, creating a snowball effect (Chesapeake Bay Program, 2022; OpinionWorks, 2016; Sudol et al., 2023).

Local ambassadors can help share success stories and resources, including through open houses, tours, and demonstrations (Chesapeake Bay Program, 2022; Hughes & Stiff, 2025). Custom home builders and real estate agents are underutilized

messengers. They are in a position to explain shoreline dynamics and design features, promote living or natural shorelines, and set expectations for maintenance (Hughes & Stiff, 2025).

Apart from training and equipping influential peers, partners also recommend establishing peer or community networks. This may include facilitating regular meetings, workshops, or online forums to share best practices, challenges, and lessons learned (The Nature Conservancy, 2024). Consider creating a knowledge-sharing platform or resource library accessible to all (The Nature Conservancy, 2024).

One interviewee noted a research gap related to collective action and group decisions: what are the strengths and limitations of this decision-making process? (Tully & Gedan, 2025).



Utilizing Partners

Initial outreach may take the form of individual appeals, group outreach events, or more passive methods like posting information in public areas and online. A focus group with rural farmers suggested that “this is a busy audience and hard to reach. By and large, most [farmers] were not overly digitally inclined and not very phone responsive. Traditional mail and in-person contact remain the best ways to interact with this audience.” (OpinionWorks, 2016). The Nature Conservancy and the Maryland Department of Natural Resources (DNR) have used mailers and postcards to reach high-priority contacts (Coleman, 2025; Heyn, 2025). Partners also use email surveys to inform their outreach strategies. However, this can lead to audience fatigue if multiple groups are sending similar surveys (Bellman, 2025; Heyn, 2025).

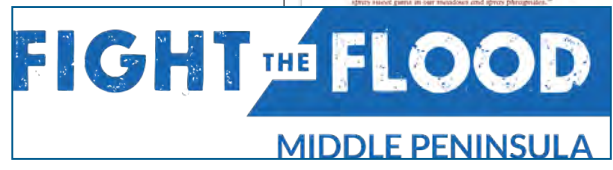
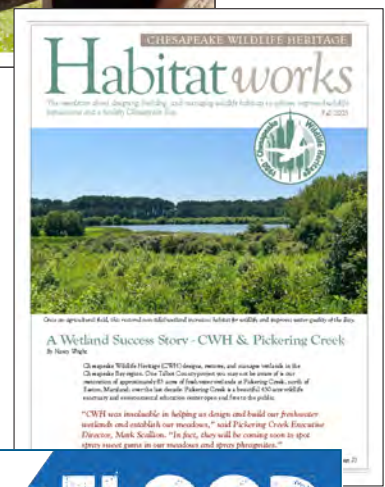
The Elizabeth River Project (ERP), Audubon, and DNR use online webinars and in-person meetings to reach people. These include presentations, open dialogues and participatory mapping exercises, and tabling at civic events, festivals, and boat shows (Bellman, 2025; Gould, 2025; Murrell, 2025). These events self-select for people who are already receptive to environmental messaging. ERP has had success with these types of events, with more than 7,000 sign-ups since 2011. However, they expressed the need to think of new ways to reach beyond these audiences (Murrell, 2025).

Literature indicates that Bay residents rely on hyper-local news sources like local papers and well-circulated newsletters, such as *Delmarva Farmer* or Chesapeake Heritage’s *Habitat Works* (Chesapeake Bay Program, 2022; OpinionWorks, 2016). Flyers and pamphlets are useful tools, and graphics can be highly effective tools for conveying information (Hughes & Stiff, 2025). However, we lack data on their impact and effectiveness.

The same is true for websites. For example, the *Wetlands Work* website was established as a one-stop-shop for information about wetland benefits, programs and resources for wetland restoration, helpful contacts, and success stories. The Chesapeake Bay Program tracks website traffic and observed about 8,000 users visited the website from 2024-2025, with 27% of them located in the watershed. Much of that traffic was from organic search results, meaning traffic from search engines like Google, as well as from links on the Maryland Department of the Environment’s website. The *Wetlands Benefits* and *Building Your Wetlands* webpages were the most-visited (Lawal, 2025). However, we don’t know what actions, if any, users took after visiting the website. While important, this website requires ongoing maintenance to ensure information is up to date and would benefit from more strategic promotion and metrics to better measure success (Heyn, 2025; Lawal, 2025).

The Middle Peninsula’s *Fight the Flood* website is another hub of information for homeowners, contractors, and localities about water quality and flooding issues. It also serves as a database of relevant contacts and resources. Middle Peninsula is developing more marketing materials for the website. DNR’s Watershed and Climate Services division is updating its website to streamline resources and cater to the homeowner using plain language (Gould, 2025). Could other websites benefit from similar updates? Where is content lacking?

Overall, communication methods run the gamut, but most align with recommendations from focus groups and the existing literature.



Navigating Policy and Regulation

Policy determines which wetland management strategies are available to landowners and how those options are communicated. This section outlines best practices for sharing policy information, offers recommendations for policy revisions or new initiatives, suggests ways to improve policy design, and shares strategies for gaining community buy-in.

How do governing structures influence regulations?

Tribal Nations

Federally recognized Tribes and their priorities for ancestral lands should be prioritized in tidal wetland conservation planning. Federally recognized Tribes are sovereign nations with their own landholdings (or trust lands held by the United States), constitutions, and treaties with the US. Historically, Indigenous sovereignty has not been well respected and governments, partners, and Tribal members are still contending with how to fulfill treaty obligations and work within a complicated legal structure which was not co-created with tribes.

Tribal nations have greater authority than a typical stakeholder. Tribal nations must have a seat at the table and an opportunity to voice their vision and aspirations, which may include ways to give rights to rivers, habitats, or other ecosystems. Because Tribes have historically been excluded from these discussions, the first step should be to establish partnerships and ensure they are represented. Incorporating their knowledge and priorities should follow (Ehrenreich, 2025).



