

Advancing Market-Based Approaches in the Agricultural Sector to Support Chesapeake Bay Watershed Restoration (STAC Workshop Report)

*Leah Palm-Forster, University of Delaware
CBP STAC Workshop Co-chair*



Palm-Forster, L., L. Wainger, Y. Kuwayama, K. Stephenson, D. A. Newburn, K. Brownson, M. Cole, J. Beckett, S. Knoche, and E. Campbell. 2026. Advancing Market-Based Approaches in the Agricultural Sector to Support Chesapeake Bay Watershed Restoration. STAC Publication Number 26-004, Edgewater, MD. 72 pp. [Download here](#)

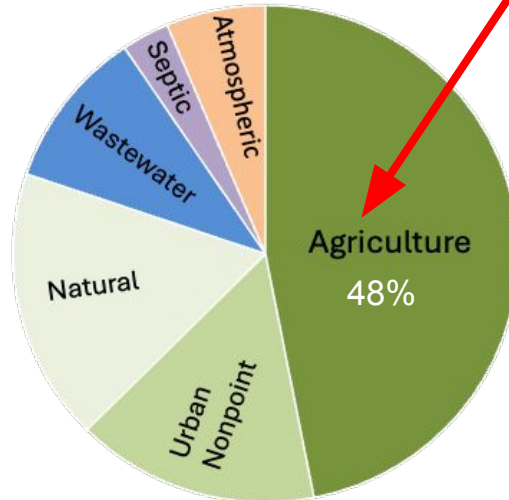
Agriculture is extensive across the CB watershed and accounts for a significant portion of nutrient loading

1/3 of the Chesapeake Bay's 64,000 mi² watershed is dedicated to farming.

- 83,000+ farms
- 50+ commodities

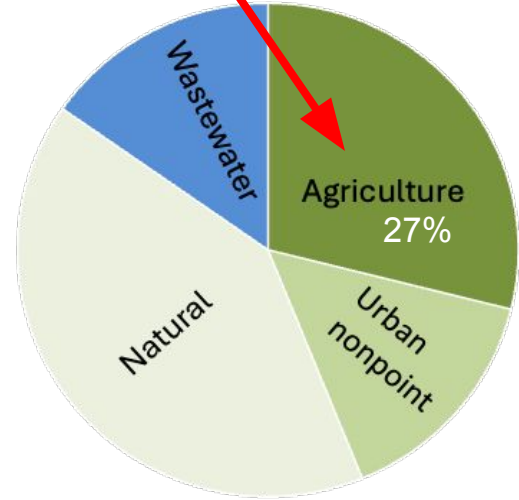
Primarily nonpoint source (NPS) pollution

Sources of nitrogen loads to Bay



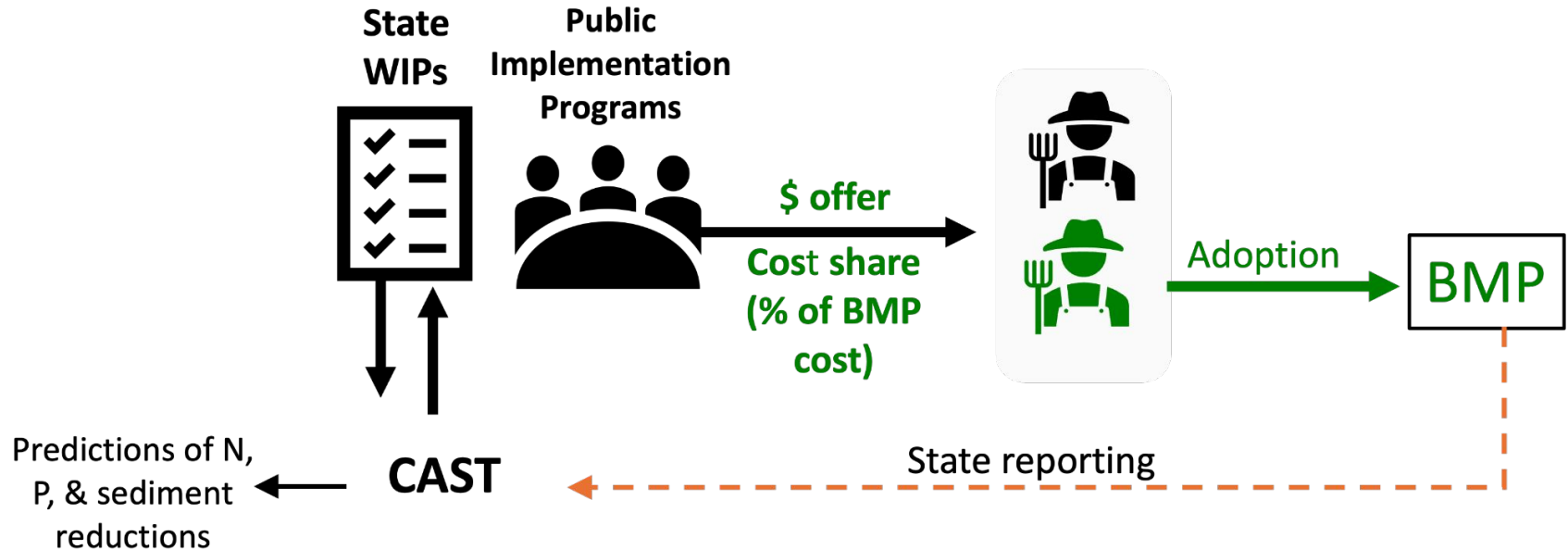
256 million lbs/yr of Nitrogen entering the Chesapeake Bay (estimated by CAST 23)
Goal: 210 mil lbs/yr

