

Advancing Outreach Effectiveness to Improve Conservation Practice Adoption



STAC Workshop Report January 26-28, 2021 Virtual Workshop



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The Scientific and Technical Advisory Committee (STAC) provides scientific and technical guidance to the Chesapeake Bay Program (CBP) on measures to restore and protect the Chesapeake Bay. Since its creation in December 1984, STAC has worked to enhance scientific communication and outreach throughout the Chesapeake Bay Watershed and beyond. STAC provides scientific and technical advice in various ways, including (1) technical reports and papers, (2) discussion groups, (3) assistance in organizing merit reviews of CBP programs and projects, (4) technical workshops, and (5) interaction between STAC members and the CBP. Through professional and academic contacts and organizational networks of its members, STAC ensures close cooperation among and between the various research institutions and management agencies represented in the watershed. For additional information about STAC, please visit the STAC website at <http://www.chesapeake.org/stac>.

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Executive Summary

Improving the adoption of conservation practices requires more than increasing awareness or expanding outreach efforts. A more strategic approach to how technical service providers (TSPs) and outreach specialists allocate limited time, resources, and attention across different engagement strategies may be needed. This report synthesizes insights from a multi-session workshop to develop a framework for understanding and improving outreach effectiveness across the adoption pathway, from awareness to willingness, implementation, and long-term persistence.

Workshop participants emphasized that adoption is not a single decision, but a staged, context-dependent process influenced by a range of interacting factors, including knowledge, beliefs, attitudes, social norms, and structural constraints. Outreach strategies are most effective when they align with the specific decision factors that limit progress at a given stage and are tailored to the local context.

The workshop also highlighted a critical gap: although practitioners can readily identify outreach activities, there is less clarity about how those activities influence underlying decision factors or how to prioritize among them. Addressing this gap may necessitate more explicit use of structured decision-making and modeling approaches to guide outreach investments under uncertainty.

Key Takeaways for Practitioners and Decision Makers

Synthesis of the discussions at the workshop, arising out of both expert presentations and practitioners' reflections, identified several central messages.

- Treat outreach as a strategic decision problem. Outreach is not simply about delivering information; it involves choosing among alternative strategies and allocating limited resources to maximize impact.
- Align strategies with stages of adoption. Different approaches are needed to move producers and land managers from awareness to willingness, then to actual adoption, and commitment to long-term implementation. A “one-size-fits-all” approach is unlikely to be effective.
- Target underlying decision factors, not just behaviors. Effective outreach works by influencing beliefs, knowledge, norms, and constraints. Identifying which factors are limiting progress is critical to selecting appropriate strategies.
- Account for context. The effectiveness of any strategy depends on local conditions, including farm characteristics, social networks, market pressures, and institutional settings.
- Recognize persistence as a distinct challenge. Long-term maintenance of practices depends on ongoing support, economic viability, and alignment of incentives over time, not just initial adoption.

- Expect and plan for uncertainty. There is significant uncertainty about which strategies work best in different contexts. This uncertainty should be explicitly acknowledged and managed.

Priority Recommendations

To improve the effectiveness of conservation outreach, the workshop committee recommends:

- Integrate structured decision making into outreach planning. Use formal frameworks to define objectives, compare alternative strategies, and evaluate expected outcomes.
- Develop and use simple models to guide decisions. Models do not need to be complex, but they should help clarify assumptions about how outreach strategies influence decision factors and adoption outcomes.
- Align data collection with decision needs. Design outreach records, surveys, and follow-up efforts to capture information about decision factors and stage transitions, not just participation metrics.
- Invest in approaches that build both knowledge and trust. Recognize that information provision and relationship-building are complementary, not competing, strategies.
- Strengthen support for persistence. Expand follow-up, technical assistance, and incentive structures that enable long-term maintenance of practices.
- Normalize the use of modeling and iterative learning. Embed modeling and evaluation into routine outreach practice to support adaptive management and continuous improvement.

Conclusion

This report advances a conceptual framework that links outreach actions, decision factors, and adoption outcomes within a structured, context-dependent process. A key finding of the workshop is that current approaches to evaluating outreach effectiveness are often insufficient to guide strategic decision making. This report highlights such limitations and identifies opportunities to improve learning and evaluation. By reframing outreach as a decision problem and emphasizing targeted strategies, feedback, and learning, the report provides a foundation for continually improving both the effectiveness and efficiency of conservation outreach.

Although this workshop was held in 2021, the insights and uncertainties captured in this report continue to shape current research and practice. The Foundation for Food & Agriculture Research, together with the Walton Family Foundation, developed the [Achieving Conservation Through Targeted Information, Outreach & Networking \(ACTION\) Program](#) directly in response to the workshop. Funded projects test how different factors influence movement along the adoption pathway, from awareness and willingness to implementation and persistence. Early

results support the workshop's central finding that no single mechanism explains conservation adoption; rather, outcomes depend on the interaction of social, behavioral, and structural factors across stages. This continued validation underscores the relevance of the framework and recommendations presented in this report.

Technical Summary

Agricultural conservation practices such as cover crops, conservation drainage, riparian buffers, and restored wetlands are central to achieving water quality and restoration goals across the Chesapeake Bay watershed and worldwide river systems. Practice effectiveness is widely regarded as well-established from a technical perspective, yet long-term adoption remains challenging (i.e., the technology adoption gap). Workshop discussions highlighted that awareness of conservation options alone may not be sufficient to support movement toward willingness, commitment, and long-term persistence. This report synthesizes insights from a January 2021 STAC workshop to explore this gap and evaluate the effectiveness of outreach in promoting conservation practice adoption, to support the Chesapeake Bay Program (CBP) and its partners in making more informed decisions about how and where to invest limited outreach capacity.

The workshop brought together farmers and land managers; certified experts who assist agricultural producers in planning, designing, and implementing conservation practices (i.e., Technical Service Providers, or TSPs); conservation district and agency staff; non-profit practitioners; funders; and researchers from across the watershed. The report is based on plenary presentations, slide decks, facilitated breakout discussions, closing panel reflections, and an interactive participant survey that was used iteratively throughout the workshop to prompt reflection, facilitate knowledge exchange, and surface ideas about outreach strategies and drivers of adoption. Findings are intended to support program learning and decision making rather than statistical inference.

The workshop had four main objectives: (1) to help outreach practitioners and TSPs better understand farmers' and landowners' concerns and decision contexts; (2) to guide more deliberate choices about where to focus outreach time and resources and which approaches to use at different stages of engagement; (3) to identify key knowledge gaps that can guide future research; and (4) to strengthen connections and spur collaboration among people who rarely have structured time together. The overarching practical goal is to support more strategic, transparent, and learn-while-doing approaches to outreach that can improve the adoption of conservation practices.

The opening discussion explored the decision contexts in which farmers and land managers operate. Participants emphasized that broad labels such as "farmer" or "landowner" can mask differences in operation size and type, tenure and succession, financial position, risk exposure, and values. They identified three interlocking elements that shape adoption decisions: (1) who is making the decision (owner-operator, tenant, non-operator landowner, family partnership, manager); (2) which practices are under consideration (e.g., annual in-field practices versus permanent structural practices at the edge-of-field or stream); and (3) which programs and practitioners are involved (districts, Natural Resources Conservation Service (NRCS) and state agency staff, Extension, nongovernmental organizations (NGOs), private advisors). These differences, together with knowledge of the local land setting, influence how conservation practices are perceived, how much flexibility decision-makers have to experiment, and how they weigh short- and long-term tradeoffs.

Across sessions, several themes emerged repeatedly. First, information relevance is critical: many decision makers already know, in general terms, that conservation practices can benefit soil and water, but lack tailored information about how a specific practice will affect their yields, timing, labor, costs, and risk under local conditions. General watershed messages are rarely sufficient. Second, trust and relationships matter greatly. Farmers and landowners are more likely to share concerns and consider change when they have ongoing relationships with people who understand their operation, communicate honestly about tradeoffs, and are likely to be present over time. Third, constraints and feasibility often form the “last mile” barrier to implementation: time and labor bottlenecks, equipment limitations, complex paperwork, permitting and engineering requirements, contractor availability, and uncertainty about maintenance and long-term obligations. Participants stressed that many farmers and land managers are willing in principle but cannot overcome these practical obstacles on their own.

The workshop also revealed multiple, overlapping “models” that the participants implicitly use to explain adoption outcomes, including: (1) a trust-first model focusing on relationships and institutional credibility; (2) an information-relevance model emphasizing tailored, operation-specific information; (3) a social norms and network model focusing on peer examples and local expectations; (4) an incentive-driven model centering on financial risk and cost-share; (5) a constraint/feasibility model emphasizing practical barriers; and (6) an identity/ethos model highlighting stewardship values, legacy, and reputation. However, participants agreed that real-world decisions rarely follow a single model; several mechanisms typically operate at once, and their relative importance varies by practice, person, and place.

To make these ideas more usable, the workshop drew on a combined behavioral and decision-science framework. On the behavioral side, discussions used a blended Theory of Planned Behavior / Diffusion of Innovations view in which background factors (personal characteristics, farm characteristics, broader context) and practice attributes (relative advantage, complexity, compatibility, trialability, observability, perceived risk) shape attitudes, social norms, and perceived behavioral control, which in turn influence intention, behavior, and persistence. On the decision side, participants considered a simple conceptual change model in which outreach and technical assistance can affect decision makers at each adoption stage—from no awareness to awareness, willingness, commitment, implementation, and persistence. Each stage is represented as a transition with an associated probability, and outreach and technical assistance are treated as means to altering those probabilities by changing how practices are perceived (e.g., reducing complexity, increasing perceived advantage, lowering risk), strengthening trust and norms, and reducing practical constraints. This combined behavioral and decision-science framework encourages programs to be explicit about which stage they are targeting, which mechanisms they aim to influence, and how specific outreach activities are expected to change the likelihood of movement along the adoption pathway.

The interactive participant survey reinforced the multi-stage, multi-mechanism picture. Respondents described distinct outreach strategies for awareness (field days, tours, broad communication), for commitment (one-on-one visits, tailored planning, incentives), and for implementation (paperwork help, permitting and contractor support, follow-up technical assistance). When asked which behavioral inputs these strategies were intended to influence, they most often named combinations of knowledge, constraints, norms, and attitudes rather than

single decision drivers. Participants noted that current program-level evaluations typically track acres and contracts but capture little information about trust, perceived feasibility, norms, identity, or longer-term persistence and de-adoption. Many expressed interest in modest, realistic improvements that would allow programs to learn more systematically from ongoing work.

Recommendations derived from the workshop activities are organized for three main audiences. For outreach practitioners and TSPs, these include being explicit about the targeted adoption stage, investing in relationship continuity, tailoring information to specific operations, addressing practical constraints as part of outreach, using peer networks intentionally, and documenting what is tried and learned. For social scientists and research institutions, recommendations call for building on the practitioner-grounded models; focusing on key uncertainties (how outreach influences and interacts with attitudes, beliefs, norms, knowledge, and constraints, especially for non-operator landowners, persistence and de-adoption, norms and networks, timing and sequencing); embedding studies in ongoing programs; and measuring more than acres and contracts. For the Chesapeake Bay Program and funders, recommendations include supporting common language and simple frameworks for describing outreach activities and adoption stages; investing in reducing the “last mile” functions (permitting, contracting, paperwork support); encouraging practitioner–researcher partnerships; piloting and comparing outreach “packages”; and incorporating behavioral insights into planning and modeling assumptions.

This report is designed to complement separate work on TSP network coordination and collaborative implementation. Whereas much previous work focuses on how to organize and support TSP systems across regions, this workshop focused on how farmers and landowners make decisions and how outreach and technical assistance can more effectively support those decisions. This report should be understood as a contribution to a long-standing and evolving body of work on conservation adoption and outreach effectiveness. Rather than introducing new concepts, the workshop sought to advance these ongoing conversations by building shared language, clarifying key uncertainties, and developing practical frameworks that can be tested and refined over time, thereby helping the Chesapeake Bay community connect theory to practice and adapt outreach strategies in support of restoring and sustaining the Bay’s lands and waters.

1.0 Introduction

Efforts to restore the lands and waters of the Chesapeake Bay watershed heavily rely on widespread adoption of agricultural conservation practices (Boesch et al. 2001). Decades of research show that practices such as nutrient management, cover crops, structural edge-of-field measures, riparian buffers, and restored wetlands greatly improve soil health and reduce nutrient and sediment loss (Moriassi et al. 2020). However, adoption remains inconsistent and often falls short of meeting watershed goals (Wade et al. 2015). Nationally, even widely promoted practices show uneven uptake: in 2010–11, only about 23% of corn/cotton/soybean/wheat acres were on farms using no-till or strip-till on every acre, and another ~33% were on farms using these practices only on some acres (Figure 1). Though rates varied substantially by region, cover crop adoption was even lower, accounting for less than 2% of total cropland (Figure 2).

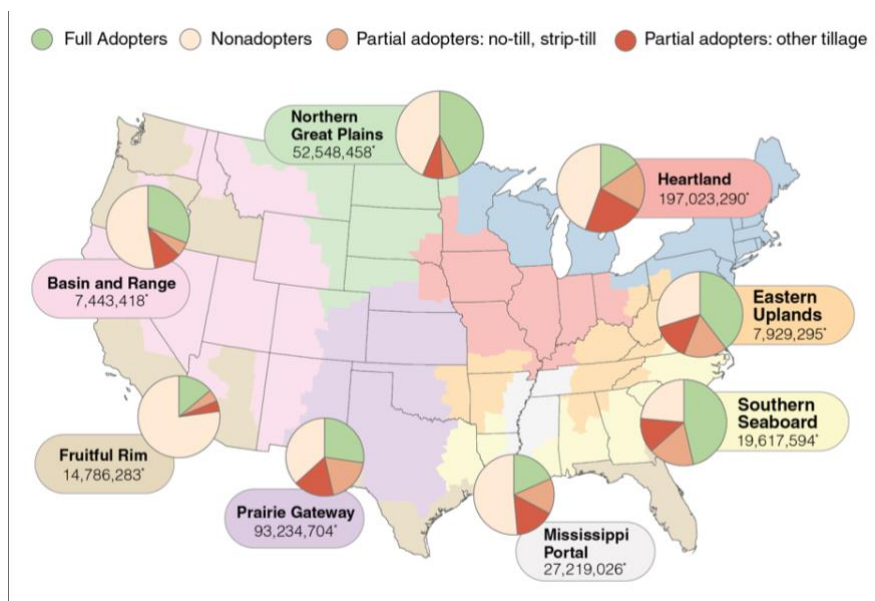


Figure 1. No-till and strip-till adoption on corn, cotton, soybean, and wheat acres by U.S. farm resource region, 2010-11. Pie charts show the share of crop acreage on farms that used no-till/strip-till on every acre (full adopters), used a mix of no-till/strip-till and other tillage on some acres (partial adopters), or did not adopt no-till/strip-till (nonadopters). Source: Wade et al. (2015), using USDA-NASS Agricultural Resource Management Survey (2010-11).