State Policies

State policies also impact wetland conservation practices. Virginia, for example, is a Dillon Rule state, meaning local governments only have the powers specifically granted to them by the state. Most Virginia wetlands are in private ownership. Maryland, on the other hand, is a Home Rule state, meaning local jurisdictions may enact land-use regulations provided they do not conflict with state or federal regulation. The state owns all the open-water and vegetated wetlands below mean high water (The National Center for Smart Growth Research and Education, 2017; Clean Streams, 2025).

State policy can structure incentives and support economic viability for desired land-use practices. For example, states could adopt the National Flood Insurance Program's Community Rating System, which provides financial incentives for local governments to conserve wetlands within floodplains (Hughes & Stiff, 2025). However, local governments and nonprofits sometimes come to rely on state funding sources, which can be vulnerable to changes in administration (The National Center for Smart Growth Research and Education, 2017). How states can ensure steady and reliable funding may be a top priority for local partners.

Dillon Rule State (Virginia)

Local governments only have the powers specifically granted to them by the state.

Home Rule State (Maryland)

Local jurisdictions may enact land-use regulations provided they do not conflict with state or federal regulation.

States also implement their own programs and regulations. Transparent criteria and defined processes are key for decision making, such as selecting a parcel for a conservation easement. While this can help with selection justification, it may also reduce flexibility (Coleman, 2025). However, when discretionary structures are put in place, they invite inconsistencies.

In Virginia, the implementation of regulations is at the discretion of local Wetlands Boards. Where no local authority exists, Virginia Marine Resources Commission (VMRC) carries out enforcement on a case-by-case basis based on the conditions, evidence, and issues at each site (Clean Streams, 2025). Maryland's Living Shorelines Waiver process also demonstrates the challenge of balancing competing stakeholder interests. Are there too many waivers or too few? Living shorelines can be engineered in many areas but come with shifting price tags, and feasible costs may vary by situation (Gould, 2025). While constituents value fairness, it is difficult to find a solution that satisfies everyone. When flexibility exists, stakeholders may complain of inconsistencies or disagree with decisions.

Local Governments

Local governments design and enact most of the land-use regulations that dictate how a region can grow and develop. They have the power to provide incentives to property owners to facilitate both conservation goals and growth (The National Center for Smart Growth Research and Education, 2017). Virginia's Middle Peninsula states that it is their responsibility to protect the community, tax base, and water quality—interests that may seemingly compete with each other at times (Peabody, 2025). A local government's constituency and capacity determines what policies are created or fully implemented (The National Center for Smart Growth Research and Education, 2017).



Wetlands Watch emphasizes the need for people at the local level to advocate for regulations or persuade private property owners, developers, and shoreline contractors to conserve wetlands (Hughes & Stiff, 2025).

Wetlands Watch, the Maryland Department of Natural Resources, and the Elizabeth River Project all provided comments on local staff capacities: Some Soil and Water Districts are well-staffed and responsive, while those with less capacity require more time to process permits. Some areas have fewer nonprofits and opportunities to use technical assistance programs. Likewise, the tools and outreach materials available to private property owners and developers, such as mowing guidance, vary between local governments (Clean Streams, 2025). The actions local governments choose to take may, in part, rely on the state of the science. For instance, it is unclear if wetland mowing is pervasive enough and sufficiently detrimental to prioritize staff time and department budgets to prevent it (Clean Streams, 2025).

Why do some policies cause conflict?

Incompatible Policies

Some existing policies appear to conflict with conservation goals or rest on debatable science, including:

- Maryland's Critical Area Commission begins landward of the mean high-water line. "One cannot help but notice that there is disconnect between the intensity of vegetation management oversight required within the 100-foot buffer and 1,000-foot critical area, while the very tidal wetland ecosystem this program intended to protect is afforded essentially no protections from despoilation. Why is vegetation management in the 100-foot buffer controlled, while the tidal marsh it is meant to protect is free to be mowed?" (Clean Streams, 2025).
- In Maryland, is there a difference between the impacts of shading or smothering by a pier under 3 feet tall versus that of persistent mowing? (Clean Streams, 2025).
- The control of exotic plant species, such as *Phragmites australis*, does not require a permit, but replanting with native wetland vegetation to prevent erosion after the fact is not required according to the code (MD). Planting natives after the fact would also require a permit, as that would be considered filling a wetland (Clean Streams, 2025).
- In Virginia, the ability to mitigate off-site reduces incentive to preserve on-site, thereby creating the possibility that all wetlands could be lost from the area or watershed (Hughes & Stiff, 2025).
- In Virginia, newer legislation effectively allows invasive species remediation to equal wetlands creation (Hughes & Stiff, 2025).
- Relying on science that suggests wetlands do not need to stay in place but could be of the same quality moving inland incentivizes management techniques, such as thin-layer replacement, that allow wetlands to persist (Hughes & Stiff, 2025).
- Permittees, such as the Virginia Marine Resources Commission, are reluctant to consider loose oyster shells in front of living shorelines because loose oyster shells are not held down. Therefore, it is not considered a living shoreline. This is a barrier because some properties have expedited permits but want loose oyster shell (Peabody, 2025).

Confusing Policies

The reasoning behind policies is not always clearly communicated, and once enacted, policies may seem counterintuitive to their original intent. This disconnect can lead to frustration and erode trust in the policymaker. Some examples include:

A farmer's reaction to a USDA conservation plan:

“But, oh, no. I could not do that. So they put two ponds. And now I've got two ponds, a bank, a ditch, and a wetlands. So now it took up more of my ground with their ideas versus mine. And they won't listen to common sense.” (OpinionWorks, 2016)



A second farmer's reaction to a USDA conservation plan:

“You need to come to my farm. Because the way you sapsuckers have put ditches through here there's no way that 100 foot, I can't build nothing! [crosstalk] I said, I can't. Well, when he come back it was a secondary ditch and it only had to be 25 feet away. So I got my barn.” (OpinionWorks, 2016)

Ambiguous Legislation

Some policies and regulations are ambiguous and open to interpretation. For example, current legislation implies, but does not explicitly state, that detrimental wetland mowing should be prohibited (Clean Streams, 2025).

