

# How State Water Quality Program Design Can Drive Cost-Effectiveness

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*Environmental Policy Innovation Center*





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**Water**



# Overview of Chesapeake Programs

	Average Cost per lb N	Who is Buying	Priorities	Quantification Plan	Authorized in
Clean Water Commerce	\$20.85	Maryland Dept. of Environment	<ul style="list-style-type: none"> <li>Locally impaired watershed</li> <li>P and sediment reductions</li> <li>Alleviation of environmental injustice</li> <li>Climate mitigation and adaptation</li> </ul>	CAST	2021
Clean Water Procurement	\$15.57	Pennvest	<ul style="list-style-type: none"> <li>Locally impaired watershed</li> <li>Tier 1 Chesapeake Bay county</li> <li>“Small farms”=not CAFOs</li> <li>Community/environmental benefits</li> <li>Fiscal/managerial viability of entity</li> </ul>	Chesapeake Bay Nutrient Trading Tool	2022
Conowingo Pay for Success	\$30.79	Maryland Dept. of Environment via Susquehanna River Basin Commission	<ul style="list-style-type: none"> <li>Located in Maryland</li> <li>Dredging</li> <li>Most effective basin</li> </ul>	CAST	2023
Pay for Outcomes	\$32.73/ \$18.91	Virginia Dept. of Environmental Quality	<ul style="list-style-type: none"> <li>Success confidence</li> <li>Habitat and resilience benefits</li> <li>Readiness to proceed</li> <li>Local government coordination</li> </ul>	CAST, but encouraged direct measurement as well	2024

\* MD DNR Chesapeake and Atlantic Coastal Bays Trust Fund not included

***What drives cost differences across Chesapeake Pay for Success programs?***

# Chesapeake Pay for Success is a Success

How state water quality program design can drive cost-effectiveness



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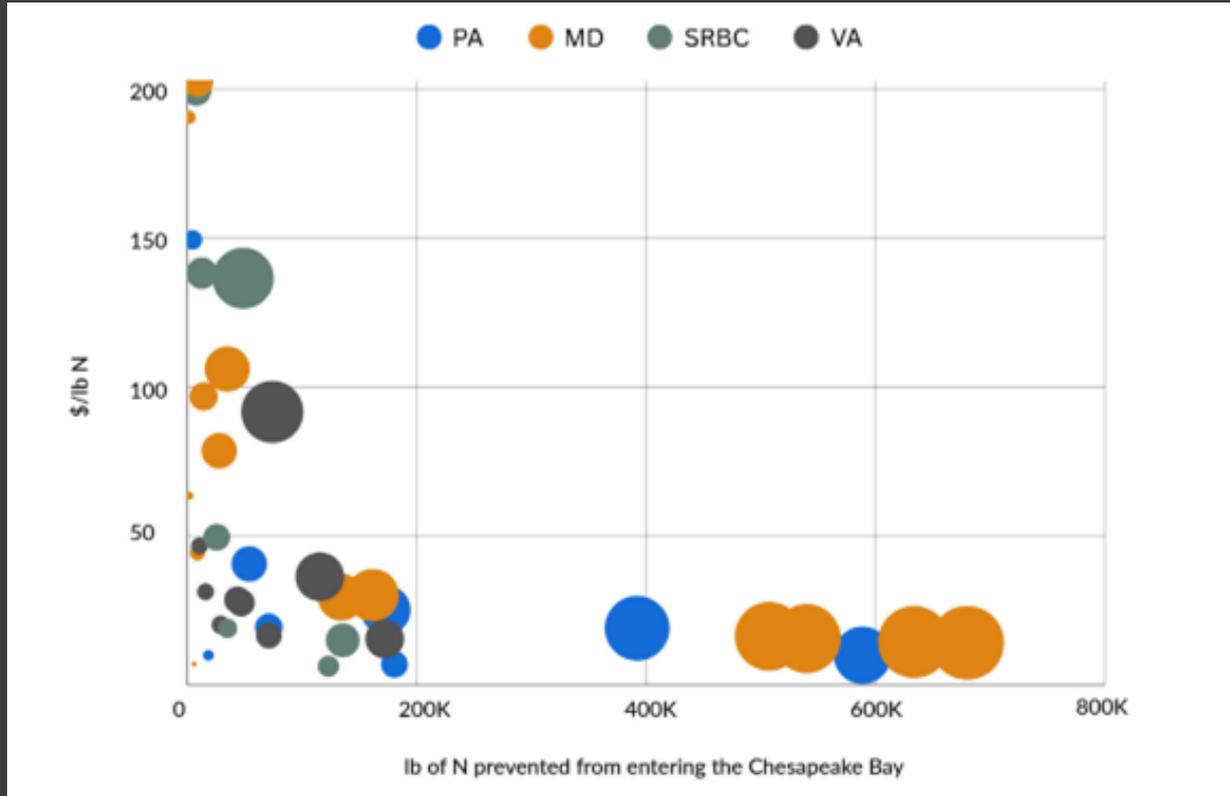
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# Overview of Chesapeake Programs