Sources of phosphorus loads to Bay

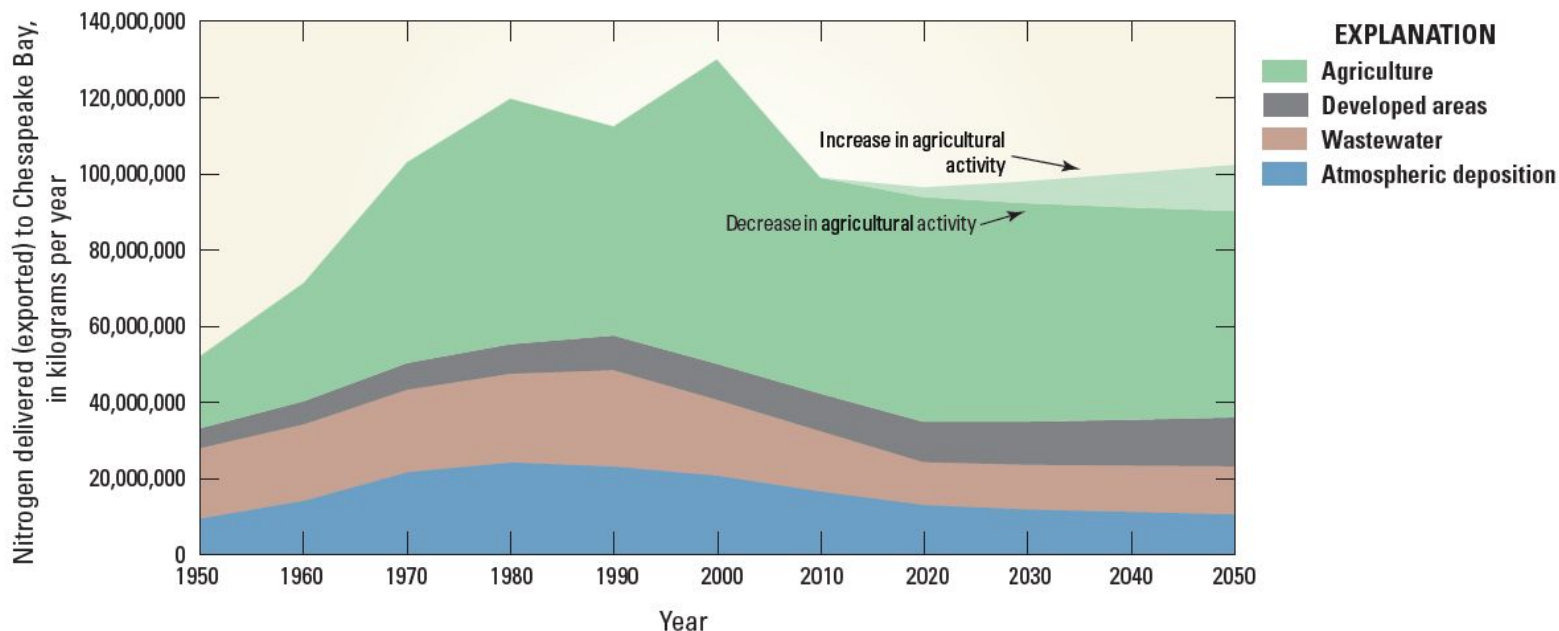


13.2million lbs/yr of phosphorus entering the Chesapeake Bay (estimated by CAST 23)
Goal: 12.7 mil lbs/yr

Traditional agricultural programs offer payments for voluntary best management practice (BMP) adoption



Despite progress, current programs are insufficient to meet TMDL targets (a similar story for nitrogen, phosphorus, and sediment)



Sources/Usage: Public Domain. [View Media Details](#)

Annual nitrogen loads exported to Chesapeake Bay by source, 1950-2050
(From Clune and Capel, 2021, figure OV.4; see Circular for more explanation)

Market-based approaches have the potential to spur innovation in meeting shared goals, but these programs have not been effectively scaled in the Chesapeake Bay restoration context.