Interviewees concur that mowing is a significant issue, largely due to a lack of awareness and education on how to maintain wetlands (Gould, 2025; Hughes & Stiff, 2025; Clean Streams 2025). “Landowners mow wetlands for a variety of possible reasons, including paths for access to piers/docks, to expand use for recreation purposes, space to make more storage, and/or personal aesthetics like maintaining a lawn-like landscape...The high marsh area is most likely to be accessible to homeowners with a lawn mower...However, tidal vegetated wetland grasses can be mowed down to mean low water by a determined individual.” (Clean Streams, 2025).

More research is needed to demonstrate the link between wetland mowing and degradation, and to determine mowing location and frequency. Even so, interviews suggest that ecologists and regulators believe mowing is harmful to wetlands and that property owners can improve wetlands simply by not mowing (Clean Streams, 2025).



Photo, Eric Buehl, University of Maryland Sea Grant Extension

Interviews comment that mowing, especially of *Spartina patens*, is common on residential properties (Gould, 2025). One interviewee had not observed mowing on agricultural lands, while another reasoned that mowing of wetlands on larger rural properties would have a greater impact than mowing on piecemeal urban properties (Hughes & Stiff, 2025; Tully & Gedan, 2025).

When developing policy, it's key to distinguish between where mowing occurs—along the waterfront or inland—and the demographics tied to those landscapes. There may be high-income, waterfront property owners willing to absorb fines in order to maintain a mowed, turf-like landscape. In contrast, there may be inland landowners with little recourse to manage the shifting ecological conditions affecting their home and property.

How can policy design and rollout be improved?

Lessons learned for better policy design and rollout include building awareness, communicating with stakeholders, simplifying when possible, revising funding allocations, and monitoring and evaluating results.

Building Awareness

People impacted by a policy or funding opportunity must first be aware of it in order to respond. Jurisdictions need to anticipate and budget for building awareness. Policymakers also need to leave time between policy adoption and implementation to allow the public to adapt to the new policy environment (The National Center for Smart Growth Research and Education, 2017). This time should be spent educating the public. New tools are likely to lead to a high volume of questions and applications. Staff time should be allocated to quickly process requests and answer questions. Response time is important to maintaining positive relationships. Localities advise that community engagement is the largest necessary expense and that adequate staff resources are needed to review plans and regulations (The National Center for Smart Growth Research and Education, 2017). Given struggles with staff capacity, thinking critically about the awareness-building step can help avoid public fallout and lead to smoother policy implementation.

Communicating with Stakeholders

A lack of responsiveness and transparency—especially regarding the outcomes of resource programs like grants and easements—has become a major barrier for those impacted by these policies. For example, grant seekers who have been rejected multiple times without adequate explanation stop applying for grants. Farmers also shared that they often do not receive updates about potential projects in a timely manner, if at all (OpinionWorks, 2016; The Nature Conservancy, 2024). It is important to have debriefing sessions and feedback loops where parties can share challenges and successes or anonymously report on their experiences, particularly recipients to funders and funders to recipients. Policymakers and funders should commit to addressing the issues voiced by stakeholders and “do what you say you’re going to do” (The Nature Conservancy, 2024). Again, building a trusting relationship with stakeholders is essential, but it also requires time, funding, and commitments from agencies that may already lack capacity for outreach.



Photo, Logan Billbrough, University of Maryland Sea Grant Extension

Simplifying When Possible

Confusion is a disincentive to engage in a process or trust a partner. Unclear or excess guidance can create an overwhelming sense of complexity that often leads to inaction (The Nature Conservancy, 2024). State and federal processes that are hard to understand—for example around Maryland climate goals—also make it difficult for communities to see themselves reflected in a policy’s vision (The Nature Conservancy & Equival Partners, 2024). Therefore, it is crucial to keep policy design and public engagement simple, while including enough detail about policy structure and enforcement. Vagueness can lead to confusion and anxiety about what will happen, and likely decrease support for the policy.

Conversely, jurisdictions have been guilty of producing thick reports with hundreds of action items that are difficult to digest and implement. Concise plans with smaller sets of “catalytic goals” can help with ease of understanding and quicker, more responsive implementation (The National Center for Smart Growth Research and Education, 2017). Similarly, when multiple funding programs exist with similar names but different functions and requirements, it is challenging for both landowners and the technical assistance providers to organize and standardize information (Heyn, 2025; The National Center for Smart Growth Research and Education, 2017).

Technical requirements in policy design, especially for funding, aid programs, and permits, can deter potential applicants. One interviewee shared how the permit review structure at the Maryland Department of the Environment has more of an urban development lens than an ecological restoration lens. This generates questions and unknowns, further slowing down the process (Bellman, 2025). Apart from the timespan and seeming inflexibility of the permit process, other technical requirements for grants appear so onerous that some landowners and communities will not even apply (The Nature Conservancy, 2024).

Revising Funding Allocations

Two main themes emerge around funding:

- Funding should be more inclusive in terms of who and what receives support.
- Funding should be more sufficient and steady to meet long-term needs.

Administration of funds, such as reporting and auditing, is costly and burdensome (The Nature Conservancy, 2024). Funding agencies also express being under-resourced and overwhelmed. As a result, funds get pushed out the door before there is time for cross-agency collaboration across issues like healthcare, economic development, safe living spaces, and education. (The Nature Conservancy, 2024).