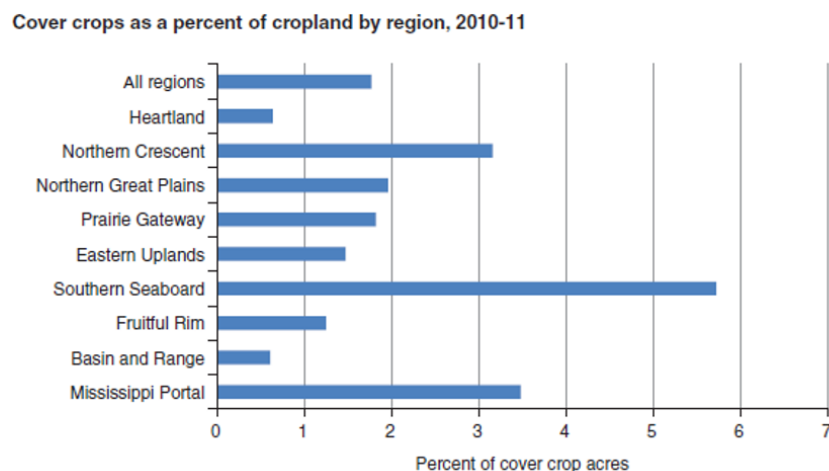


Figure 2. Cover crops as a percent of cropland by U.S. farm resource region, 2010-11. Bars show the percent of total cropland acres planted to cover crops, highlighting substantial regional variation. *Note:* Cover crop estimates are reported relative to all planted cropland acres (not limited to corn, soybean, wheat, and cotton). Source: USDA Economic Research Service (ERS) and USDA National Agricultural Statistics Service (NASS), Agricultural Resource Management Survey (ARMS), 2010-11.

Technical information, financial incentives, and program options can support conservation adoption, but they do not fully explain adoption outcomes. Behavioral research and workshop discussions point to a broader set of interacting factors, including farmer and farm characteristics, attitudes and beliefs, perceived feasibility, social norms, trust, and program context (Ajzen 1991; Rogers 2003; Reimer et al. 2012; Arbuckle and Roesch-McNally 2015). Workshop presentations and discussions further emphasized that these factors interact and operate within a broader context that includes operational constraints, community networks, market pressures, and policy and program design. Participants also explored how practitioner-grounded conceptual models could make these relationships explicit, identify uncertainties, and guide more strategic outreach efforts.

The January 2021 workshop, supported by the Chesapeake Bay Program’s Scientific and Technical Advisory Committee (STAC) and partners, was convened as an intentional step toward advancing these efforts. Rather than seeking consensus on “the right outreach strategy,” the workshop created space for practitioners, farmers, land managers, social scientists, and program leaders to share concerns, compare experiences, and surface multiple, sometimes competing, hypotheses about what drives adoption. This kind of consultative knowledge exchange supports shared understanding and helps build the buy-in needed for collective action to restore the Bay’s lands and waters. The workshop also identified significant limitations in how outreach effectiveness is currently evaluated. This issue, explored in detail later in the report, limits practitioners' ability to learn from experience and improve strategy over time.

A central theme that emerged is the need to shift from isolated tactics and implicit assumptions toward a model-based, learn-as-you-do approach to outreach. Participants described how trust, information relevance, norms, incentives, constraints, and stewardship identity each seem to

matter, and how they likely interact in complex ways across the adoption pathway. At the same time, they acknowledged significant uncertainty about which mechanisms are most important for different farmers, at various times, and under different conditions. The workshop did not resolve these questions; instead, it clarified them and highlighted a shared interest in advancing social–ecological research to test and improve models over time and guide outreach efforts.

The purpose of this report is to synthesize what was shared and learned during the workshop and to organize those insights into a workable framework for model-based outreach research and practice. In keeping with STAC workshop report conventions, all references and materials are limited to those explicitly presented or cited during the workshop itself. Drawing on plenary presentations, breakout discussions, closing reflections, and survey responses, the report: (1) describes the decision contexts and farmer priorities that shape conservation adoption; (2) summarizes relevant behavioral theory; (3) articulates several competing models of how adoption occurs; (4) highlights the interdependence among these mechanisms; (5) presents survey evidence and practitioner perspectives that support a view of adoption shaped by multiple interacting drivers; and (6) proposes a learn-while-doing research agenda for the Chesapeake Bay Program (CBP) and its partners.

The report is organized to mirror the workshop agenda:

- Section 1 introduces the workshop’s rationale and objectives.
- Section 2 presents the decision context framed for the workshop.
- Section 3 summarizes behavioral foundations of conservation adoption.
- Section 4 highlights shared ideas that emerged when participants were challenged to consider alternative approaches and models to inform outreach efforts.
- Section 5 explores interdependencies and uncertainties in our understanding.
- Section 6 highlights additional insights shared through an open survey.
- Section 7 presents post-workshop reflections.
- Section 8 presents a synthesis and summary of the workshop findings.
- Section 9 offers recommendations compiled from the workshop discussions for practitioners, researchers, and the CBP partnership.

The report concludes by emphasizing this workshop as an important step in an ongoing process of co-developing knowledge and practice to support restoration of the Bay’s lands and waters.

1.1 Workshop Overview

The virtual workshop, "Advancing Outreach Effectiveness to Improve Conservation Practice Adoption," was held in January 2021 with support from the CBP’s Scientific and Technical Advisory Committee (STAC), the Foundation for Food & Agriculture Research (FFAR), the National Fish and Wildlife Foundation (NFWF), The Nature Conservancy (TNC), and partner organizations. Over three half-day sessions, the workshop brought together a wide-ranging group of participants, including farmers and farm advisors, technical service providers, conservation

district and agency staff, university researchers, non-profit practitioners, and program managers working both within and outside the Chesapeake Bay watershed.

Throughout, the workshop was designed as an interactive process grounded in discussion and peer exchange, rather than a one-way flow of information. Plenary presentations laid the foundation, but most of the time was spent on facilitated breakout discussions, whole-group reflection, and synthesis. This structure allowed participants to share experiences across roles, crops, and regions, and to compare how different programs and communities perceive the same adoption challenges.

To support a shared baseline across participants from different roles and regions, the planning team provided a short set of working definitions for key terms used throughout the workshop (e.g., beliefs/values, attitudes, norms, behavioral intention, adoption/persistence, and categories of conservation practices and landowner types). Key decision factors referenced in this report are defined below, with additional definitions provided in Appendix C to support consistent interpretation across disciplines.

Key Definitions:

*knowledge*¹

1 : a body of facts learned by study or experience

2 : the sum of what is known : the body of truth, information, and principles acquired by humankind

any information specific to an opportunity (program, event, etc.) or practice that is necessary to create awareness⁴

*belief*¹

1 : a state or habit of mind in which trust or confidence is placed in some person or thing

2 : something that is accepted, considered to be true, or held as an opinion : something believed

a subjective probability that a given behavior will produce a certain outcome, positive or negative³

any practice or program specific "opinions" as to the relative costs and benefits of action (e.g., forming an intention to engage in a conservation program might require strongly held beliefs like trust in the government, effectiveness of the practices being promoted, etc.)⁴

*attitude*¹

1 : a position assumed for a specific purpose

2 : a mental position with regard to a fact or state

one's positive or negative view of an attitude object; often reflects beliefs²

*constraint*¹

1 : the state of being checked, restricted, or compelled to avoid or perform some action

the ability to perform a behavior³

anything in the local to national (or even international) context that makes it hard to act on one's intentions to engage in conservation⁴

*norm*¹

1 : an authoritative standard : model

2 : a principle of right action binding upon the members of a group and serving to guide, control, or regulate proper and acceptable behavior

rules developed by a group of people that govern how individuals within that group should behave³

¹Merriam-Webster Dictionary <https://www.merriam-webster.com/>

²Prokopy, L. S., K. Floress, J. G. Arbuckle, et al. 2019. Adoption of agricultural conservation practices in the United States: Evidence from 35 years of quantitative literature. *Journal of Soil and Water Conservation* 74:520-534.

³Inman, A., M. Winter, R. Wheeler, E. et al. 2018. An exploration of individual, social and material factors influencing water pollution mitigation behaviors within the farming community. *Land Use Policy* 70:16-26.

⁴workshop definition

1.2 Workshop Objectives

The workshop was designed to support the CBP and its partners in improving the effectiveness of conservation outreach and technical assistance, particularly regarding farmer and landowner adoption of agricultural conservation practices. The planning team identified four objectives:

1. *Inform outreach practitioners and technical service providers about farmers', landowners', and land managers' concerns regarding the adoption of conservation practices.* The workshop aimed to create opportunities for practitioners to hear and compare how community members view conservation practices, what they worry about, and what helps or hinders them in making changes on their operations. By sharing experiences from different programs and regions, the workshop was intended to help practitioners better align outreach and assistance with the practical realities and concerns brought to these decisions.
2. *Guide allocation of outreach effort and strategy.* A second objective was to support more deliberate choices about where to focus limited outreach time and resources, and which approaches to use in different situations. Discussions explored which types of outreach (e.g., field days, one-on-one visits, peer networks, or financial incentives) are most useful at different stages of engagement with farmers and landowners. These insights can help programs decide how to balance and target their efforts.
3. *Identify key knowledge gaps to guide research partnerships in advancing the adoption of conservation practices.* The workshop also sought to clarify what is not yet well understood about adoption, such as how best to work with non-operator landowners, how social networks shape decisions, or what factors influence long-term maintenance of practices. Identifying these gaps can help public agencies, conservation organizations, and funders coordinate future funding and research initiatives that address the most critical uncertainties.
4. *Spark new relationships, ideas, and collaborations.* Finally, the workshop was intended to connect people who rarely have structured time together: farmers and farm advisors, local conservation staff, non-profit partners, researchers, and program managers. By hearing one another's perspectives and comparing outreach experiences, participants began building relationships and ideas that can be carried forward into ongoing work in the Chesapeake Bay watershed and beyond.

Taken together, these objectives reflect a practical goal: to help those working on agricultural conservation outreach better understand the concerns and circumstances of the people they serve, make more informed choices about how and where to focus their efforts, and coordinate future learning and partnership efforts in support of the Bay's restoration goals.

1.3 Consultation as a First Step Toward Consensus and Consent

A cross-cutting intention of the workshop was to serve as an exemplar consultation within the broader Chesapeake Bay restoration effort. Participants were encouraged to name tensions,

uncertainties, and failures alongside successes, and to recognize the expertise that farmers, practitioners, and researchers each bring to addressing conservation challenges. This emphasis on mutual learning is essential for building the kind of community consensus needed to align programs and expectations and, ultimately, for securing the community consent required for widespread, durable adoption of conservation practices.

The sessions summarized in the remainder of this report should therefore be understood not as definitive answers, but as an initial, structured community exploration of how outreach can better support farmers and land managers in making conservation decisions that work for their operations, their communities, and the Bay.

2.0 Understanding Stakeholder Priorities & Decisions

The opening workshop session focused on defining the decision context – whose decisions are we trying to inform, and under what conditions? Presentations and discussion highlighted that conservation decisions are shaped by who the farmer or land manager is, the type of operation, the available practices, and the outreach professionals and programs involved. Participants emphasized that these decisions rarely hinge on a single factor; instead, they reflect a combination of practical, economic, social, and personal considerations that vary across people and places. Figure 3 illustrates how watershed-scale priorities translate to farm-scale decisions, where feasibility and tradeoffs are evaluated in a specific operational context.

To help organize participant input about conservation adoption in support of shared conservation and restoration goals, the workshop organizers proposed a simple decision framework:

- Decision Makers: landowner–operators, tenants, non-operator landowners, and family.
- Practice Options: annual in-field practices such as cover crops; structural edge-of-field or edge-of-stream practices such as wetlands, buffers, and drainage modifications.
- Outreach Agents: Natural Resources Conservation Service (NRCS) and conservation district staff, Extension, non-profit partners, private crop advisors, and other technical service providers.

Participants used this framework in breakout discussions to reflect on challenges in their own work and where they see the greatest need for new approaches. At the same time, they cautioned that adoption challenges and opportunities differ depending on who is making the decision, the kind of change being sought, and which institutions are offering assistance. For example, decisions about annual practices that fit within existing equipment and crop rotations may look very different from decisions about a permanent structural practice that changes how land can be used in the future.

Session I and the opening breakouts focused on defining the decision context and documenting participants' perspectives on (1) farmer concerns and priorities that are not well understood, (2) key challenges and opportunities related to adoption, (3) commonly cited issues that may be less influential in practice ("non-concerns"), and (4) takeaways to carry forward.

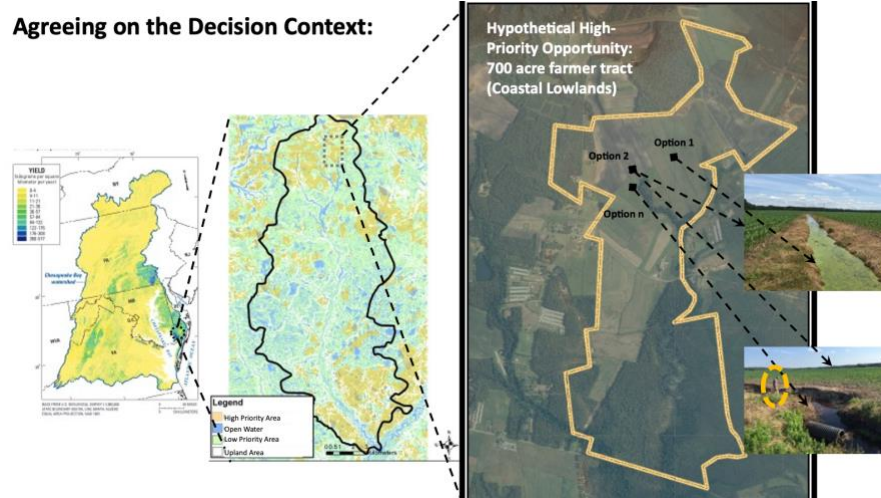


Figure 3. Example from the opening session on decision framing, linking watershed prioritization to farm-scale conservation options. The figure illustrates how priority areas identified at the watershed or sub-watershed scale can be used to focus attention on a particular farm tract, where multiple conservation practices may be considered. This example highlights how site conditions and operational realities shape what is feasible and relevant for outreach.