- Market-based programs are being tested in the CBW
 - MD, PA, and VA have water quality programs that incentivize outcomes
 - Companies are creating incentives for BMP adoption within the supply chain
- We need to develop and test approaches that will effectively scale.

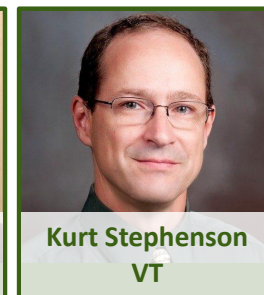
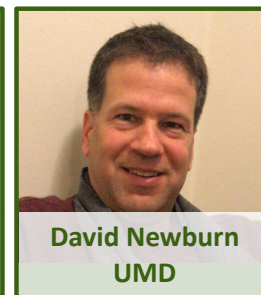
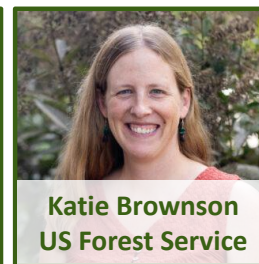
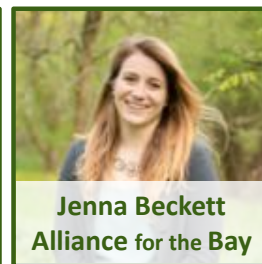
STAC Workshop Goal

To provide actionable guidance for advancing market-based approaches to achieve Chesapeake Bay goals.

- Working cooperatively across the private and public sectors to leverage market-based approaches that will accelerate the speed and scale of implementation of agricultural conservation practices.



Workshop Steering Committee



* STAC Member



The workshop focused on two approaches:

1. Pay-for-Performance (PfP)
 2. Corporate Supply Chain Initiatives (SCIs)
- Both approaches have strong potential and appear to have accelerated project delivery and produced cost savings.
 - The workshop explored how we can advance and scale these approaches to reach CB water quality goals.

Approach 1: Pay-for-performance (PfP) leverages market competition to encourage innovation, fund cost-effective practices, and focus on achieving outcome goals.

Examples – State-level programs with PfP features:

- MD DNR, Chesapeake & Atlantic Coastal Bays Trust Fund, Outcome 1 PFS Track
- PennVest, Clean Water Procurement Program
- VA DEQ, Pay-for-Outcomes NPS Pilot Program