When considering funding options, we should ask, “Have we designed processes and methods that remove barriers to participation?” (The Nature Conservancy, 2024). For example, technical requirements, such as the use of certain screening tools, can place the burden on applicants to show how “disadvantaged” they are (The Nature Conservancy, 2024). “Does the decision-making process invite all interested parties to participate with equal voice and equal power?” (The Nature Conservancy, 2024).

The desire for projects with environmental *and* socioeconomic/livelihood components is echoed in community feedback that: ecosystem benefits are prioritized over community benefits, financial and scientific considerations weigh more heavily than social considerations, and experiential knowledge and lived experiences are valued less than institutional or scientific knowledge (The Nature Conservancy, 2024). Creating cross-issue proposals may require more planning, but less money is usually available at the planning stage (The Nature Conservancy, 2024).

Programs designed to provide funding for private property owners may need revision if they are to help meet wetland goals. For example, the Maryland Department of Natural Resources offers grants and loans for private properties. However, grant criteria and/or reviews within this system tend to favor shared or community spaces. While offering financial assistance in



Shoreline Resiliency Project in West River, Maryland. Photo, Tom Nappi, MDGovPics

the form of a loan may enable some property owners to install living shorelines, repaying a loan may be cost-prohibitive. As a result, more affluent groups, often demographically white and retired, tend to receive loan funding. Equity becomes tough to achieve within this system (Gould, 2025).

While loans are one mechanism to promote living shorelines, other tools like grants may be necessary for a more equitable distribution of projects. In some cases, individual private properties are ineligible for funding programs (Gould, 2025), and as a result, community living shoreline projects get funded.

Overall, more sufficient and reliable funds are needed. It is imperative to invest the necessary resources into a program at the policy creation stage; do not initiate a program if there are no funds to implement it (The National Center for Smart Growth Research and Education, 2017). Across the Chesapeake Bay watershed, jurisdictions often fund conservation programs through landfill tipping fees, which may be a more secure source of funding (The National Center for Smart Growth Research and Education, 2017).

Community Outreach and Engagement Forum (COEF) suggestions for funding pathways include leveraging funds available from the US Army Corps of Engineers for technical assistance, applying for resilience funding under the Whole Watershed Act in Maryland, local governments working together to utilize private sources of funding, and partnering with state agencies for infrastructure repair projects (The Nature Conservancy & Equival Partners, 2024).

To better navigate the funding landscape, local jurisdictions and state agencies should synchronize grant applications and other program implementation steps that require cross-agency collaboration.

Monitoring and Evaluating

“What’s happening?” and “Did it work?” are two common questions that often go unanswered both at the ecological and programmatic levels. Many federal and state agencies and public and private institutions collect data, but the gap between when and where information is collected and how it is shared requires attention (The Nature Conservancy & Equival Partners, 2024).

As wetlands react to climate change, long-term monitoring is necessary to understand their performance and conservation efforts. What is happening on wetlands, especially on private lands? Restoration projects, as well as easements, also require health check-ups. A small, mobile crew of volunteers, practitioners, or seasonal staff could visit and assess sites and support project needs (Bellman, 2025).

Further evaluation of funding and policy effectiveness can help identify necessary revisions. However, there appear to be limited avenues to disclose problems or have candid conversations with funders about the ease or inclusiveness of the application process (The Nature Conservancy, 2024). COEF suggests committing to creating public impact reports, where monitoring and evaluation activities include workshops on impact measurement, access to relevant tools, and assistance with data collection and analysis (The Nature Conservancy, 2024). Panels evaluating funding should assure community members have a voice in funding decisions (The Nature Conservancy, 2024).

While often unfunded, monitoring and evaluation are necessary to inform effectiveness, and the picture is incomplete when community voices are not included.

What should policymakers consider when revising or creating policies?

Co-Creation of Policy

Community Outreach and Engagement Forum (COEF) and farmer feedback highlight the lack of opportunities for residents—and farmers in particular—to participate in decision making, pointing to this as a key area for improvement. Which funding programs have been co-designed with the communities and individuals they impact? (The Nature Conservancy &



Equival Partners, 2024). On agricultural lands especially, collaboration with farmers and coordination across agencies may be key. A holistic approach—such as combining subsidies with market forces—may be more effective for properties with features like wetlands and buffers that ultimately prolong crop productivity upslope (Tully & Gedan, 2025). Mechanisms like Agricultural Advisory Commissions, such as the one in Kent County, Maryland, can provide checks on policymaking. These, along with place-based community groups like Envision the Choptank, could serve as an avenue for co-production with engaged community members.

At the same time, entering conversations with a “blank slate” approach can be unproductive. A case study from Lake Tahoe showed that approaching the public with an open-ended policy question can create too much debate and make it difficult to build consensus around a final policy proposal. The interviewee recommended bringing a draft policy to the public and asking for comments (Lake Tahoe; The National Center for Smart Growth Research and Education, 2017). Ideally, this approach leads to greater public support and buy-in, which in turn builds political will among elected officials.

Punitive or Incentive?

Many policies fall into two categories: punitive—such as restrictions or regulations with penalties if violated—and incentive-based, including monetary rewards, tax relief, or fast-tracked processes. Interviewees were asked if punitive or incentive measures were more effective.

Punitive measures, such as the Clean Water Act and living shoreline mandates, have proven useful (Peabody, 2025; Tully & Gedan, 2025). Based on the success of living shoreline mandates, treating wetland-friendly features as a default option has also been recommended. If violations are rare, penalties can also be effective (Clean Streams, 2025). However, several cautions were relayed regarding the use of punitive measures. Regulation enforcement seems to be a major barrier. How are policies enforced, who reports infractions, and how are they verified? (Clean Streams, 2025; Coleman, 2025). Is enough monitoring available to distinguish between accidental damage and purposeful, repeat offenders? What happens once damage is done? If the cost or penalty is not significant enough, offenders may simply pay to do what they want (Hughes & Stiff, 2025). This seems to be the case when a fee-in-lieu is too low to cover damage to a marsh; in one instance a fee had to be raised from \$70,000 to \$90,000. This contributes to the perception that blatant policy violations are often met with minimal consequences, and those who should be held accountable for their actions are overlooked.