2.1 Decision Maker Characteristics and Operational Context

Breakout groups underscored that broad labels such as “farmer” or “landowner” can obscure the wide range of circumstances, values, and priorities that shape agricultural decision making. Within categories like owner–operator, tenant, non-operator landowner, or land manager, there are important differences in:

- Farm or tract size, production systems, and markets.
- Tenure and succession (e.g., multigenerational family operations, newer entrants, part-time farmers).
- Financial position, risk exposure, and access to credit.
- Values, goals, and the degree to which conservation is already part of their identity.

Participants noted that these differences influence how people think about conservation practices, how much flexibility they have to experiment, how quickly they can respond to new opportunities, and how they weigh tradeoffs. For example, a smaller operation with limited labor may face very different constraints than a larger operation with more equipment and staff, even if both are interested in the same practice. These differences matter because outreach strategies that work well for one group may not be as effective for another. It also highlights the need to better understand whom programs are reaching and whom they may be leaving out.

2.2 Information Relevance and Perceived Risk

A recurring theme in the opening session was the importance of information to a specific operation. Participants noted that many farmers and landowners generally know that conservation practices can enhance soil health and water quality. What they often lack is practical, tailored information about:

- How a given practice will fit into their existing rotation and equipment.
- Expected yield and profitability impacts under local conditions.
- Up-front and ongoing costs, and how cost-share programs actually work in practice.
- How variable outcomes are likely to be over time and across fields.

Without this level of detail, many decision makers see conservation practices as risky. They may worry about yield losses, extra labor, timing conflicts, or hidden costs. Participants noted that generic watershed-scale messages or broad statements about environmental benefits rarely change minds on their own. On the other hand, when outreach providers can discuss practice performance, costs, and logistics in ways that directly relate to the farmer's operation, farmers are more open to trying something new. These insights show that how information is framed and tailored can greatly influence perceived risk and willingness to act.

2.3 Trust and Relationships

The opening discussions also highlighted trust as a central factor in conservation decisions. Participants described trust in several ways:

- Trust in the *person* delivering information (local conservation staff, crop advisors, neighbors, NGO staff, agency representatives).
- Trust in the *institution* behind the program (NRCS, conservation districts, state agencies, non-profits).
- Trust in the *fairness and stability* of program rules and funding.

Many practitioners noted that farmers are more likely to ask questions and consider new practices when they have ongoing relationships with people they believe understand their operation and will be there over time. Frequent staff turnover, inconsistent program availability, or experiences where expectations were not met can undermine trust and make farmers reluctant to engage again.

Participants also observed that trust and information are linked. The same information can be received very differently depending on who delivers it and whether the farmer believes that person is knowledgeable, listens well, and has their interests at heart. This reinforces the importance of long-term, relationship-based outreach, especially for practices that require substantial change.

2.4 Constraints, Feasibility, and “Last Mile” Barriers

Even when farmers and landowners are positively disposed toward conservation, they may still face significant barriers to implementation. Practical constraints included:

- Limited time during critical planting and harvest windows.
- Competing demands on labor and equipment.
- Complexity of program rules and paperwork.
- Permitting and engineering requirements for structural practices.
- Difficulty finding and coordinating reliable contractors.
- Uncertainty about maintenance responsibilities and long-term obligations.

Participants often described these combined challenges as the “last mile” problem in conservation: farmers may be interested in a practice and even enroll in a program, but struggle to see it through to implementation or long-term maintenance due to daily constraints. These observations suggest that outreach and technical support could focus not only on generating interest but also on reducing implementation barriers by simplifying paperwork, offering hands-on support, coordinating contractors, and setting realistic expectations for ongoing maintenance.

2.5 Implications for Outreach and Future Analysis

Taken together, the opening discussions reinforce that conservation adoption is shaped by who the farmer or landowner is, how a practice fits within their operation, the relationships and programs involved, and the practical constraints they face. No single factor, whether information, incentives, or attitudes, fully explains outcomes on its own.

For outreach programs, this means there is value in being explicit about which decision contexts they are working in and which types of farmers, landowners, and practices they are best positioned to serve. It also points to opportunities to more systematically describe and compare decision contexts across projects and regions, so that patterns can be better understood over time.

3.0 Behavioral Foundations for Conservation Adoption

The second session focused on what behavioral research reveals about how people decide on conservation practices. Understanding why farmers and land managers adopt, postpone, or discontinue conservation practices requires more than a list of barriers and motivations.

3.1 Behavioral Theories Relevant to Conservation Adoption

Over the past several decades, social scientists have developed numerous formal theories to explain how people form intentions and translate them into action. Many of these theories share common elements, and several have been tailored specifically to agricultural and natural resource decisions. For this workshop, the session focused on a blended framework that combines two widely used approaches: the Theory of Planned Behavior (Ajzen 1991) and the Diffusion of Innovations (Rogers 1962, 2003). This combined model offers a structured way to understand how background conditions, perceptions of specific practices, and key behavioral constructs influence intentions, behavior, and long-term persistence (Figure 4).

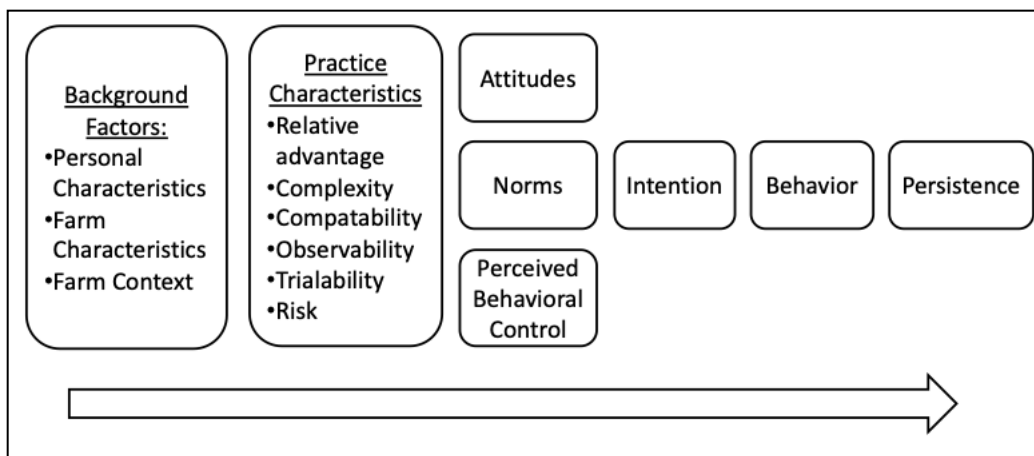


Figure 4. Conceptual framework for conservation practice adoption and persistence (merged Theory of Planned Behavior and Diffusion of Innovations). Background factors and practice characteristics shape attitudes, norms, and perceived behavioral control, which influence intention, behavior (adoption), and persistence over time. The arrow represents the causal and temporal direction of behavior. *Source:* Linda S. Prokopy, Purdue University, workshop presentation, January 26, 2021. Based on: Arbuckle and Roesch-McNally (2015); Fishbein and Ajzen (2010); Reimer et al. (2012); Rogers (2003).

On the left side of the framework are the background factors, including personal characteristics, farm characteristics, and farm context. Personal characteristics such as age and education are frequently associated with adoption decisions, with older age often linked to lower adoption and higher levels of education linked to higher adoption. Deeply held beliefs and ways of thinking, such as a stewardship ethic or systems thinking, also fall into this category. Farm characteristics matter as well: larger farms are more likely to adopt many conservation practices, and adoption tends to be higher on farms where land is more vulnerable to erosion or other visible resource concerns. Farm context adds another layer, including whether the farm is in a watershed with

active conservation programs, the state of commodity prices, and recent experiences with extreme weather or changing climate. Together, these background factors shape how a decision maker understands a practice at a particular point in time.

The second box in the framework captures the characteristics of practice. Adoption varies by practice and by how that practice is perceived. Key attributes include relative advantage compared to current practices, complexity, compatibility with existing systems, observability, trialability, and perceived risk. There are clear interactions between background factors and perceptions of practice. For example, a producer with a larger operation may view a practice as more “trialable” because there is more land available to experiment. Perceptions also differ between practices managed within the annual cropping cycle (such as cover crops) and longer-lived edge-of-field or edge-of-stream structural practices (such as wetlands or buffers), which often carry different time horizons, risks, and constraints.

Background factors and practice characteristics influence three main behavioral constructs related to a specific practice: attitudes, social norms, and perceived behavioral control. Attitudes show how positively or negatively the farmer views the practice overall. Norms represent perceived expectations in the farmer’s community—whether others are already using the practice and whether peers, family, or advisers think the farmer should do so. Perceived behavioral control indicates whether the farmer believes they can realistically implement the practice: Do they have the necessary funds, technical expertise, and equipment? Are there structural or institutional barriers, such as complicated permitting requirements or challenges related to renting land and not being the ultimate decision maker?

On the right side of the framework, these constructs influence intention, behavior, and ultimately long-term commitment, or persistence of adoption (Figure 4). Before adopting a conservation practice, a farmer must first intend to do so. Intention is an important precursor to behavior, but intention does not always result in action (Fishbein and Ajzen 2010; Ajzen 1991). In some cases, competing priorities or other constraints may intervene. In others, perceived behavioral control may not match actual control (Fishbein and Ajzen 2010; Ajzen 1991). For example, a farmer may intend to adopt cover crops but then encounter unforeseen issues with seed selection, seed availability, or timely planting, leaving the intention unfulfilled.

Within this framework, financial assistance, a key aspect for many programs, does not stand alone but affects multiple factors simultaneously. Cost-share and other incentives can boost positive attitudes toward a practice and enhance perceived behavioral control by lowering financial risk. However, both the model and the workshop experience indicate that financial aid is often necessary but not sufficient: without practical logistics, trustworthy information, or social support, incentives alone may not lead to adoption or sustained commitment.

Finally, the framework emphasizes that adoption is not always a one-time event. This is especially true for operational practices, such as cover crops, that require repeated decisions year after year. While much of the existing research focuses on initial adoption, far less is known about what drives continued use or, conversely, discontinuation after a trial or contract period ends. The persistence box on the far right of the figure is therefore both a reminder of the importance of long-term behavior and an explicit acknowledgment of a major knowledge gap.

The above merged Theory of Planned Behavior–Diffusion of Innovations framework provides a structured way to think about how background factors, practice attributes, and key behavioral constructs shape intention, behavior, and persistence. It does not explain every case, but it offers a common language for practitioners and researchers to use when interpreting adoption patterns and considering where outreach and program design might be most effective. These theories do not replace practical experience but offer a shared structure for interpreting why some messages and programs gain traction while others stall.

3.2 Participant Reflections

Attitudes, Beliefs, and Perceived Behavioral Control - Many participants recognized these elements of the blended model in their own work. They noted that farmers’ attitudes toward conservation practices are informed by:

- Direct experience in their own fields.
- Observations of neighboring farms.
- Information from agronomists, conservation staff, and suppliers of seed, fertilizer, pesticides, and other farm inputs.
- Market conditions, policy signals, and personal values.

Even when attitudes are positive, however, farmers may still feel they cannot move forward. Perceived behavioral control (how feasible something feels) often becomes the deciding factor. Common concerns include:

- “Can I get this done in the small windows between planting and harvest?”
- “Do I have the right equipment or need to invest in new machinery?”
- “Will I have enough help to manage this change?”

Workshop discussions underscored that feasibility concerns frequently outweigh general support for conservation. Practitioners observed that many farmers say they like the *idea* of a practice but do not see a clear path to fitting it into their operation. This aligns with behavioral theory’s emphasis on perceived control as a key component of intention and behavior.

Social Norms and Network Influence - Participants shared examples of how decisions are influenced by:

- What neighboring farmers are doing or are seen to be doing.
- The opinions of trusted local leaders (e.g., respected producers, lender board members, religious or community leaders).
- Family expectations and multi-generational traditions.

In some communities, conservation practices have become part of the local “story” of what good farming looks like. In others, they are still seen as unusual or risky. Participants observed that these norms can either generate momentum or make it difficult for early adopters to stand out.

Several people also pointed out that outreach programs often rely on the idea of peer influence without fully understanding how local networks are structured, for example, who interacts with whom and whose opinions hold the most sway. This gap limits the ability to intentionally support farmer leaders or develop peer-to-peer efforts that go beyond groups already engaged.

Relevance and Credibility of Information - Another theme that emerged from this session was that *what* is communicated and *who* communicates it matter just as much as *how much* is communicated. Participants noted that:

- Farmers often receive a large volume of information but may find much of it too general or disconnected from their own fields and financial situation.
- Information is more likely to be acted on when it is farm-specific, addressing questions such as:
 - “What will this practice do to my yields over the next few years?”
 - “How will it affect my planting and harvest timing?”
 - “What are the true out-of-pocket costs and cash-flow implications?”
- The same message is interpreted differently depending on whether it comes from a trusted local adviser, a long-standing conservation staff person, a neighbor, or an unfamiliar institution.

These observations closely align with the behavioral concepts of beliefs and attitudes (what people think will happen), perceived behavioral control (what they feel able to do), and norms (what they think others expect). They also reinforce the importance of credibility: farmers are more likely to trust information when it comes from sources they perceive as knowledgeable, respectful, and attuned to their operation. The session prompts did not ask participants to adopt any one theory as a complete explanation for conservation adoption. Instead, it showed how behavioral concepts can help organize the many reasons farmers give for their decisions and can support more intentional outreach design.

From the discussion, several practical implications emerged:

- *Attitudes are important, but not enough on their own.* Many farmers already see conservation as a good thing. The challenge is often helping them see how a specific practice can work within their constraints.
- *Perceived feasibility is central to adoption.* Outreach that reduces complexity, clarifies steps, and offers hands-on support can have as much impact as outreach that focuses on benefits.
- *Norms and networks can be powerful allies or barriers.* Understanding local relationships can help programs work with farmer leaders and peer groups more effectively.
- *Relevance and credibility of information are key.* Tailored, farm-specific information delivered by trusted sources is more likely to shift beliefs and intentions than general messages or one-size-fits-all materials.

These insights set the stage for the following discussions, where participants began to articulate more explicitly the different ideas (i.e., models or hypotheses) they use—often implicitly—to explain how farmers move from awareness to adoption. The behavioral foundations reviewed in

Session II provide useful building blocks for those models and for future work to better understand and support conservation decisions across the Chesapeake Bay watershed.