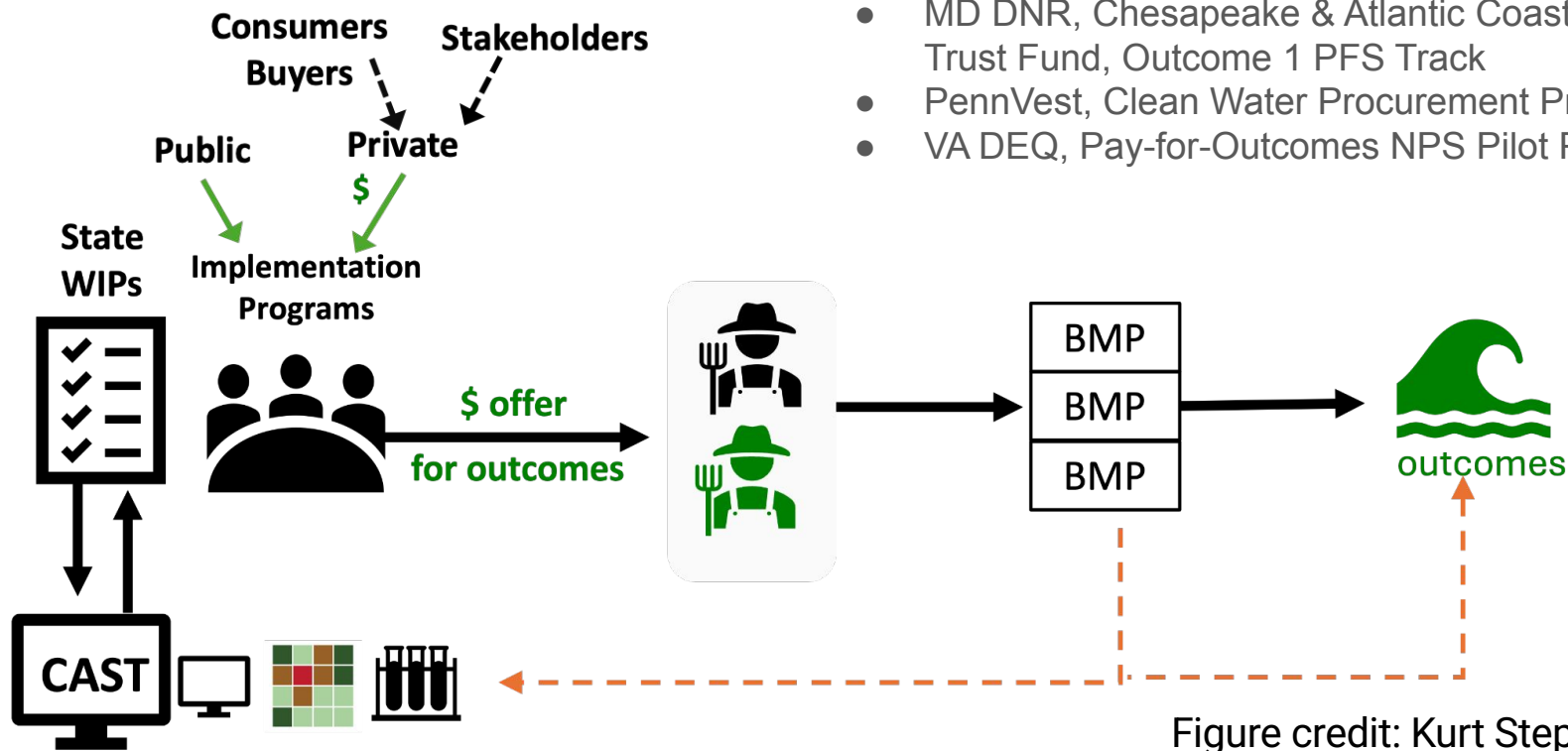
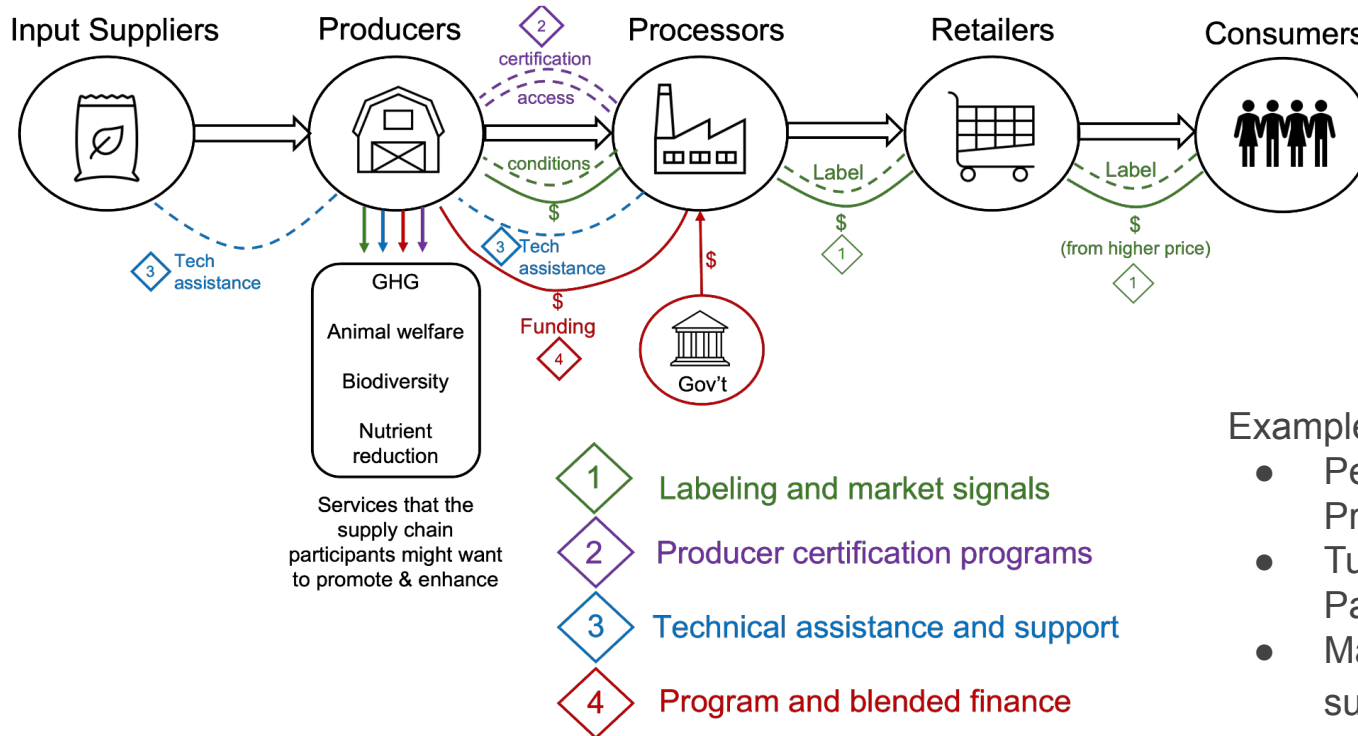