Photo, Arundel Rivers Federation

While holding individuals accountable seems fair, clear communication is critical to buy-in for punitive measures that are proposed with plans for enforcement. There is a common sentiment that landowners, especially in rural areas, do not like to be told what they can and cannot do on their property—a scenario that often results in pushback (Prezioso, 2025; Tully & Gedan, 2025). For nonprofits or partners trying to build community connections, incentives often work better because they create a positive approach (Peabody, 2025). One interviewee stressed that punitive measures are more appropriate at national and state levels than at county or lower levels, because landowners do not want to be singled out (Tully & Gedan, 2025). Incentives are more typical at the local level, and punitive measures would be something new to adapt to (Prezioso, 2025). The law must be very clear before any punitive measures go into effect (Clean Streams, 2025).

Many interviewees feel the stick only works when followed by the carrot. If a landowner is told they must install a living shoreline, adding that there is funding available and experts to help guide them through the process makes that conversation easier. Similarly, streamlined permits, technical assistance, and financial support make the change more palatable and feasible. In other words, it must be easy for landowners to choose the conservation practice.

The literature and some interviewees expressed that a healthy marsh is incentive enough and a community committed to protecting their marsh is more impactful (Clean Streams, 2025). Ideally, we could get to a place where policy does not need to dictate wetland conservation. This was countered by some comments, “It’s nice for the water quality and everything else, but he’s not going to go broke doing it. You’ve got to have that incentive,” and “There’s only one carrot, and it’s money,” because that is a farmer’s bottom line.

Revising Legislation

Partners in Virginia cited specific legislation and regulations that could be improved:

- **The Virginia Conservation Assistance Program (VCAP)** is a state program that supports conservation on private property, providing a 70-80% cost-share. For marshes, there are specific and arbitrary cost-share parameters, which may complicate and slow the process (Murrell, 2025). The state should consider expanding VCAP for living shorelines and other best management practices, especially to private property (Murrell, 2025).
- **Virginia's Chesapeake Bay Preservation Act** preserves a 100-foot buffer inland of wetlands. This is potentially critical for wetland migration and protecting buffers. These buffer protections need to be enforced, especially as sea level rise creates a boundary that is shifting inland. A buffer that could be treated as a rolling easement, shifting inland over time, would meet an ecological need. But this approach lacks strong support at the state level (Hughes & Stiff, 2025).

Both Maryland and Virginia have policy needs related to wetland mowing, including a lack of state-wide guidance and educational or regulatory initiatives (Clean Streams, 2025). While mowing tidal wetlands likely alters their ecology, which is prohibited by Maryland and Virginia law, neither state actively prohibits mowing. This is because mowing is not considered “fill,” does not alter the root system, and does not chemically kill or remove the wetland (Clean Streams, 2025).

Revising Legislation: Easements and Agriculture Conservation Programs

Current agriculture policies need to consider sea level rise dynamics and the needs of farmers. Federal policies are not often designed with the realities of climate change in mind, relying instead on the assumption that conditions will remain static or stationary (Tully & Gedan, 2025). This expectation of permanence is not only ecologically unrealistic but also makes farmers uneasy. Volatile markets—such as current carbon markets, where it's unclear if payments are based on performance or carbon—appear too risky for many farmers. Some farmers hold similar reservations about contract lengths. Lifetime or 30-year commitments can be unattractive. Farmers expressed wanting their grandkids to ultimately have input on such a big decision. The terms of an easement may be seen as a long-term burden for future generations. Many farmers felt that six to 10 years was a more reasonable timeframe for contract length. Shorter contracts may also reflect the understanding that climate change will likely prompt a reevaluation or new management strategy within that timeframe.

Easements and conservation programs are also fraught with capacity and funding issues. The Nature Conservancy (TNC) has tracked about 70 steps between project engagement and implementation, which could take up to five years to complete. The Maryland Department of Natural Resources estimates about one year or more to complete a project. While TNC is researching this pipeline, they are considering where bottlenecks exist and where processes could be streamlined. They know cultural reviews take a significant amount of time, which can be difficult to explain to property owners. Once an easement is installed, more capacity issues emerge—mainly whether staff have the time and resources to monitor and enforce agreements. Offering higher pay for greater stewardship over a property could help, but this remains challenging under tight budgets (Coleman, 2025).

“The Nature Conservancy has tracked about 70 steps between project engagement and implementation, which could take up to five years to complete.”

Easement funding is also difficult to perfect, though some recommendations exist. Federal funding—such as the Farm Bill, the Land and Water Conservation Fund, the North American Wetlands Conservation Act, the Forest Legacy Program, and Endangered Species Grants—is often vital. However, these funding sources can be unstable, and their incentives may outcompete other market mechanisms. For example, the USDA's Conservation Reserve Enhancement Program (CREP) now allows landowners to permanently protect land through easements. CREP's evaluation system often results in higher payments per acre than traditional property appraisals. In contrast, US Fish and Wildlife Service programs rely on standard appraisals, which can lead to significantly different offers, especially in areas where land values are affected by climate change. For instance, properties

in Maryland's Cecil and Kent Counties may be valued at five times the price of those in Dorchester County, despite Dorchester properties having strong wetland conservation potential. If prices for easements are too low, landowners may not strike the deal (Prezioso, 2025).