4.0 Exploring Alternative Outreach Models

Following the overview of behavioral foundations, the workshop shifted from describing farmer behavior to asking a practical question: *where, when, and how can outreach influence conservation decisions?* Concepts from decision science and structured decision making were introduced and used to link behavioral models to the everyday choices that technical service providers (TSPs) and program managers must make regarding how to invest limited outreach capacity. Structured decision making provides a stepwise approach for moving from problem framing and objectives to developing alternatives, evaluating consequences, selecting a preferred approach, and implementing action (Figure 5). Participants used this framing to compare outreach strategies more explicitly, for example, when time and resources are limited and programs aim to maximize conservation outcomes.

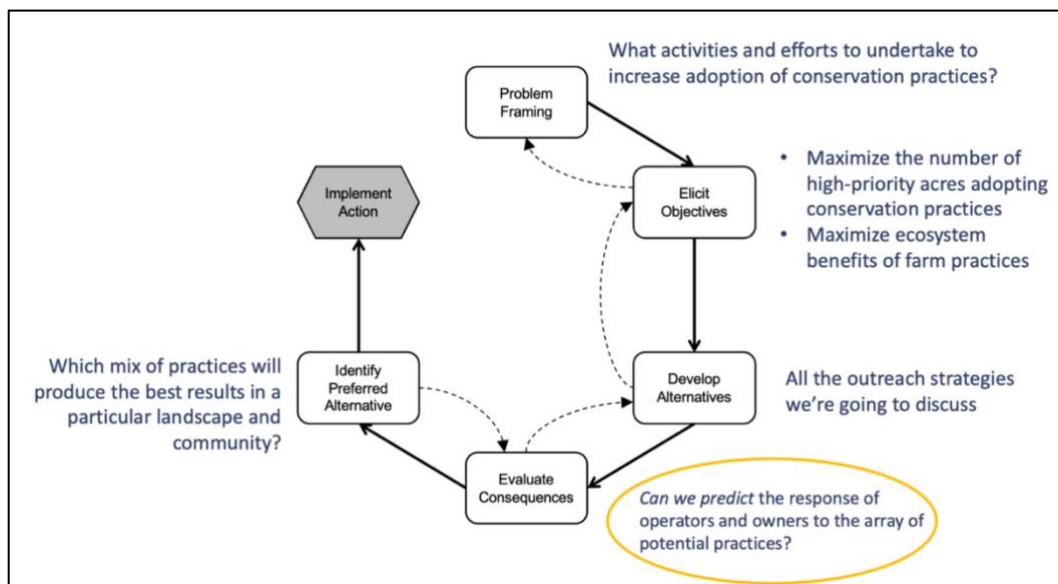


Figure 5. Structured decision-making framework adapted to conservation outreach strategy selection, to guide effort and funding among alternative outreach strategies. In this adaptation, outreach strategies are the alternatives under consideration, and the central challenge is to evaluate which strategy mix is most likely to increase adoption of conservation practices and associated ecosystem benefits in a particular landscape or community. Source: Runge et al. (2013).

4.1 From Behavioral Theory to Decision Science

There are two branches of decision science (Gregory et al. 2012):

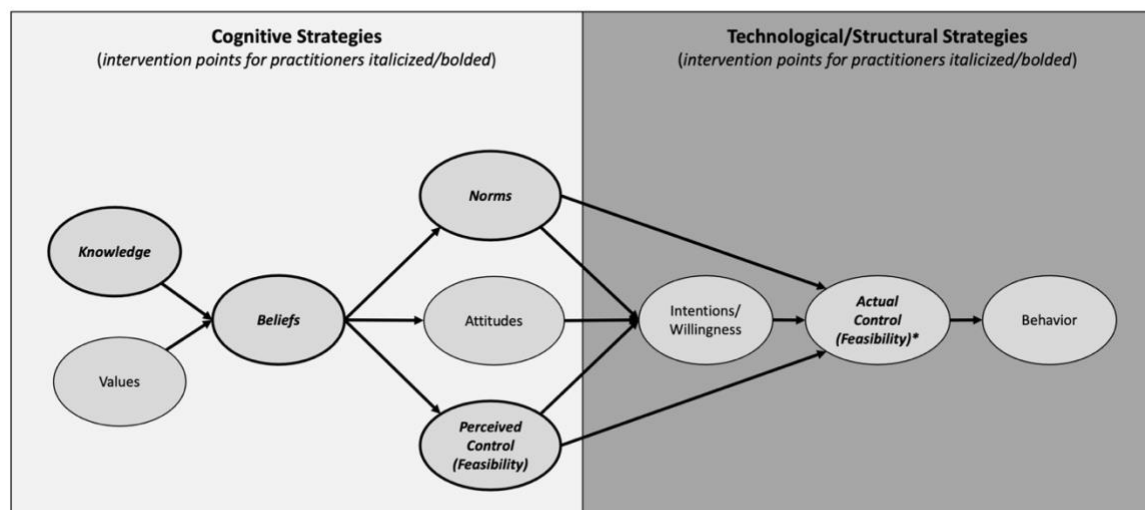
- Descriptive Decision Theory studies how people make decisions in the real world, including the kinds of biases and heuristics discussed in behavioral economics; and
- Normative Decision Theory asks how people could make decisions more systematically, accounting for risk, multiple objectives, time delays, and trade-offs.

Participants observed that much of the social science summarized earlier in the workshop, including the blended Theory of Planned Behavior and Diffusion of Innovations framework, leans toward the descriptive side: helping explain how attitudes, norms, perceived control, and other factors relate to adoption outcomes. However, outreach practitioners and program managers also need a more prescriptive perspective to help them decide which outreach activities to prioritize, especially when staff time and funding are limited. Framing outreach decisions as choices can make trade-offs clear. Addressing these questions requires the ability to predict consequences, which in turn means using some form of modeling.

4.2 Modeling as Trade-off Evaluation – Beyond Simulation

“Modeling” in this context does not necessarily mean complex computer simulations. At its core, modeling is about making explicit how one believes the system works so that the consequences of different choices can be compared. Conceptual diagrams, influence diagrams, and simple probability chains are all forms of models. Two frameworks referenced earlier in the workshop provide examples:

- The merged Theory of Planned Behavior and Diffusion of Innovations model (Section 3.1) shows how background factors and practice attributes influence attitudes, norms, perceived behavioral control, intentions, behavior, and persistence.
- The behavior change model, Figure 6 below, similarly traces pathways from knowledge, values, and beliefs through intentions and behavior, and identifies cognitive and structural intervention points, as bolded/italicized nodes.



Source: Robyn S. Wilson, The Ohio State University

Figure 6. Behavior change pathway highlighting practitioner intervention points (cognitive vs. technological/structural strategies). *Source:* Dr. Robyn S. Wilson, Ohio State University, written communication, October 26, 2020.

These models are useful for understanding the “states” of farmers and landowners, for example, how they think and feel about conservation practices, but they do not, on their own, provide much insight into how specific outreach actions can influence people to move between states along the adoption pathway.

4.3 A Change Model Focused on Outreach Leverage Points

To address this gap, the steering committee introduced a conceptual change model to facilitate discussion of a decision framework for prioritizing TSP resource allocations and identifying critical knowledge gaps (Figure 7). The model follows the familiar sequence of adoption stages but explicitly highlights when and how outreach can influence a land manager’s likelihood of adopting conservation practices. The type of TSP intervention (e.g., the actions labelled TSP 1-6 in Figure 7) would depend on the pathway stage and the decision factors (i.e., beliefs, norms, attitudes, knowledge, and constraints) believed to most heavily influence the transition from one stage to the next.

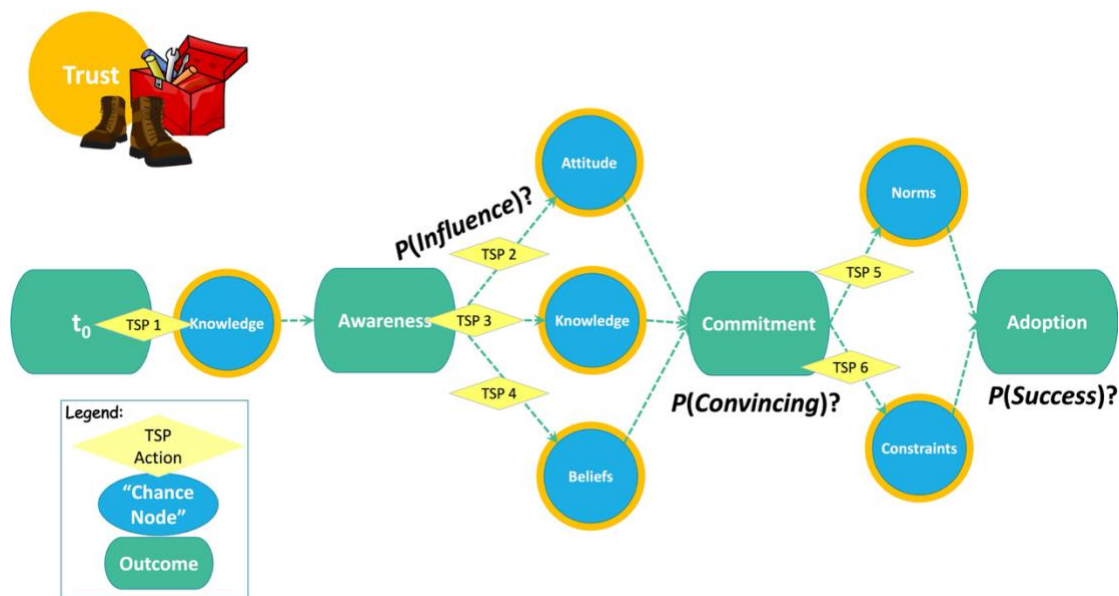


Figure 7. An early conceptual change model linking outreach intervention points to increase the adoption of conservation practices. The model highlights when and how outreach and technical assistance could influence the probability of shifting a land manager or producer along the awareness–commitment–implementation/adoption pathway. The numbered TSP actions (TSP 1, TSP 2, etc.) are generic placeholders for whatever outreach strategies are designed to facilitate the specific transitions in the model.

In summary, the model:

- Centers on a timeline starting from an initial time (t_0), in which some farmers and land managers are aware of a practice, and others are not. Key transitions include:
 - from no awareness → awareness.
 - from awareness → willingness/commitment.
 - from commitment → successful implementation.

The steering committee also recognized that the model should be extended to include an additional stage: from initial implementation to persistence of implementation.

- Associates each transition with a probability (e.g., the likelihood of “convincing,” the probability of “influence,” the probability of “success”).
- Highlights when and how TSP actions could change those probabilities, for example:
 - A TSP 1 action might consist of organizing peer-to-peer learning sessions to strengthen community networks, thereby building trust and credibility.
 - A TSP 3 action might focus on providing site-specific consultation to clarify or evaluate perceived risks and advantages of a practice.
 - A TSP 6 action might include coordinating permitting paperwork and contractors to address logistical and labor constraints.

The model suggests that the most effective outreach strategies (e.g., TSP 1, 2, 3, etc.) depend on the pathway stage and the key decision factors that influence the transition from one stage to the next in the adoption process.

4.4 Workshop Engagement with the Conceptual Adoption Framework

The follow-up discussion asked participants to grapple with this conceptual adoption framework. In breakout groups and plenary discussions, they were encouraged to:

- Examine the model’s components and transitions.
- Consider whether the stages and probabilities reflected their own experience.
- Suggest modifications or alternatives.
- Reflect on how their current outreach activities might be mapped onto the framework.

This exercise served two main purposes. First, it assessed whether the framework resonated with practitioners working directly in the field. Second, it offered an opportunity to explore outreach allocation through models, viewing it as a series of choices that influence specific parts of the decision-making process rather than as a generic set of activities. Through presentations and breakout discussions, participants identified recurring patterns in how outreach affects elements of the decision process, thereby highlighting potential pathways of influence.

Six key pathways emerged: trust, information, social norms, incentives, constraints/feasibility, and personal identity. Although these are presented here as separate conceptual models to guide outreach, the workshop discussions ultimately prompted reflection on the interconnectedness of these ideas as parts of a broader systems model.

In the **Trust-First Model**, farmers and landowners make conservation decisions primarily through relationships. Trust in the person and institution offering information and assistance is viewed as a primary driver of willingness and commitment. Participants described how:

- Farmers are more likely to take a meeting, ask difficult questions, and admit uncertainties when they have a long-standing relationship with a conservation professional or adviser.
- Frequent staff turnover, changing program rules, or inconsistent follow-through can undermine trust and make it harder to re-engage farmers, even when incentives or technical options are appealing.
- Some farmers give more weight to information from neighbors, crop advisors, or retailers than from agencies, depending on past experience.
- Outreach **strategies that build and maintain relationships**, such as regular farm visits, accessibility during key decision-making periods, and dependable follow-up, were described as the most valuable investments. Other tools (e.g., field days, brochures, websites, and financial incentives) are useful once trust has been established.

The **Information Relevance Model** starts from the observation that farmers and landowners often say, “Show me how this works on *my* farm.” In this model, adoption hinges on whether a decision maker has access to clear, credible, and operation-specific information about the likely effects of a practice. Participants emphasized that:

- Most farmers already understand, in general terms, that conservation practices can improve soil or water outcomes.
- What they need to see are practical details: likely yield effects, input cost changes, timing implications, and how the practice will interact with their soils and cropping systems.
- When information remains general or abstract, practices are perceived as risky; when it is tailored to their fields and business, the perceived risk decreases.
- Outreach strategies that provide **farm-specific diagnostics**, such as site visits, customized plans, demonstrations on similar operations, and clear explanations of program rules and costs, are central to adoption under this model. The underlying assumption is that better, more relevant information leads to more confident decision making.

The **Social Norms and Network Activation Model** highlights the influence of peers and community expectations. In this view, farmers and landowners are more likely to adopt when they see people they respect trying a practice and when that practice becomes part of what “good farming” looks like locally. Workshop participants described how:

- Adoption can accelerate in communities once one or two well-known producers adopt a practice and talk about their experience.
- In some places, there is a strong culture of conservation stewardship; in others, practices associated with outsiders or regulation can face skepticism.
- Family expectations and multigenerational norms can influence whether younger farmers feel free to try something different.
- Outreach strategies associated with this model include farmer-led field days, peer mentoring, local producer panels, and recognition programs. These efforts are not just about sharing information; they are about **shifting what feels normal and acceptable within a community**.