Figure credit: Kurt Stephenson

Approach 2: Supply chain initiatives (SCIs) are used to achieve corporate sustainability goals. Companies encourage suppliers to adopt BMPs, often working with nonprofits and relying on public funding for implementation.



Examples:

- Perdue Sustainability Program*
- Turkey Hill Clean Water Partnership*
- Maola Local Dairies sustainability programs**



**Molly Elgin
McWilliams**
J-Team Dairy, LLC

Experiences guided recommendations

A farmer's perspective: J-Team Dairy, Orange County, Virginia

Molly McWilliams worked with Maola's sustainability team to establish a riparian buffer.

"The dairy industry isn't overflowing with money," she said, "so when there's additional money we can put towards projects, it's a huge help."

The cooperative-to-farmer pathway can make conservation feel accessible rather than burdensome.

An environmental consultant's perspective: Weaver Environmental Consulting, Lancaster County, Pennsylvania

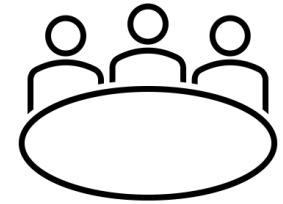
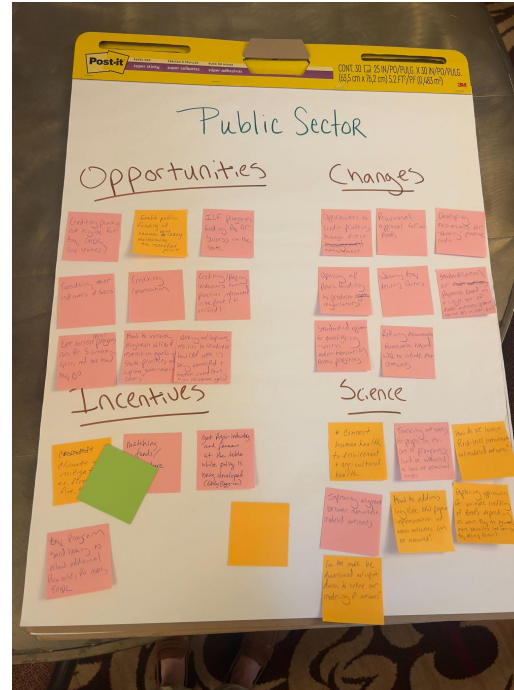
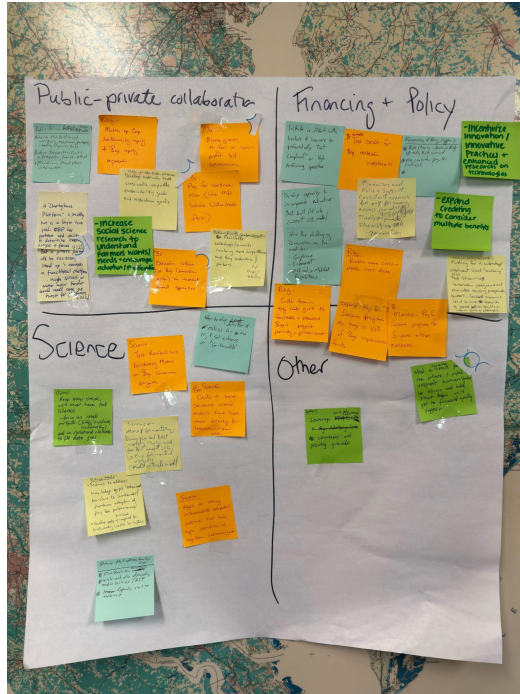
"There's just so, so much paperwork, and a lot of it is redundant. ... Is there a way that we can mainstream some of the process?"