CREP is also sometimes so generous that market forces, such as carbon, and other programs are no longer competitive (Newburn et al., 2025; Prezioso, 2025). Similarly, Transfer of Development Rights (TDR) programs may appeal to some farmers, but how prices are set depends on market conditions. If the real estate market declines, it is less likely a developer will need to build above baseline density to maximize profit. This would eliminate the market for a TDR program, rendering it ineffective. Montgomery County noted that development rights demand should be twice as high as supply. (The National Center for Smart Growth Research and Education, 2017).

Incorporating farmer input is one pathway to improve these programs. Agricultural Preservation Districts could serve as useful models: landowners commit to certain agricultural land uses, and in return, they receive legal protection against overly restrictive local regulations and nuisance complaints. They also gain access to funding streams available to properties within the program, and are often eligible for tax benefits, right-to-farm protections, and the ability to sell development rights (The National Center for Smart Growth Research and Education, 2017). Flexibility with contract lengths, requirements for invasive species control, and nuisance wildlife regulations could appeal to farmers and ultimately lead to more climate-adaptive landscapes.



Findings and Recommendations

The following recommendations draw from the literature, interviews, and the author's experience at Maryland Sea Grant. They consider the subject matter, intended audiences, appropriate outreach materials, potential action networks, community engagement opportunities, required resources, and longevity.

ISSUE:

Support for midstream technical assistants

Both the literature and interviews emphasized that while technical service providers are highly valuable, they are often overwhelmed and may not be fully aware of the wide range of wetland conservation programs and incentives available.

RECOMMENDATION:

Develop standardized, up-to-date materials for technical service providers to understand and navigate the full range of wetland conservation programs and incentives

The *Wetlands Work* website functions as a hub for landowners to find people and programs that can help them with wetland restoration. Technical assistants would benefit from these same resources if they were up-to-date. In tandem with maintaining this resource for technical assistants, partners could also develop a strategy to better promote the *Wetlands Work* website to landowners. Supplementing this with simple, accessible fact sheets for property owners would help increase awareness of available options and resources. Better-informed landowners could, in turn, reduce some of the demand placed on technical assistants.

Relatedly, homeowners are often looking for qualified contractors. To support this, midstream audiences—in this case governments and nonprofits that work living shorelines—need a handy, accurate list of contractors to recommend. Chesapeake Bay Landscape Professionals (CBLP) is primed to provide such a list, though care should be taken to remove bias.

The existing Delmarva Wetland Partnership (DWP) could become an action network for this work by expanding its scope to include tidal wetlands. If inclusive of other midstream audiences, DPW could also serve as a setting for collaborative learning and coordination among partners—leading to fewer redundancies and reducing survey fatigue among landowners. DWP's private landowner engagement team could organize trainings and meetings for technical service providers, while also soliciting their input on event formats that would meet community needs and amplify their efforts.

ISSUE:

Marine contractors need to be more involved in wetland restoration

Although Chesapeake Bay Landscape Professionals (CBLP) have made great strides in workforce training, they have only recently expanded their efforts to include tidal wetlands management and the marine contractor audience. The literature and interviews described the power marine contractors have to shape a homeowner's decision about their shoreline.

RECOMMENDATION:

Train more landscape professionals and marine contractors in best management practices for tidal wetlands

CBLP could serve as an action network and long-term steward of this work. In addition to help with training, the CBLP team can consult on the types of educational materials that contractors would find most helpful to share with clients—some of which may already exist via the Living Shoreline Outreach Campaign. As noted earlier, mowing is a key topic to address.

A database documenting the costs related to living shoreline installation would also be a useful resource for marine contractors. Costs can vary widely, and currently, there is more theoretical than hard data available. To measure success, the action network should evaluate key factors, such as whether contractors are applying what they learned, how many homeowners they engage with, and what on-the-ground changes result.

ISSUE:

Local government capacity varies

Local governments are powerful, key players in setting and enforcing policy. However, available staff, time, budgets, and local priorities can greatly differ from one area to another. This creates gaps and opportunities at the local government level for wetland conservationists to help develop education materials and other engagement strategies.

RECOMMENDATION:

Develop a suite of resources that local governments can use for outreach to their constituents

This effort could focus on a select number of local governments in areas that: are most vulnerable to sea level rise, have the lowest capacity but greatest potential for wetland conservation, already have conservation buy-in, or have more advanced initiatives and are tackling newer issues.

A suite of resources could be tailored to the needs of each region. For example, the Middle Peninsula—the only local government interviewed for this report—shared opportunities related to website content, particularly how to design automated messages around wetland guidance and resources that appear when website visitors access wetland-related pages.

In addition to print and digital materials, events could be tailored for local communities. It would be important to gather community input, beyond local government recommendations, on which event topics and formats would be most impactful.

An action network for this work could comprise local government representatives and wetland experts, such as those engaged in the Chesapeake Bay Trust's Tidal Wetland Strategic Plan steering committee. Local governments may be able to cover the costs of printing and distributing educational materials. Once foundational materials are in place, local governments would assume responsibility for continuing the work in their regions.

ISSUE:

Harmful wetland mowing practices

Although regulatory guidance and ecological understanding suggest that mowing wetlands can harm their integrity, the practice is not explicitly prohibited in Maryland or Virginia. Limited research exists to describe the detrimental effects of mowing, and the full extent of wetland mowing is unknown.

RECOMMENDATION:

Develop an educational campaign to discourage landowners from mowing wetlands

Waterfront property owners would likely benefit from general education on why mowing is harmful to wetlands. Existing landowner engagement efforts may have the capacity to develop and distribute educational materials on wetland mowing, especially in a digital format. Campaign materials could include fact sheets, website content, social media posts, presentations, and videos. These materials could be made available to states, localities, and nonprofits, and would be most effective if tailored to specific audiences. A localized approach is needed to understand how mowing impacts different regions.