The **Incentive-Driven Model** focuses on the role of financial support and economic risk. In this model, farmers and landowners adopt when programs reduce the immediate cost and perceived financial risk of trying a new practice. Participants noted that:

- For higher-cost structural practices, such as wetlands, buffers, or drainage modifications, substantial financial assistance is often essential to gaining interest.
- Incentives can enable farmers to experiment without bearing all the up-front risk.
- However, incentives alone rarely ensure long-term maintenance; if practices are hard to manage or disrupt operations, they may be stopped after contracts end.
- Outreach strategies that fit this model include designing attractive cost-share packages, “stacking” incentives where appropriate, and clearly communicating the financial terms and obligations. The underlying assumption is that **lowering financial barriers** is often necessary to move from commitment to initial implementation.

The **Constraint / Feasibility Model** starts from the observation that many farmers express interest in conservation but still do not implement practices. Here, the central idea is that **practical constraints**, rather than lack of motivation or knowledge, are the main bottleneck. Participants noted:

- Common constraints:
 - Limited time during planting and harvest windows.
 - Competing demands on labor and equipment.
 - Complexity and time demand of program paperwork.
 - Permitting, engineering, and contractor challenges for structural practices.
 - Concerns about long-term maintenance responsibilities.
- Effective outreach and program strategies focus on **reducing obstacles** by streamlining forms, offering “paperwork assistance,” coordinating permits and design, arranging contractors, and setting realistic expectations for maintenance. Adoption is more likely when these challenges are actively addressed, even among farmers inclined to participate.

The **Identity / Ethos Model** emphasizes the role of personal and family values. Some farmers and landowners adopt conservation practices because they see themselves as stewards, want to leave land in better condition for future generations, or care about how they and their operations are viewed in the community. They are willing to adopt new practices with limited financial incentives because they see conservation as part of “doing the right thing” and have pride in being recognized as leaders in soil health or water protection. Outreach strategies aligned with this model include storytelling, highlighting local stewardship examples, and recognizing conservation leaders. The underlying idea is that **connecting conservation practices to identity and long-term legacy** can motivate action even when short-term logistics are challenging.

Participants emphasized that, in practice, more than one mechanism is usually at work simultaneously. For example, a farmer may decide to:

- Take a call because of a trusted relationship (Trust-First Model),
- Participate after seeing locally relevant research (Information Relevance Model),
- Draw confidence from seeing peers adopt (Social Norms Model),
- Rely on cost-share to manage up-front risk (Incentive-Driven Model),
- Require paperwork and permitting support to get to installation (Constraint / Feasibility Model), and
- Frame the decision in terms of stewardship or legacy (Identity / Ethos Model).

5.0 Interdependencies and Complexities

A key conclusion was that the six action “models” discussed in Session III should not be viewed as competing in a winner-take-all manner. Instead, they represent different parts of an interconnected system with many interactions. Shared examples included situations where strong trust could not overcome permitting delays, generous incentives did not lead to persistence, or relevant information only took hold once peer support and identity were engaged. These examples also showed that no single mechanism is sufficient on its own, and that the sequence and combination of outreach strategies are important.

- Trust shapes how information is received and whether incentives are seen as credible.
- Information relevance influences attitudes and perceived feasibility.
- Social norms shape what is considered acceptable, even when incentives are strong.
- Constraints can block adoption despite positive attitudes and strong relationships.

One of the clearest interdependencies discussed was between trust and information. Practitioners explained how relevant, honest information shared over time can build trust, especially when outreach staff acknowledge uncertainties and follow through on commitments. Conversely, information perceived as irrelevant, exaggerated, or disconnected from a farmer’s reality can erode trust, even when relationships had previously been positive. Trust also influences whether a farmer is willing to listen at all, ask detailed questions, or share concerns that need addressing. This suggests that trust and information cannot be separated neatly. Outreach strategies that focus solely on delivering more information—without attention to who delivers it, how it is framed, and whether it responds to farmers’ actual questions—may have limited impact. Likewise, relationship-building efforts that lack solid, operation-specific information may stall when farmers need concrete details to move forward.

Participants observed similar interactions between constraints and incentives. Financial incentives can make adoption more appealing, but do not automatically eliminate practical barriers such as limited time, complex paperwork, or a lack of contractors. When constraints are significant, even generous incentives may not motivate adoption. Conversely, when programs offer strong support to reduce constraints—such as help with forms, permitting, design, and coordination—more modest incentives can sometimes be more effective. Several practitioners highlighted that farmers often weigh the “transaction costs” of participating in a program alongside the formal cost-share rate. If it takes too much time to navigate the process, or if long-term obligations are uncertain, farmers may judge participation is not worth it, regardless of payment levels. These observations reinforce the idea that incentives could be considered alongside the effort required to participate and the support available to reduce it.

Another set of interactions discussed involved social norms, identity, and community dynamics. Participants shared examples of situations in which those with strong stewardship were also receptive to conservation information, especially when outreach acknowledged their existing efforts and values. Peer recognition and community pride reinforced adoption decisions, making it easier for others to follow. In some communities, skepticism toward outside institutions meant that conservation messages were more effective when delivered by local leaders.

These shared examples suggest that norms and identity can either amplify or diminish the effects of information, incentives, and trust. For instance, when conservation practices align with local norms and identity, smaller incentives and less intensive outreach may be sufficient. Where norms are more resistant, even well-designed programs may struggle unless they also support local champions and acknowledge community history and concerns.

Participants also highlighted uncertainties related to when different outreach strategies and mechanisms are most important along the adoption pathway. Questions included:

- At what point should outreach focus primarily on relationship-building versus providing detailed technical information?
- When are peer examples most influential—early in the awareness stage, or later when farmers are weighing a specific decision?
- How early should incentive discussions enter the conversation, and how do they interact with trust and norms over time?
- What kinds of support are most critical between commitment (e.g., signing a contract) and implementation?

Many practitioners described situations in which efforts appeared to be “out of sequence,” for example, providing detailed program rules before trust was established or offering incentives before farmers had seen local examples. Others noted that adoption timelines varied widely; some farmers took years to move from interest to action, whereas others moved quickly once a particular concern or opportunity arose. These uncertainties point to the importance of not only which strategies are used, but also when and in what order, and how they are adapted over time.

5.1 A Social–Ecological Systems View of Adoption

To help make sense of these interactions, Session IV provided an opportunity to revisit the adoption pathway change model introduced at the start of the workshop. Participants agreed that the initial conceptual model could serve as a useful map for examining where current outreach investments are concentrated and where gaps or missed opportunities may exist. At the same time, they emphasized that farmers and landowners make decisions within a broader social–ecological system shaped by relationships, institutions, markets, and physical landscapes that is more complex than the linear model suggests.

In this system, feedback is inherent rather than exceptional. Outreach programs, technical assistance, and incentives are not external interventions but components of the system itself. Environmental outcomes (e.g., water quality, habitat, soil health) depend not only on the practices adopted, but also on how the social system evolves: who participates, how trust changes, and whether practices are maintained over time. The revised model highlights these dynamics by emphasizing interactions and feedback loops along the adoption pathway (Figure 8). For example, successful implementation and persistence can reinforce norms and build trust, increasing community willingness to adopt conservation practices, whereas negative experiences can reinforce constraints or knowledge gaps and make future outreach more difficult.

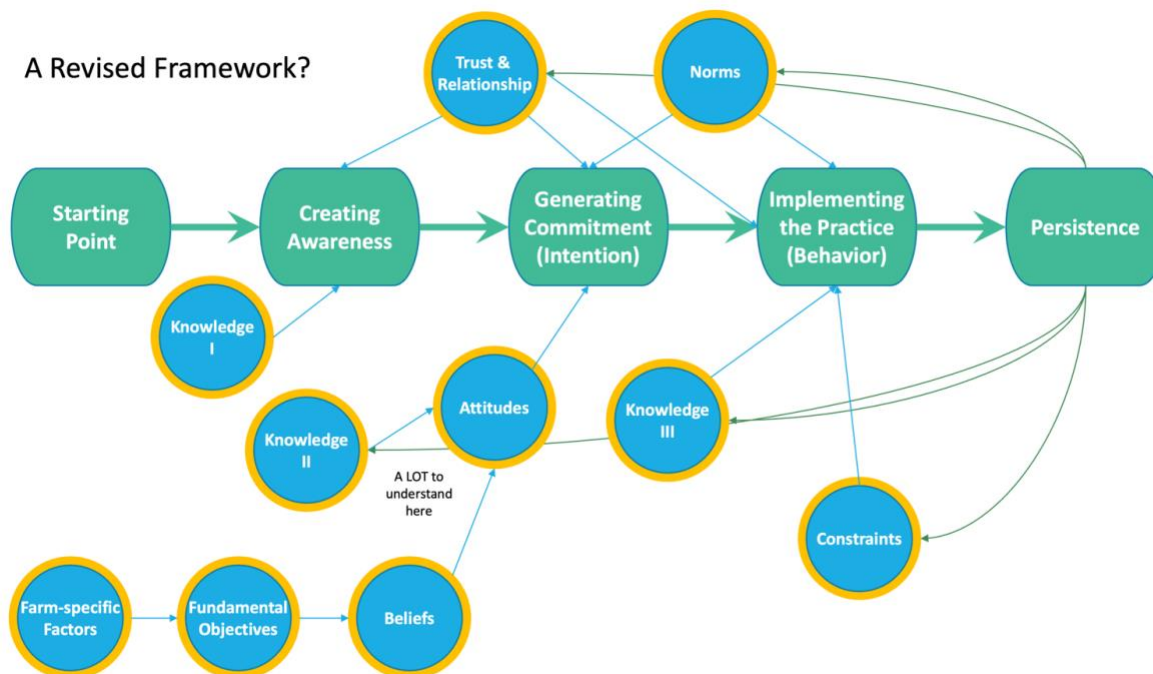


Figure 8. A revised conceptual framework developed during the workshop focused more on component interactions, complexity, and feedback loops. Building on the steering committee’s initial outreach-focused model (Figure 7), this framework adds an explicit stage for commitment to practice maintenance (“Persistence”) and highlights factors (circles) that are important for each stage of adoption (boxes). In addition, it highlights feedback among attitudes, norms, constraints, beliefs, and evolving forms of knowledge. “Knowledge I” represents more general, principle-level information that supports initial awareness, whereas “Knowledge II” and “Knowledge III” reflect increasingly site-specific and farm-specific information needed to inform on-farm decisions. Knowledge II also shapes how farm-specific factors and beliefs are interpreted. The diagram underscores that multiple interacting mechanisms influence movement from the starting point to the long-term persistence of conservation practices.

The model also underscores that the decision factors are neither static nor uniform throughout the adoption pathway. For example, the information needed to support initial awareness differs from the more detailed, locally specific knowledge required to build willingness and capacity for adoption. In this framing, “Knowledge I” represents general, principle-level understanding, whereas “Knowledge II” and “Knowledge III” reflect increasingly site-specific information. Knowledge II also shapes how context and existing beliefs are interpreted in decision making. Participants recognized these dynamics in their own experiences: situations where a strong relationship opened the door, where tailored information eased concerns, where a peer example mattered at the right moment, or where paperwork and permitting became the main barrier. The purpose of presenting this model is not to declare a definitive explanation, but to demonstrate how diverse perspectives raised during the workshop can be integrated into a more comprehensive framework that can be refined over time.

Although the workshop discussion successfully surfaced a wide range of interacting factors, it placed less emphasis on explicitly linking TSP actions and investments to transitions along the adoption pathway. This gap highlights an important opportunity: to move from describing system complexity toward developing approaches that help practitioners strategically target interventions within that system.

6.0 Survey and Evaluation Insight

In addition to recorded breakout discussions, facilitators used a survey during and after the workshop to engage participants. The goal was not to produce a formal statistical analysis, but to understand how practitioners and partners currently view outreach strategies, identify key drivers of adoption, and recognize where evaluation is lacking. The survey was administered using QuestionPro online software (QuestionPro Inc., Austin, TX), included a series of demographic questions, and asked a series of both multiple-choice and open-ended questions on topics related to the workshop.

6.1 Outreach Strategies Across the Adoption Pathways

In one of the sets of questions, the participants were asked what outreach strategies were valuable for advancing adoption of conservation practices, focusing on the stages of the conceptual model in Figure 8. A synthesis of the results showed that participants associated specific strategies with different stages of the conceptual model.

- **Awareness:** Strategies were described as ways to help farmers and landowners hear about practices, see them in action, and become curious enough to ask questions.
 - Field days, farm tours, and on-farm demonstrations.
 - Workshops, meetings, and conference presentations.
 - Newsletters, local media, social media posts, and other communication tools.
 - Peer-to-peer or farmer network activities.
- **Commitment:** At this stage, personalization and sustained engagement were more prominent than broad outreach. For helping people move from interest to a decision to participate or sign up, respondents emphasized:
 - One-on-one conversations and farm visits.
 - Detailed discussions about how a practice would work on a specific operation.
 - Local demonstrations of benefits, including yield, soil health, or risk reduction.
 - Financial incentives and cost-share offers.
 - Formal sign-up processes tied to programs.
- **Implementation:** When describing what it takes to get practices on the ground (and keep them there), practitioners focused heavily on:
 - Helping farmers manage paperwork and navigate program rules.
 - Providing technical assistance during planning and installation.
 - Supporting permitting and engineering steps, especially for structural practices.
 - Coordinating contractors and service providers.
 - Clarifying maintenance responsibilities and providing follow-up support.
- **Persistence:** Strategies at this stage focus on supporting the continued use and maintenance of practices over time, reinforcing positive outcomes, and addressing challenges that arise after initial implementation. Respondents emphasized:
 - Ongoing follow-up support and troubleshooting to address operational challenges.
 - Reinforcing benefits through sharing outcomes and monitoring.
 - Maintaining relationships to sustain engagement and trust.

- Providing clarity and support for long-term maintenance responsibilities.
- Recognizing success to reinforce norms and encourage continued participation.

Many respondents framed this work as removing “last mile” barriers that can stall implementation even after a farmer has agreed in principle. Overall, the survey confirms that outreach efforts already shift in character along the adoption pathway: from broad, visibility-building activities to more personalized support, and then to highly practical, hands-on assistance.

6.2 Perceived Drivers of Adoption

In another question, respondents were asked to indicate which behavioral factor a given strategy was primarily intended to influence. Several patterns emerged:

- **Knowledge** (what farmers understand about practices and their impacts) was often identified as a key driver, especially for awareness-raising activities such as field days, workshops, and other outreach efforts.
- **Constraints** (time, money, equipment, bureaucracy) were commonly linked to implementation support, such as paperwork assistance, permit help, and contractor coordination, highlighting the practical barriers practitioners perceive.
- **Norms** (what peers and the community expect) and **attitudes** (overall views of conservation, risk, and change) often appeared alongside other factors rather than in isolation, indicating that participants see social expectations and personal opinions as connected to knowledge and practicality.
- Many responses explicitly combined factors (e.g., “knowledge/norm/attitude,” “benefits and constraints”) instead of identifying a single cause.