"If we can [monitor and report] how these BMP projects are reducing nutrients and sediments, we can use that data to promote conservation and continue to see how conservation pays."



Jeremy Weaver
Weaver
Environmental
Consulting

Active workshop engagement led to key themes and recommendations



5 Key Themes from the Workshop

1. **Competing goals shape program design, participation, and outcomes:**
 - a. Potential tensions between Chesapeake Bay water quality objectives and broader conservation goals (e.g., SCIs focused on carbon, biodiversity, animal welfare).
 - b. Opinions differed on how much weight should be given to co-benefit goals that may reduce the cost-effectiveness of nutrient reductions.
 - c. Trade-offs often arise between conservation goals and agricultural profitability.

2. **Program design involves trade-offs between accuracy, cost, and innovation:**
 - a. Using *direct* outcome measurements, rather than modeled outcomes, would increase confidence in project performance and incentivize technological innovation.
 - b. Using direct outcome measures is costly and shifts performance risks to project implementers, which may impact participation.
 - c. Simplicity and manageable costs are key to program growth, as are improvements to performance-based measurement, monitoring, and reporting.



5 Key Themes from the Workshop (continued)

3. **Financial constraints limit scalability and impact:**

- a. PfP and SCI approaches face challenges in generating and sustaining sufficient funding, and both currently rely heavily on government funding.
- b. PfP programs are currently allocated a small percentage of Bay restoration funding.
- c. Participants were skeptical that either approach would generate new Bay-specific private funding.

4. **Transaction costs and administrative burdens are major barriers to participation:**

- a. Participation is limited by “transactional friction” such as burdensome paperwork, slow permitting and reimbursement processes, rigid program rules, and insufficient payments.
- b. These barriers reduce the overall efficiency and accessibility of conservation programs.
- c. Market-based approaches are intended to reduce some administrative burdens.



5 Key Themes from the Workshop (continued)

5. **Trust is foundational and key to scaling programs for Bay restoration:**

- a. Producers must trust their technical advisors, program implementers, and their supply chain partners to be willing to participate in market-based programs.
- b. Participants noted that trust, which is built through sustained and personal interactions, has been difficult to scale to the degree necessary for accelerating watershed restoration.
- c. Market-based approaches can use innovative incentives and implementation models that leverage trusted networks to expand program participation.



17 Recommendations, 4 Summarized Below

1. **Develop lower-cost measurement, monitoring, reporting, and verification (MMRV):** Reduce transaction costs by advancing efficient and scalable MMRV approaches (e.g., locally validated models, remote sensing, and innovative data sources) while maintaining credibility and rigor.
2. **Adaptively manage existing PfP programs:** Evaluate and learn from the existing PfP state programs, which have different rules, to compare effectiveness and to identify and advance the social and ecological science needed to optimize these programs.
3. **Take risks to drive innovation:** Different types of program experiments, and a safe regulatory space for conducting experiments (“sandboxing”), have the potential to generate new and effective approaches. Ex: agribusiness entities could manage a portion of cost-share funds to leverage their existing farmer relationships and technical knowledge.
4. **Work towards aligning public and private sector goals:** Repeated engagement across public and private partners is critical for goal alignment. Identify projects that align stakeholder incentives and attract private-sector interest and investment.



Where do we go from here?

Market-based mechanisms hold genuine potential for reducing agricultural pollution and achieving Chesapeake Bay goals. However, **realizing that potential will require:**

- Innovation (including lower-cost MMRV, financing, etc.)
- Adaptive management
- Sustained public and private funding
- Strategic cross-sector engagement and goal alignment
- Streamlined and complementary (not conflicting) programs
- Financing and policy support/alignment



Thank you!

What questions do you have?

Contact info:

Leah Palm-Forster, Workshop Co-Chair

University of Delaware

leahhp@udel.edu



Full Report



Palm-Forster, L., L. Wainger, Y. Kuwayama, K. Stephenson, D. A. Newburn, K. Brownson, M. Cole, J. Beckett, S. Knoche, and E. Campbell. 2026. Advancing Market-Based Approaches in the Agricultural Sector to Support Chesapeake Bay Watershed Restoration. STAC Publication Number 26-004, Edgewater, MD. 72 pp. [Download here](#)