There may be a sector of property owners with wetlands who would stop mowing if they learned why it is harmful. However, interviews indicated there may also be property owners, particularly in inland communities, who mow because they prefer a turf-like landscape (Van Dolah et al., 2020). As marshes migrate inland, landowners may not know how to manage the

changing landscape and may worry that the presence of wetland plants signals a decline in property value. This underrepresented audience has also voiced concerns that government policies prioritize wetlands over their homes. Managing wetland mowing on properties affected by marsh migration requires sensitivity, meaningful community engagement, and research-backed recommendations. If mowing is restricted, alternative management strategies that account for ecological needs and landowner preferences should be made available.

Forethought and care should be taken with this audience, and discussions should not be rushed. Partners could establish an action network consisting of living shoreline practitioners, Chesapeake Bay Landscape Professional administrators, and groups interested in marsh migration. The action network's budget should include support for community member participation and in-person meetings.

In addition to working with landowners, partnering with Chesapeake Bay Landscape Professionals could be an avenue for educating contractors about wetland mowing and how to design landscapes that incorporate wetlands. These contractors could also serve as messengers to promote wetland-friendly practices.

ISSUE:

Building awareness about the value of wetlands

Both the literature and interviews expressed the need to build awareness about the value of wetlands to Chesapeake Bay health. Resources describing the many benefits of wetlands are available to the public, such as the Living Shoreline Outreach Campaign and the *Wetlands Work* website, but few are tailored to specific audiences.

RECOMMENDATION:

Develop tailored messages about the value of wetlands for “hard-to-reach” audiences

Wetland values resonate with individuals differently and are hard to generalize by demographic group. Because people fall along a gradient—from those who value wetlands to those who do not—the most effective messaging must be tailored to specific audience segments. For example, how can wetlands be made more appealing to turf-loving, waterfront residents? Answering these types of questions may require consultation with local governments, nonprofits, and other trusted messengers who can home in on a targeted message that will resonate with a specific audience.

The Eastern Shore Land Conservancy (ESLC) offered one example of a targeted message: highlighting how much marsh is being lost to erosion and how quickly it is happening. ESLC is concerned that, for some marshes, the rate of erosion is outpacing the ability of wetlands to accrete or migrate inland. This type of “soundbite” could be a tool for ESLC to use when speaking to their audiences about wetland protection and restoration, as well as for strengthening grant applications. It would require research into the average erosion rates of marshes. Developing or updating similar concise, data-driven messages would be valuable to midstream audiences, such as technical assistants, who regularly communicate about the status of wetlands.



ISSUE:

Disclosure of wetland management information to homebuyers

While only one interviewee mentioned real estate agents, this author's own experience supports the idea that sea level rise and its effects on waterfront properties—such as the emergence of wetlands where not prevented by gray infrastructure or slope—are key concerns for prospective homebuyers. Neither Maryland nor Virginia currently offer a training program for real estate agents, and this author is not aware of any nongovernmental group offering this type of program.

RECOMMENDATION:

Develop a training that equips real estate agents with the knowledge and resources to educate homebuyers about the benefits of tidal wetlands

Real estate agents have the opportunity to directly connect with homeowners and educate them about shoreline dynamics, including the benefits of natural shorelines over gray infrastructure. Delaware and North Carolina offer sea level rise training for real estate professionals, which could serve as a model for similar programs in Maryland and Virginia. Training could introduce agents to existing shoreline management resources and equip them with educational materials tailored for homebuyers and sellers—including directories of marine contractors and landscape professionals who can help with project installation and maintenance. Real estate agents could also provide input on the content and design of these materials to ensure they are practical and accessible.

Partners could tap into new homebuyer courses, real estate conventions, and continuing education events to engage new audiences. An action network, including real estate professionals, nonprofits, and government partners, should be established to develop this training. Once foundational materials and programs are in place, a group from each state would need to assume responsibility for the program and keep the real estate industry engaged.

ISSUE:

Wetland protection policies do not meet the needs of farmers

This report demonstrates the friction that exists between current policy for wetland protection and farmers' struggles to manage their properties under changing environmental conditions. A lack of flexibility and adaptability frustrates and dissuades farmers from committing to programs that insist wetlands be achieved in a certain way—which sometimes conflicts with crop productivity goals.

RECOMMENDATION:

Using Agricultural Preservation Districts as a model, co-create a flexible suite of policies for tidal wetland conservation on agricultural lands

Agricultural Preservation Districts in states across the Chesapeake watershed allow various policy incentives for keeping agricultural land use. An updated version of these districts could incorporate climate change. The goal would be to develop a suite of policies that allow for a more holistic, mosaic approach to the landscape. Some of the most marginal lands become wetlands, and a buffer area is designed to help protect crops upland. When different environmental thresholds are met—using the rolling easement approach as a frame of reference—contracts and management plans can be reevaluated and could potentially trigger a new type of land use. Amendments or exemptions to current policies could be included to help farmers better manage their lands, such as allowing more nuisance wildlife management or some *Phragmites* persistence. Incentives could be associated with these districts, such as fast-tracking conservation programs or prioritizing ditch maintenance. A steering committee of farmers could drive how policies are designed. Ideally, this approach would enable conservation strategies that satisfy landowners and build trust.

Conclusion

Wetland conservation partners are successfully using best practices to conserve tidal wetlands. Because each living shoreline, easement, or conservation project involves technical hurdles, policy navigation, and considerable funding, every completed project is a victory. Even in ideal conditions, restoration work is time-intensive. Current capacity is limited by the number of technical assistants, staff time, and available funding. Climate change adds more complexity as shorelines become more dynamic and require more frequent or planned adaptation. Therefore, any additional focused outreach and engagement with private landowners on how to create, restore, and protect wetlands should be linked to existing initiatives. This report described those efforts and highlighted cultural insights, especially friction within the policy world, that impact landowner decisions. The hope is for this to serve as a basis for new outreach strategies that reach more landowners and help to advance tidal wetland goals in the Chesapeake Bay.