These responses indicate that participants do not view outreach as targeting a single driver at a time. Instead, strategies are perceived as influencing multiple decision-making factors simultaneously, depending on the context and the individual farmer or landowner.

6.3 Survey Synthesis

Taken together, the survey results reinforce several themes from earlier sessions:

- **Awareness is not the main bottleneck.**
Most respondents described robust awareness activities and noted that many farmers already know, in general terms, that conservation practices exist.
- **Feasibility and constraints are central concerns.**
The heavy emphasis on paperwork assistance, permitting, and other implementation support, along with the frequency with which “constraints” were named as a key factor, suggest that many practitioners see the main barriers as practical and procedural rather than purely attitudinal.
- **Multiple mechanisms are at work.**
The tendency to name combinations of knowledge, norms, attitudes, and constraints

rather than a single factor aligns with workshop discussions about the interdependence of mechanisms such as trust, information relevance, incentives, and operational barriers.

- **Practitioners are already thinking in terms of stages.**

By distinguishing between awareness, commitment, and implementation in their responses, participants implicitly recognize that different tools are needed at different points along the adoption pathway.

These patterns lend support to the idea that outreach should be understood and evaluated as a multi-stage, multi-mechanism process rather than a single event or message.

6.4 Limits of Current Evaluation and Opportunities for Learning

Workshop discussions around the survey results highlighted several limitations in current evaluation efforts:

- Many programs **track acres or contracts** but collect limited information about why farmers chose to adopt or not adopt, or what happened over time.
- There is relatively little systematic information about **persistence** (whether practices are maintained) and **de-adoption** (when and why they are discontinued).
- The roles of **trust, norms, and identity** are widely acknowledged but rarely measured in a consistent way.
- Outreach activities are often documented for reporting purposes but not linked to structured hypotheses about which mechanisms they are intended to influence.

Participants expressed interest in approaches that enable outreach programs to learn more systematically from their own work—by clarifying their expected outcomes, tracking relevant indicators over time, and comparing experiences across projects and regions. These reflections highlight an opportunity for the CBP partnership to **support more coordinated evaluation and learning, including standard methods for describing outreach strategies, shared indicators of key behavioral drivers (e.g., knowledge, constraints, norms, attitudes, trust, and risk perceptions), and simple tools for connecting outreach activities to observed results**. Such efforts would not replace existing reporting requirements but could make it easier to identify which combinations of approaches work best for specific farmers and practices, and under what conditions.

Although breakouts and panel conversations covered a wide range of topics and local experiences, several themes appeared consistently:

- **Farmers and landowners operate under tight constraints and real risk.**
- Participants emphasized that **decisions about conservation practices are made alongside many other pressures**: volatile markets, weather uncertainty, time-sensitive field operations, and limited labor. These realities often explain why even interested farmers hesitate or delay adoption.
- **Relevance of information is critical.** Practitioners and farmers stressed that information is most useful when it directly addresses the operation in question (e.g., specific soils, rotations, equipment, and financial circumstances). General messages about water quality or “doing the right thing” were viewed as supportive but not sufficient.

- **Relationships and trust carry significant weight.** Breakouts repeatedly emphasized the importance of long-term, consistent relationships between farmers and outreach staff, as well as trust in local institutions. Trust was framed not just as “liking” someone, but as believing they understand the operation, will be honest about tradeoffs, and will follow through.
- **Peer influence and community norms can accelerate or slow change.** Many examples illustrated how adoption clustered in communities where early adopters were visible and respected, and how efforts struggled where practices were perceived as unusual or associated with outside pressure.
- **Identity and stewardship values matter for some decisions.** Farmers’ sense of themselves as stewards, their concern for future generations, and their desire to be seen as good managers sometimes tipped the balance in favor of adoption, even when incentives or logistics were challenging.

These themes align closely with the models described in Session III and the interdependencies discussed in Session IV, and provide concrete examples that make those ideas more grounded in practice.

6.5 Areas of Emerging Agreement

Despite differences in geography, programs, and roles, breakout groups and panelists converged on several broad points:

- **Awareness is generally not the primary barrier.** Participants agreed that in many parts of the region, farmers and landowners are already aware that conservation practices exist. The more pressing challenges often arise later, when they are weighing whether and how to apply those practices on their own land.
- **Practical constraints are a major limiting factor.** There was broad agreement that time, labor, equipment availability, and administrative complexity frequently block adoption and persistence, even when interest is high. Many participants described constraints as the “last mile” problem that programs need to address more directly.
- **Multiple mechanisms are at work at once.** Very few people felt comfortable pointing to a single cause (for example, “just attitudes” or “just money”) as the main explanation for adoption outcomes. Instead, they described a mix of trust, information, norms, feasibility, and personal values, with different elements coming to the foreground in different situations.
- **There is value in being more explicit about goals and stages.** Participants emphasized the value of outreach practitioners and TSPs being more explicit about their goals and the stage of the adoption pathway they are targeting, as this clarity helps align strategies, expectations, and evaluation efforts (see Section 8.3).

This emerging agreement suggests that many people in the Chesapeake Bay community are already thinking in terms of stages and interacting mechanisms, even if they use different language or have not formalized these ideas into a shared framework.

6.6 Uncertainties

At the same time, the breakout notes and panel reflections made it clear that important uncertainties remain:

- **Timing and sequencing are not well understood.** Participants expressed uncertainty about when along the consultation trajectory to focus on relationship-building, when to emphasize technical details, and when to introduce financial incentives. Experiences varied, and there was no consensus on a single “right order.”
- **The capacity to influence attitudes and beliefs is debated.** Some participants felt that attitudes are relatively stable and difficult to change directly, suggesting that programs could focus more on feasibility and reducing risk. Others believed that communication and peer examples can shift attitudes over time, especially when tied to visible results.
- **Engagement of non-operator landowners is still a challenge.** Breakout groups repeatedly highlighted uncertainty about how best to reach and support non-operator landowners and managers, who often make or influence decisions about structural practices but may be less connected to existing outreach channels.
- **Persistence and de-adoption are poorly documented.** Although many practitioners reported anecdotal examples of practices being discontinued after contracts ended or after one bad experience, there is little systematic information about how often this occurs or what factors are most important.

These uncertainties point to areas where additional learning and collaboration could be especially valuable.

7.0 Post-Workshop Reflections

The workshop was designed to initiate the development of a framework to help technical service providers (TSPs) identify the most strategic pathways for engaging producers in adopting conservation practices. In doing so, it also explored the relationship between knowledge and trust as a basis for evaluating the claim that “we have enough science.” Participants were challenged to develop a predictive model to estimate the likelihood of success for different outreach strategies.

Several key insights emerged.

First, conservation adoption is primarily a decision-making problem under uncertainty, not just an outreach issue. Although participants could identify many outreach activities, it was harder to determine how these activities affect producer decisions or how to prioritize among them. This underscores the need for frameworks that clearly connect actions to expected outcomes under different conditions.

Second, outreach actions are easier to identify than the mechanisms through which they operate. Participants quickly listed TSP activities aligned with different stages of adoption. However, there was more uncertainty about how these activities influence key decision factors—such as beliefs, attitudes, norms, constraints, and knowledge—or which of these factors are most influential in shaping producers’ views. This gap highlights an important area for future research and model development.

Third, the connection between knowledge and trust is more complicated than often believed. Although some views emphasize shifting focus away from creating new knowledge toward addressing attitudes, beliefs, and trust, others, especially from participatory modeling, highlight the importance of knowledge co-production in building trust and shared understanding. The workshop suggests that these views are not mutually exclusive; rather, different outreach strategies may influence different decision factors, and their effectiveness likely depends on context.

Finally, there is ongoing discomfort with the use of formal modeling as a decision-support tool. Although participants were tasked with developing predictive models, they tended to shift away from explicit modeling toward more descriptive approaches. This reflects both the complexity of the system and the uncertainty about key drivers of behavior. At the same time, it highlights a broader need to normalize the use of modeling within outreach and decision-making contexts, particularly by making models more accessible, iterative, and integrated into existing consultation processes rather than treating them as specialized or standalone exercises.

These insights are reflected in Figure 9, which conceptualizes adoption as a staged, context-dependent process in which TSPs allocate effort across intervention points to influence decision factors and increase the probability of progression between stages. By explicitly linking actions,

mechanisms, and outcomes, the model provides a foundation for structured decision making and adaptive management.

More broadly, the workshop highlighted the importance of connecting social science frameworks with consultation processes used in structured decision making. Eliciting beliefs, attitudes, and norms is central to effective problem framing and to identifying shared objectives, and credible evaluation depends on knowledge sharing and, in many cases, on co-development of models. Strengthening these connections may help bridge disciplinary divides and support more effective, collaborative approaches to the adoption of conservation practices.

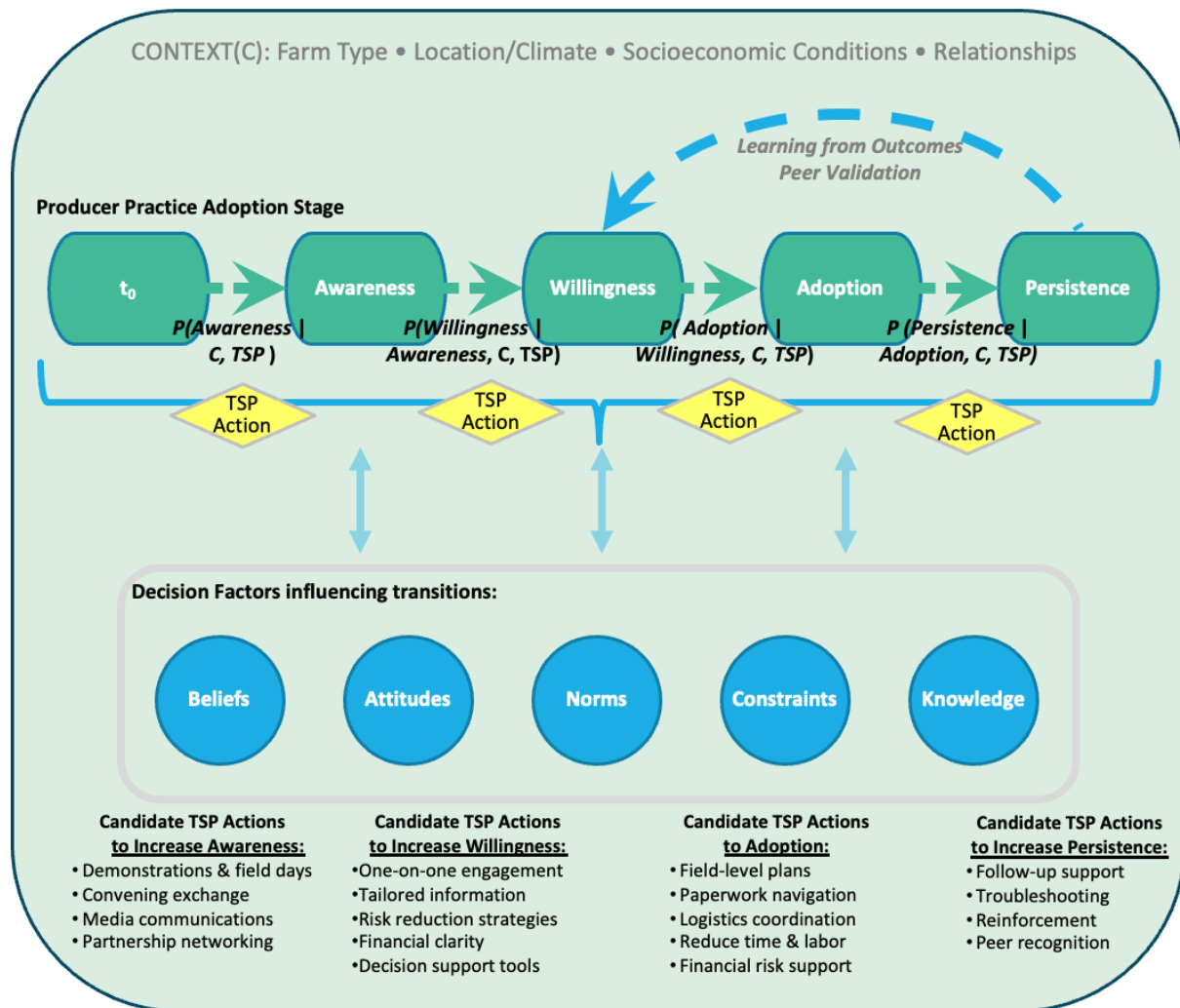


Figure 9. Conceptual model of conservation practice adoption as a staged, context-dependent decision process. Producers move through stages from awareness to willingness, adoption, and persistence. At each transition, technical service providers (TSPs) allocate effort across intervention points to increase the probability of progression, conditional on context (C). TSP actions influence outcomes by targeting key decision factors—including beliefs, knowledge, attitudes, norms, and constraints—which shape transition probabilities between stages. Successful implementation and persistence can reinforce future willingness through learning from outcomes and peer validation, creating a feedback loop that informs subsequent decisions.

8.0 Synthesis and Pathways Forward

8.1 What the Workshop Achieved

Participants identified several ways in which the workshop moved the conversation forward:

- **Shared language:** The workshop gave people working in different parts of the system (farmers, land managers, conservation staff, funders, and researchers) a common vocabulary for talking about adoption (awareness, willingness, commitment, implementation, persistence; trust; constraints; norms; identity).
- **Range of perspectives:** By surfacing multiple models of adoption, participants could see that their colleagues' experiences and assumptions were not identical, even when they were working toward the same goals. This heterogeneity was viewed as a strength rather than a problem.
- **Clarified uncertainties:** Discussions and survey results helped pinpoint where there is broad agreement (for example, that constraints and feasibility matter greatly) and where understanding is still limited (for example, the timing of different outreach tools or how best to engage non-operator landowners).
- **Relationship-building:** Many participants noted the value of simply hearing from others in different roles and geographies and expressed interest in staying connected after the workshop.

These accomplishments are modest in one sense: no single meeting can solve adoption challenges. However, these are important as a foundation because they represent the kind of shared work that can promote community action and lead to effective formal changes in programs, partnerships, or research efforts.

8.2 From Framework to Testable Ideas

Several participants emphasized that the revised framework would be most useful if it could eventually guide real decisions about outreach and program design. To do that, it would need to be translated into **practical, testable ideas**, such as:

- For a given practice type and farmer group, which outreach strategies seem most important at each stage of the adoption pathway?
- When programs invest in relationship-building, tailored information, peer networks, incentives, and constraint reduction, how do those pieces work together?
- Under what conditions do a particular combination of efforts appear to lead to higher rates of adoption or longer persistence?

Participants suggested that programs already collect many pieces of relevant information about contacts, outreach events, sign-ups, implementation, and practice maintenance, but that these data are not always organized in ways that make it easy to learn from experience across projects or years.

Importantly, the intent of using a modeling framework for the discussion was not to present as a ready-made evaluation tool, but as a starting point for thinking about how outreach records, survey questions, and follow-up efforts could be aligned with clearer expectations about what different strategies are intended to influence at various stages of the adoption pathway. Viable strategies and their likelihood for success will depend on context. However, the exercise provides a framework to guide the TSP decision-making process. It also helps identify where uncertainty limits the ability to make informed decisions about outreach investments.

8.3 Learn-While-Doing: Embedding Learning in Ongoing Work

A recurring idea was that much of the learning needed to improve conservation adoption could occur within existing outreach and implementation programs if those programs are designed with learning in mind. Participants described this as “learning while doing”, in contrast to stand-alone studies that are separate from day-to-day work.

Participants identified several practical steps:

- **Be explicit about goals by stage:** When planning outreach activities, clarify whether the primary aim is to increase awareness, build willingness, secure commitment, support implementation, or encourage persistence—and which mechanisms (trust, information, norms, constraints, identity) the activity is intended to influence.
- **Record what was tried and why:** Document the main outreach approaches used, the audiences they reached, and the reasoning behind them.
- **Track a small number of key indicators:** Where possible, add simple questions or observations to gauge whether trust, perceived feasibility, or other factors are shifting, rather than tracking only acres or contracts.
- **Compare and adapt:** Periodically look across projects, watersheds, or partner organizations to see what patterns emerge and use those insights to adjust future efforts.

Participants acknowledged that staff capacity is limited, and that any additional data collection must be realistic. However, there was interest in exploring ways to make small adjustments that could, over time, support more shared learning across the CBP partnership.

8.4 A Longer-Term Vision for the Chesapeake Bay Program

Looking ahead, discussions pointed to a longer-term vision in which the CBP and its partners:

- Support **coordinated efforts** to describe outreach strategies and adoption contexts in similar ways across projects and jurisdictions.
- Encourage **partnerships between practitioners and researchers** to design, pilot, and refine evaluation approaches in practice.
- Explore opportunities to connect social and behavioral insights with existing **biophysical models** and planning tools, so that expectations about adoption and persistence are more grounded in experience.

- Continue to create spaces like this workshop for staff, farmers, landowners, and researchers to share what they are seeing, question assumptions, and refine shared frameworks.

The workshop itself was framed as a chance to listen, compare, and begin to assemble a picture of conservation adoption that reflects both research and lived experience. Although not novel in recognizing the importance of outreach, behavior, or decision support individually, the report is distinctive in integrating these perspectives into a stage-based framework that connects outreach strategy, consultation, and structured decision making. Participants expressed interest in building on this work, recognizing that progress toward widespread and enduring adoption will depend not only on the availability of effective practices but also on how well outreach and programs support the people making decisions on the land.

Taken together, the breakout notes and panel reflections provide strong, experience-based support for a more systematic approach to understanding and improving conservation adoption. In particular, they suggest that:

- **It is useful to keep talking in terms of multiple explanations, not just one.**
The six models in Session III reflect how practitioners and farmers already think about their work. Breakout and panel contributions show that these models are grounded in real-world, observed patterns and can serve as starting points for more deliberate planning and evaluation.
- **There is interest in learning more from existing efforts.**
Many participants expressed a desire to better understand which combinations of outreach strategies work best in which contexts, and how they might adjust approaches based on that knowledge. This interest provides a foundation for “learning while doing” within current programs.
- **Shared frameworks can help coordinate efforts without prescribing a single method.**
The revised adoption framework presented in Session VI was generally seen as a helpful way to organize thinking about adoption, and left room for different outreach approaches and local conditions. It can serve as a common reference point for conversations among practitioners, managers, and researchers.
- **Relationships built through the workshop are themselves part of the solution.**
Finally, the connections formed during breakout discussions and the closing panel—across agencies, organizations, and disciplines—are an important outcome. They create opportunities for future collaboration, joint pilots, and shared learning that go beyond the scope of any one project or program.

In this sense, the workshop did more than gather information; it began to build relationships, shared language, and an initial framework needed for the Chesapeake Bay community to work together on a more coordinated, evidence-informed approach to supporting the adoption of conservation practices across the watershed.

9.0 Recommendations Compiled from the Workshop

Workshop discussions, survey responses, and panel reflections identify a set of practical steps that various parts of the Chesapeake Bay community can take to improve the adoption of conservation practices. These recommendations are organized by audience, recognizing that many organizations play more than one role.

9.1 Outreach Practitioners and Technical Service Providers

- 1. Be explicit about the stage you are working on.**
When planning outreach, consider whether the primary aim is to build awareness, strengthen willingness, secure commitment, support implementation, or encourage long-term persistence and adjust your strategies accordingly. This helps ensure that activities and messages are suited to where farmers and landowners are in their decision-making process.
- 2. Invest in relationships and continuity.**
Where possible, prioritize consistent staffing and long-term presence in communities. Farmers and landowners are more likely to discuss concerns, acknowledge uncertainty, and try new practices when they have ongoing relationships with people they trust. Small investments in continuity can pay off over time.
- 3. Tailor information to specific operations.**
Whenever feasible, move beyond general messages about conservation benefits to provide farm-specific information about how a practice will affect yields, timing, labor, and risk. This may involve more one-on-one conversations, on-site visits, or use of local examples that closely match the operation in question.
- 4. Address practical constraints as part of outreach.**
Recognize that implementation often fails not because interest is lacking, but because paperwork, permitting, contractor coordination, and maintenance feel overwhelming. Consider ways to reduce these burdens—by helping complete forms, providing checklists, coordinating with engineers or contractors, and setting realistic expectations about maintenance.
- 5. Use peer networks and local leadership intentionally.**
Field days, farmer panels, and informal peer networks are already common. Where possible, identify and support local champions whose experience and credibility can encourage others. Make space for farmers to share both successes and challenges so that peers can learn from realistic examples.
- 6. Document what you try and what you learn.**
Within existing reporting requirements, consider adding brief notes on which strategies were used for which audiences and what seemed to help or hinder adoption. Over time, these observations can inform adjustments and provide valuable input to broader learning efforts across the region.

9.2 Social Scientists and Research Institutions

1. **Build on the familiar sub-models and questions practitioners already use by exploring interconnections, feedback loops, and dynamics of the decision factors in a system's context.**

Participants gravitated to six models discussed in the workshop (centered on trust, information relevance, norms, incentives, constraints, and identity), which reflects how practitioners and farmers already think about conservation adoption. Future research can use these as starting points, translating them into clearer hypotheses to explore the role of different outreach strategies and making them more testable without losing their connection to lived experience.

2. **Focus on key uncertainties identified by practitioners.**

Workshop participants highlighted several areas where better understanding is needed:

- What social networks and peer influence shape decisions.
- How non-operator landowners make and influence conservation choices.
- What drives long-term persistence and de-adoption of practices.
- How timing and sequencing of outreach affect outcomes.

Research that directly addresses these questions could inform programs.

3. **Design studies that fit within ongoing programs.**

Where possible, seek opportunities to embed research and evaluation in existing outreach and implementation efforts. This could include simple additions to intake forms or follow-up surveys, joint development of indicators, or co-designed pilots that compare different outreach approaches.

4. **Measure more than acres and contracts.**

Work with practitioners to identify a small set of feasible indicators related to trust, perceived feasibility, norms, and identity that can be tracked alongside traditional metrics. Even a few well-chosen questions, repeated consistently, can provide insights into how and why adoption is changing.

5. **Communicate findings in ways that are practical for decision making.**

When sharing research results, highlight what they indicate about how to target outreach, which combinations of strategies seem most effective, and how programs might evolve over time. This helps ensure that empirical work guides real-world decisions.

9.3 Chesapeake Bay Program and Funding Partners

1. **Support coordinated descriptions of outreach strategies and contexts.**

Encourage use of common terms to describe outreach activities (e.g., field days, one-on-one visits, peer programs, paperwork assistance) and adoption stages (awareness, willingness, commitment, implementation, persistence) in grant applications and reporting. This can make it easier to compare experiences across projects and jurisdictions.

2. **Invest in reducing “last mile” barriers.**

Consider dedicating funding and staff time specifically to functions that reduce implementation friction—such as permit navigation, engineering support, contractor coordination, and maintenance planning. These roles are often under-resourced but can have large effects on whether practices move from contract to reality.

3. **Encourage partnerships between practitioners and researchers.**
Create incentives for projects that bring together local conservation staff, farmers, and social scientists to co-design outreach strategies and learning plans. This might include targeted grant programs, technical assistance opportunities, or support for multi-organization teams.
4. **Pilot and evaluate different combinations of outreach approaches.**
Where feasible, support pilot projects that compare different outreach “packages” for specific practices or audiences (for example, relationship-heavy vs. incentive-heavy approaches, or different sequences of peer outreach and technical assistance). Encourage simple, transparent documentation of what is tried and what outcomes are observed.
5. **Integrate behavioral insights into planning and modeling.**
As the Bay Program continues to refine its planning tools and models, consider how assumptions about adoption and persistence might better reflect what practitioners and research have learned about trust, constraints, norms, and identity. Even small adjustments in these assumptions can lead to more realistic expectations about what programs can achieve, and on what timeline.
6. **Create ongoing spaces for shared learning.**
Build on this workshop by supporting periodic opportunities—whether regional meetings, webinars, or communities of practice—for farmers, practitioners, program managers, and researchers to share experience, revisit frameworks, and refine priorities. Over time, these spaces can help sustain the relationships and shared understanding needed for more coordinated action.

9.4 Cross-Cutting Recommendation: Learn from Practice Over Time

Across all audiences, a common theme is the desire to **learn more systematically from ongoing work**. The workshop highlighted that many of the ingredients for learning—experience with a variety of outreach strategies, long-standing relationships, and a growing awareness of multiple adoption mechanisms—are already in place. The next step is to be more deliberate about:

- Clarifying what each activity is intended to influence.
- Recording key aspects of the context and approach.
- Tracking indicators related to decision making, not just installed practices.
- Comparing results over time and across places.

This does not require a single, rigid framework or a large new data system. **Instead, it calls for a gradual shift toward viewing outreach and implementation efforts as opportunities not only to deliver assistance but also to better understand how conservation adoption occurs across different parts of the watershed—and to adjust approaches accordingly.**

By working together in this way, practitioners, researchers, and the CBP can continue to refine their understanding of what helps farmers and landowners move from awareness to long-term practice and make more informed decisions about how to invest time and resources in support of the Bay’s restoration goals.

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Advancing Outreach Effectiveness to Improve Conservation Practice Adoption

a virtual series of morning coffee hours to improve private public partnerships

January 26 - 28, 2021, 9:00 am to 1 pm, EST

Rationale: Despite increasing knowledge about where agricultural best management practices (BMPs) can provide exceptional benefits to soil and watershed health, practice adoption rates are not on track to meet restoration goals. Outreach practitioners report that increasing adoption requires building trust with farmers; however, engagement strategies, incentive devices, and perceived barriers vary widely even within organizations. It is unclear whether slow adoption rates in high priority locations reflect a lack of feasibility given other stakeholder concerns, perceived risks associated with inadequate technical information, insufficient incentives to outweigh economic costs, public program complexities, ineffective communication strategies, or even limited knowledge and biases by outreach practitioners. To improve outreach effectiveness and best meet farmer and landowner interests for their agricultural operations, please join the Foundation for Food and Agriculture Research (FFAR) and our partners for a three-day series of connected, interactive discussions among farmers, outreach practitioners, and social scientists.

Workshop Objectives:

- Share outreach strategies and synthesize lessons learned by practitioners and researchers to increase the adoption of agricultural conservation practices.
- Explore alignment between applied outreach strategies and our understanding of behavioral influences and decision-making by farmers and growers.
- Identify research gaps and collaborative opportunities to increase agricultural conservation practice adoption.

Who Is Invited: Approximately 100 experts including farmers, outreach practitioners (NGOs, state and federal agencies, private technical service providers), program managers (e.g., NRCS, SCD, FSA, State Cost Share programs), and social scientists who work in the Chesapeake Bay watershed or the Great Lakes and Upper Mississippi River basins.

Organizing Committee: Kathy Boomer (chair, FFAR), Amy Jacobs (TNC), Collin Weigel (JHU), Robyn Wilson (OSU), Linda Prokopy (Purdue), Michael Runge (USGS), Jake Reilly (NFWF), Rochelle Krusemark (USFRA), Paul Wolfe (Walton Family Foundation), Allison Thompson (Field to Market), Christine Conn (MD DNR)



Thank you sponsors!

Advancing Outreach Effectiveness to Improve Conservation Practice Adoption

January 26 - 28, 2021, 9:00 am to 1 pm, EST

Workshop Approach: The workshop consists of six sessions strategically woven together to explore how well outreach strategies address farmer concerns related to conservation practice adoption. The first four sessions use a combination of polls and targeted discussion questions to collect information that will enable us to explore this intersection. We will present results on the third day and finish with a discussion of emerging ideas for improving outreach effectiveness.

Day 1, January 26th:

- 9:00 Optional Tech Check-In
- 9:30 **Welcome and Introductions:** Welcome and Sponsor Introductions; 2) The Pocomoke River Case Study and Workshop Genesis, 3) Workshop Introduction: Setting the Decision Context; 4) Participant Introductions; 5) Introduction of Workshop Framework
- 11:30 **Understanding Stakeholder Priorities Related to Conservation Practice Adoptions:** Panel Discussion and Facilitated Exchange

Day 2, January 27th:

- 9:00 Optional Tech Check-In and Breakout Coffee Room
- 9:30 Welcome Back and Shared Reflections
- 9:45 **Assessing Potential to Influence Operator Decisions:** Following a session overview, breakout discussions will provide a basis for anticipating how farmers might respond to selected outreach strategies.
- 11:30 **Outreach Strategy Exchange:** Rapid response, lightning rounds will allow participants to share preferred outreach strategies based on conservation practice type and land tenure. Follow-up discussions will provide an opportunity to reflect on the shared information.

Day 3, January 28th:

- 9:00 Optional Tech Check-In and Breakout Coffee Room
- 9:30 Welcome Back and Shared Reflections
- 9:45 **Cross-Walking Perspectives:** A summary of the information exchange sessions on Day 1 and Day 2 will provide a basis to explore how well preferred outreach strategies align with farmer's concerns and our understanding of decision-making related to the adoption of conservation practices. Follow-up breakout sessions will allow participants to reflect and react to the findings.
- 11:30 **Tying It Together: Key Take-Aways and Next Steps:** Panel & group discussion.