Living shoreline at Franklin Point, Maryland. Photo, Logan Bilbrough, University of Maryland Sea Grant Extension

Appendix

Methods

Findings generated for this report resulted from literature review and semi-structured interviews. Relevant reports were determined via resources accumulated in the Chesapeake Bay Trust Wetland Strategic Plan Steering Committee's Google Drive and research into available reports from active tidal wetland conservation agencies, though this is not an exhaustive list.

Reports were deemed relevant if they spoke to landowner engagement strategies for wetland conservation or land use (including coastal areas and wetlands) conservation strategies in the Chesapeake Bay watershed, particularly in Virginia and Maryland. Literature was summarized into a template that documented Organization, Project Name, Website Resources, Contact information, Target Audience, Geographic Scope, People Reached, Approach, Incentives to Participants, Funding Source, Outcomes, Challenges/Barriers, and Project Recommendations (realizing that the intent of some reports made some of these categories inapplicable).

Interview questions were designed around the gap analysis purpose (i.e., who to engage with, who is active in the field, what has worked, what else do they need) and informed by the literature review. Participants were recruited for interviews based on author awareness of government and nonprofit agencies participating in wetland conservation. A snowball approach also allowed for additional interviewees to be identified based on participants' recommendations. Interviews were generally confined to 30 minutes with the five same questions asked of all interviewees, as well as additional questions based on the flow of conversation.

The literature summaries and interview transcripts were then coded for themes based on the Landowner Engagement Request for Funding Proposal and other emergent themes. The coded data was further synthesized into the major themes and recommendations found within this report.

Literature summaries, interview transcripts, and coded data are available upon request.

References

- Barbier, E. B., Hacker, S. D., Kennedy, C., Koch, E. W., Stier, A. C., & Silliman, B. R. (2011). The value of estuarine and coastal ecosystem services. *Ecological Monographs*, 81(2), 169–193. <https://doi.org/10.1890/10-1510.1>
- Chesapeake Bay Program. (2022). *Living Shoreline Outreach*. <https://cbtrust.org/wp-content/uploads/Living-Shoreline-Outreach-Implementation-Plan.pdf>
- Chesapeake Bay Watershed Agreement, (2014). <https://www.chesapeakebay.net/files/Chesapeake-Bay-Watershed-Agreement-Amended.pdf>
- Clean Streams. (2025). *The intersection of vegetated tidal wetland mowing with wetland protection laws, regulations and policies in Virginia and Maryland: First steps towards estimating extent and location using temporal NDVI and machine learning*. <https://cbtrust.org/wp-content/uploads/Wetlands-Mowing-Final-to-CBT-1.27.25.pdf>
- Green Fin Studio. (2018, November). Wetlands Work. <https://www.wetlandswork.org/>
- Newburn, D., Lichtenberg, E., Wietelman, D., Kim, Y., & Wang, H. (2025, March). *Effectiveness of Economic Incentives to Enhance Riparian Buffer Adoption and Environmental Benefits for Water Quality and Carbon Sequestration* [Presentation]. 2025 AGNR Climate Adaptation and Mitigation Workshop, College Park, Maryland, USA.
- OpinionWorks. (2016). *Landowner Attitudes Towards Wetland Restoration*. <https://cbtrust.org/wp-content/uploads/FY14-Accelerate-wetland-restoration-in-support-of-WIPs-GIT-integration.pdf>
- Sudol, T. A., Miller Hesed, C. D., Clark, J. M., & Moser, F. C. (2023). Resisting-accepting-directing sea level rise on the Chesapeake Bay: Agricultural producers' motivations and actions. *Journal of Environmental Management*, 332. <https://doi.org/10.1016/j.jenvman.2023.117355>

The National Center for Smart Growth Research and Education. (2017). *Conservation Land-Use Policy Toolkit*. https://www.chesapeakebay.net/files/documents/chesapeake_land_use_policy_report_final_5-31-2017.pdf

The Nature Conservancy. (2020). *Targeted Outreach to Increase Implementation of Wetland Restoration and Protection on Delmarva* (pp. 1–14). https://cbtrust.org/wp-content/uploads/15769_TNC_Wetland-Black-Duck-CBT-Report-Aug2020.pdf

The Nature Conservancy. (2024). *SEAFARE: Supporting Equitable Access to Funding for Adaptation Resources* (pp. 1–40). https://www.nature.org/content/dam/tnc/nature/en/documents/SEAFARE_Report_TNC_Maryland_May_2024.pdf

The Nature Conservancy, & Equival Partners. (2024). *Toward a Resilient Coastline in Maryland* (pp. 1–18). https://www.nature.org/content/dam/tnc/nature/en/documents/Toward_a_Resilient_Coastline_in_Maryland_TNC_August_2024.pdf

Van Dolah, E. R., Miller Hesed, C. D., & Paolisso, M. J. (2020). Marsh Migration, Climate Change, and Coastal Resilience: Human Dimensions Considerations for a Fair Path Forward. *Wetlands*, 40, 1751–1764. <https://doi.org/10.1007/s13157-020-01388-0>

Interviews

Bellman, H. (2025, April 3). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Coleman, S. (2025, April 3). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Ehrenreich, M. (2025, April 22). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Gould, W. (2025, April 15). *Landowner Engagement Interview* [Phone Call to Taryn Sudol].

Heyn, S. (2025, April 8). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Hughes, S., & Stiff, M.C. (2025, April 14). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Lawal, H. (2025, April 3). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Murrell, P. (2025, April 14). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Peabody, R. (2025, April 3). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Prezioso, L. (2025, April 17). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].

Tully, K., & Gedan, K. (2025, April 15). *Landowner Engagement Interview* [Video Conference to Taryn Sudol].