Appendix B: Workshop Participants

Name	Organization	Email Address	Role	Region
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Appendix C: Key Definitions

Adoption: This is the point at which someone actually adopts a practice or program. Of course, there can be varying levels of adoption even at this stage.

Behavioral Intention/Willingness to adopt: Prior to actual adoption of a practice or program, a person first has to become willing to adopt it. There is not a clear path from behavioral intention to actual adoption as many things can interfere in this process, including inertia and *actual behavioral control* (defined as a person's ability to control the behavior which might not be clear until they actually try to move forward with adoption and then realize they don't have the necessary permits, it costs more than expected, etc.)

Beliefs/values: These are deep-seated beliefs or values about the world. These are very hard to change.

Constraints/Barriers: broadly anything in the local to national (or even international) context that makes it hard to form or act on one's intentions to engage in conservation. So, social constraints (e.g., my neighbors will disapprove), economic constraints (e.g., there is no return on investment, the incentives offered are too small), physical constraints (e.g., weather uncertainty, lack of equipment), etc. Specific constraints often found to limit adoption:

- **Attitudes:** Attitudes are easier to change than beliefs/values. For adoption decisions, attitudes toward a specific practice or program are important, e.g. having a positive attitude towards the cost of a program or the benefits emerging from a practice.
- **Perceived behavioral control:** An individual's perception of their ability to control a specific decision.
- **Norms:** Two common types of norms influence decision making: *Descriptive norms* – what are other people around me doing? And *subjective norms*- what do people I trust and respect think I should do?

Edge-of-Field Practices: Engineered modifications placed along field edges or in-field waterways to reduce nutrient and sediment loss. These include conservation drainage water management, grass buffers, saturated buffers, level-lip spreaders, terraces, and sediment control.

Edge-of-Stream Practices: Engineered modifications placed adjacent to surface waters to reduce nutrient and sediment loss and store water. These include conservation restored wetlands, riparian buffers.

Infield Conservation Practices: Modifications to cropping systems to provide multiple conservation benefits like building soil health, improving water quality and reducing erosion. Practices include cover crops, no-till planting, buffer and filter strips.

Knowledge/awareness: Having information specific to an opportunity (program, event, etc.) or practice.

Natural Filters: Wetlands restored, created, or managed to intercept and sequester pollutants, usually excess nutrients and sediment but also other chemicals of emerging concern.

Non-operator Landowner – person that owns agricultural land and has another person perform the farming/ management of the land

Owner operator – person that owns agricultural land and performs all of the farming/ management of that land

Persistence: This is the action of continuing to use a practice over time vs. discontinuing use.

Renter operator – person that rents or leases agricultural land from another person and who performs the farming/ management of the rented land

Appendix D: List of Figures

Figure 1. No-till and strip-till adoption on corn, cotton, soybean, and wheat acres by U.S. farm resource region, 2010-11. Pie charts show the share of crop acreage on farms that used no-till/strip-till on every acre (full adopters), used a mix of no-till/strip-till and other tillage on some acres (partial adopters), or did not adopt no-till/strip-till (nonadopters). Source: Wade et al. (2015), using USDA-NASS Agricultural Resource Management Survey (2010-11). 7

Figure 2. Cover crops as a percent of cropland by U.S. farm resource region, 2010-11. Bars show the percent of total cropland acres planted to cover crops, highlighting substantial regional variation. *Note:* Cover crop estimates are reported relative to all planted cropland acres (not limited to corn, soybean, wheat, and cotton). Source: USDA Economic Research Service (ERS) and USDA National Agricultural Statistics Service (NASS), Agricultural Resource Management Survey (ARMS), 2010-11. 8

Figure 3. Example from the opening session on decision framing, linking watershed prioritization to farm-scale conservation options. The figure illustrates how priority areas identified at the watershed or sub-watershed scale can be used to focus attention on a particular farm tract, where multiple conservation practices may be considered. This example highlights how site conditions and operational realities shape what is feasible and relevant for outreach. .. 14

Figure 4. Conceptual framework for conservation practice adoption and persistence (merged Theory of Planned Behavior and Diffusion of Innovations). Background factors and practice characteristics shape attitudes, norms, and perceived behavioral control, which influence intention, behavior (adoption), and persistence over time. The arrow represents the causal and temporal direction of behavior. *Source:* Linda S. Prokopy, Purdue University, workshop presentation, January 26, 2021. Based on: Arbuckle and Roesch-McNally (2015); Fishbein and Ajzen (2010); Reimer et al. (2012); Rogers (2003). 17

Figure 5. Structured decision-making framework adapted to conservation outreach strategy selection, to guide effort and funding among alternative outreach strategies. In this adaptation, outreach strategies are the alternatives under consideration, and the central challenge is to evaluate which strategy mix is most likely to increase adoption of conservation practices and associated ecosystem benefits in a particular landscape or community. Source: Runge et al. (2013). 22

Figure 6. Behavior change pathway highlighting practitioner intervention points (cognitive vs. technological/structural strategies). *Source:* Dr. Robyn S. Wilson, Ohio State University, written communication, October 26, 2020. 23

Figure 7. An early conceptual change model linking outreach intervention points to increase the adoption of conservation practices. The model highlights when and how outreach and technical assistance could influence the probability of shifting a land manager or producer along the awareness–commitment–implementation/adoption pathway. The numbered TSP actions (TSP 1, TSP 2, etc.) are generic placeholders for whatever outreach strategies are designed to facilitate the specific transitions in the model..... 24

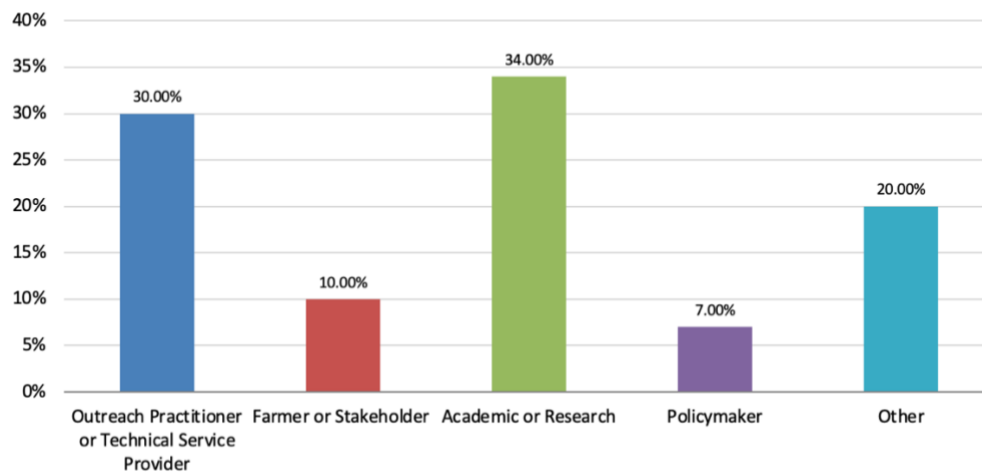
Figure 8. A revised conceptual framework developed during the workshop focused more on component interactions, complexity, and feedback loops. Building on the steering committee’s initial outreach-focused model (Figure 7), this framework adds an explicit stage for commitment to practice maintenance (“Persistence”) and highlights factors (circles) that are important for each stage of adoption (boxes). In addition, it highlights feedback among attitudes, norms, constraints, beliefs, and evolving forms of knowledge. “Knowledge I” represents more general, principle-level information that supports initial awareness, whereas “Knowledge II” and “Knowledge III” reflect increasingly site-specific and farm-specific information needed to inform on-farm decisions. Knowledge II also shapes how farm-specific factors and beliefs are interpreted. The diagram underscores that multiple interacting mechanisms influence movement from the starting point to the long-term persistence of conservation practices. 31

Figure 9. Conceptual model of conservation practice adoption as a staged, context-dependent decision process. Producers move through stages from awareness to willingness, adoption, and persistence. At each transition, technical service providers (TSPs) allocate effort across intervention points to increase the probability of progression, conditional on context (C). TSP actions influence outcomes by targeting key decision factors—including beliefs, knowledge, attitudes, norms, and constraints—which shape transition probabilities between stages. Successful implementation and persistence can reinforce future willingness through learning from outcomes and peer validation, creating a feedback loop that informs subsequent decisions. 38

Appendix E: Participant Responses to QuestionPro Survey

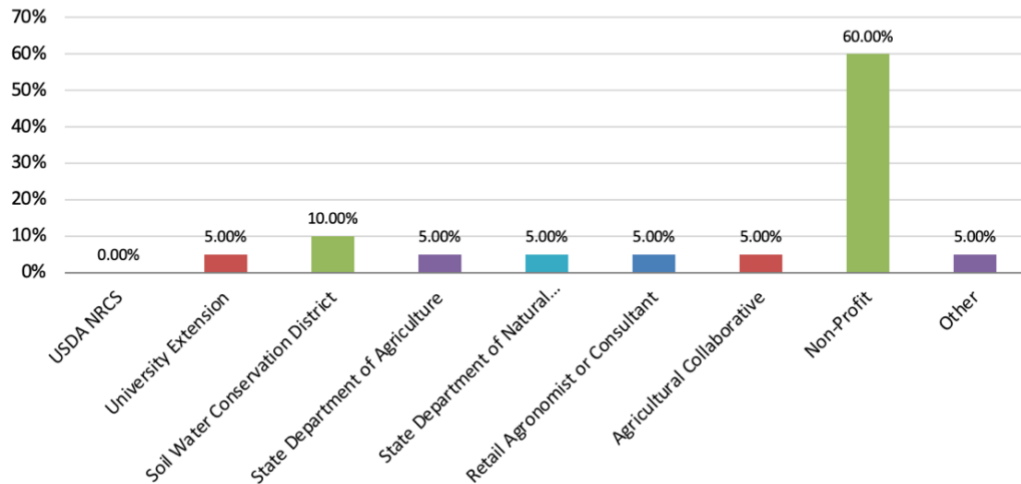
This appendix provides summary results from the QuestionPro survey administered during and after the workshop. Figures in this appendix summarize respondent characteristics (sector and organizational affiliation) and the geographic context in which respondents primarily work (USDA Farm Resource Regions and major U.S. water resource regions). Percentages are calculated using the number of respondents who answered each question; totals may not equal 100 percent because of rounding and “Other” responses. Descriptive statistics displayed on the figures are automated outputs from the survey platform and are provided for reference.

Which sector do you represent?



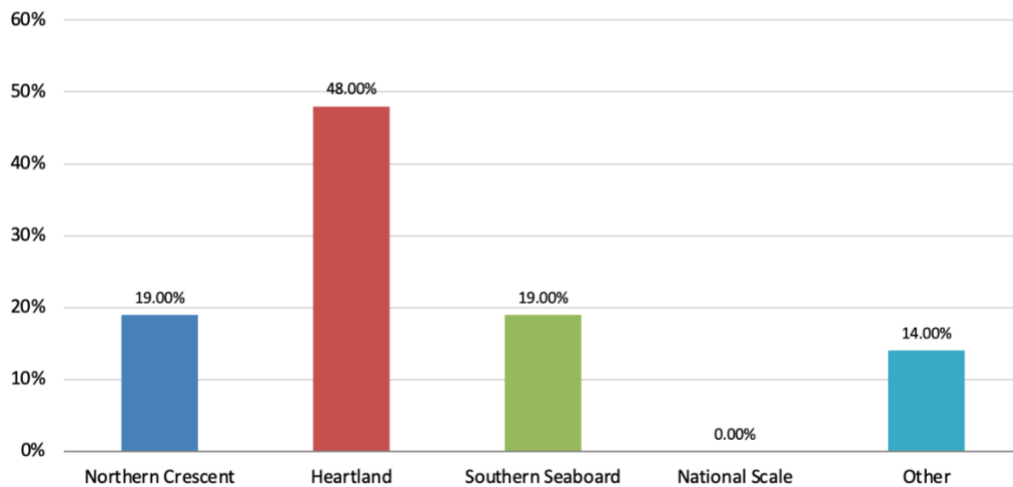
Mean : 2.775 | Confidence Interval @ 95% : [2.436 - 3.113] | Standard Deviation : 1.456 | Standard Error : 0.173

What is your affiliation?



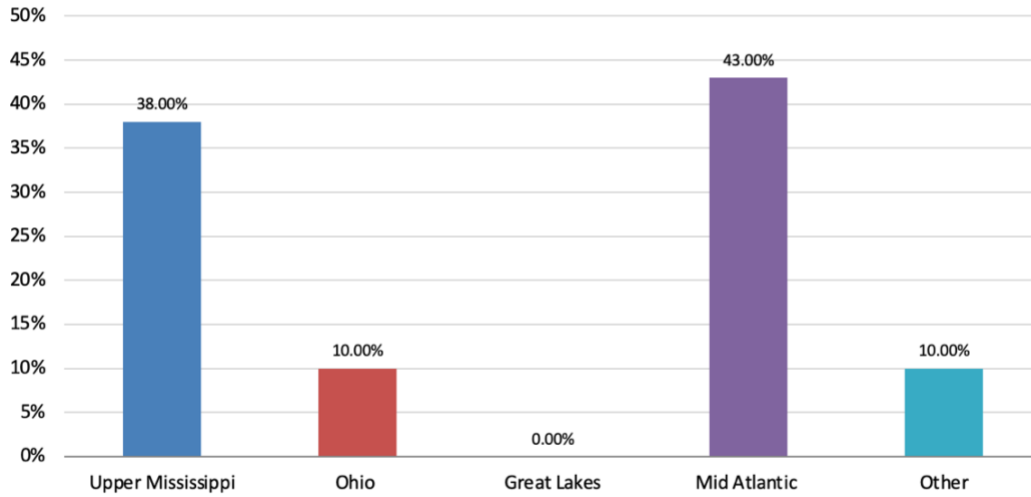
Mean : 6.750 | Confidence Interval @ 95% : [5.819 - 7.681] | Standard Deviation : 2.124 | Standard Error : 0.475

Within which USDA Farm Resource (agro-ecosystem) Region do you mostly work?



Mean : 2.429 | Confidence Interval @ 95% : [1.895 - 2.962] | Standard Deviation : 1.248 | Standard Error : 0.272

Within which major US water resource region do you mostly work?



Mean : 2.762 | Confidence Interval @ 95% : [2.087 - 3.437] | Standard Deviation : 1.578 | Standard Error : 0.344