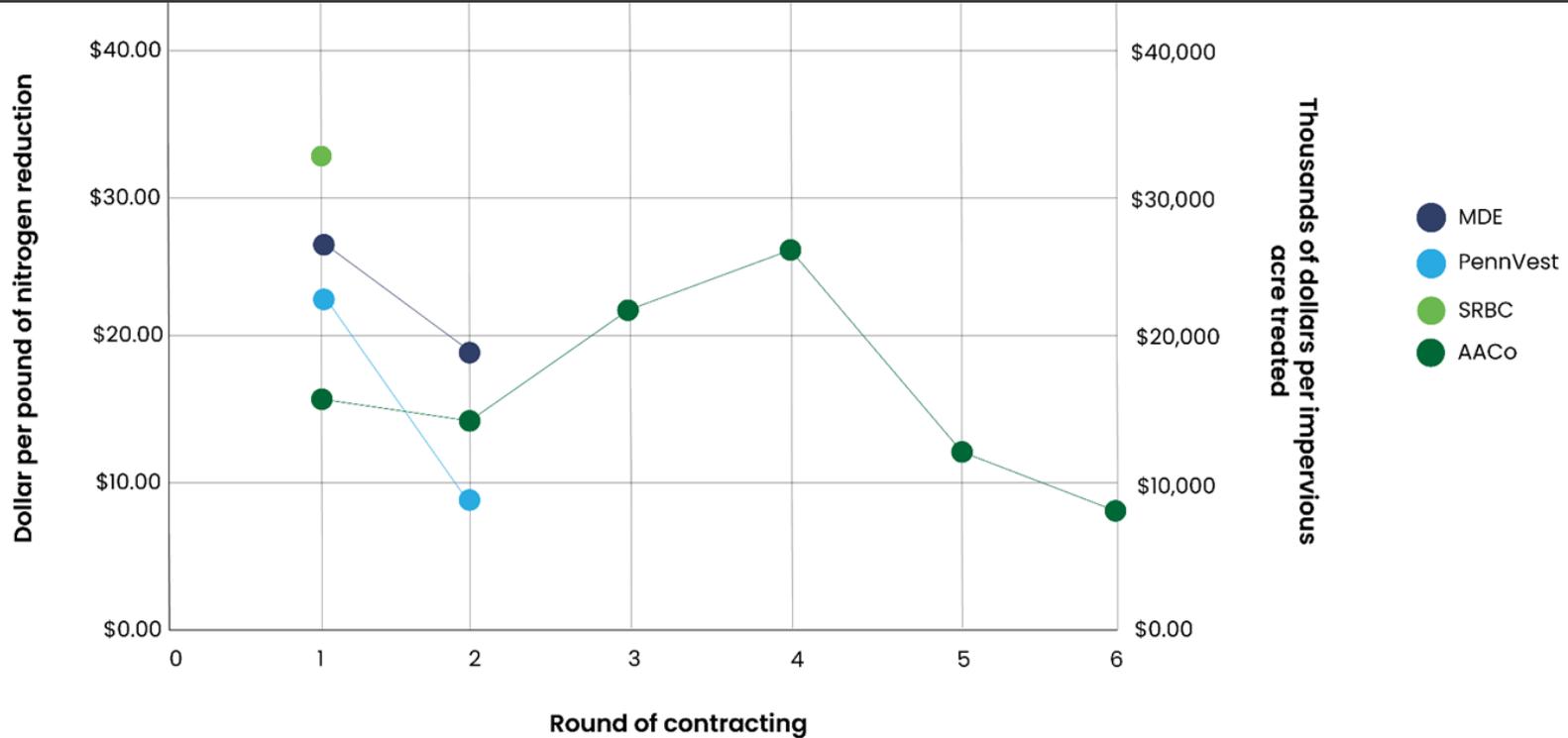
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# Cost-effectiveness of nitrogen reductions



# The longer PFS programs go, the lower the cost



# Quantification methods impact prices

- Differences in the underlying model may provide different amounts of credit for different practices
- Direct measurement is more costly than modelling
- Is it easy to use?

# Some practice types are more expensive

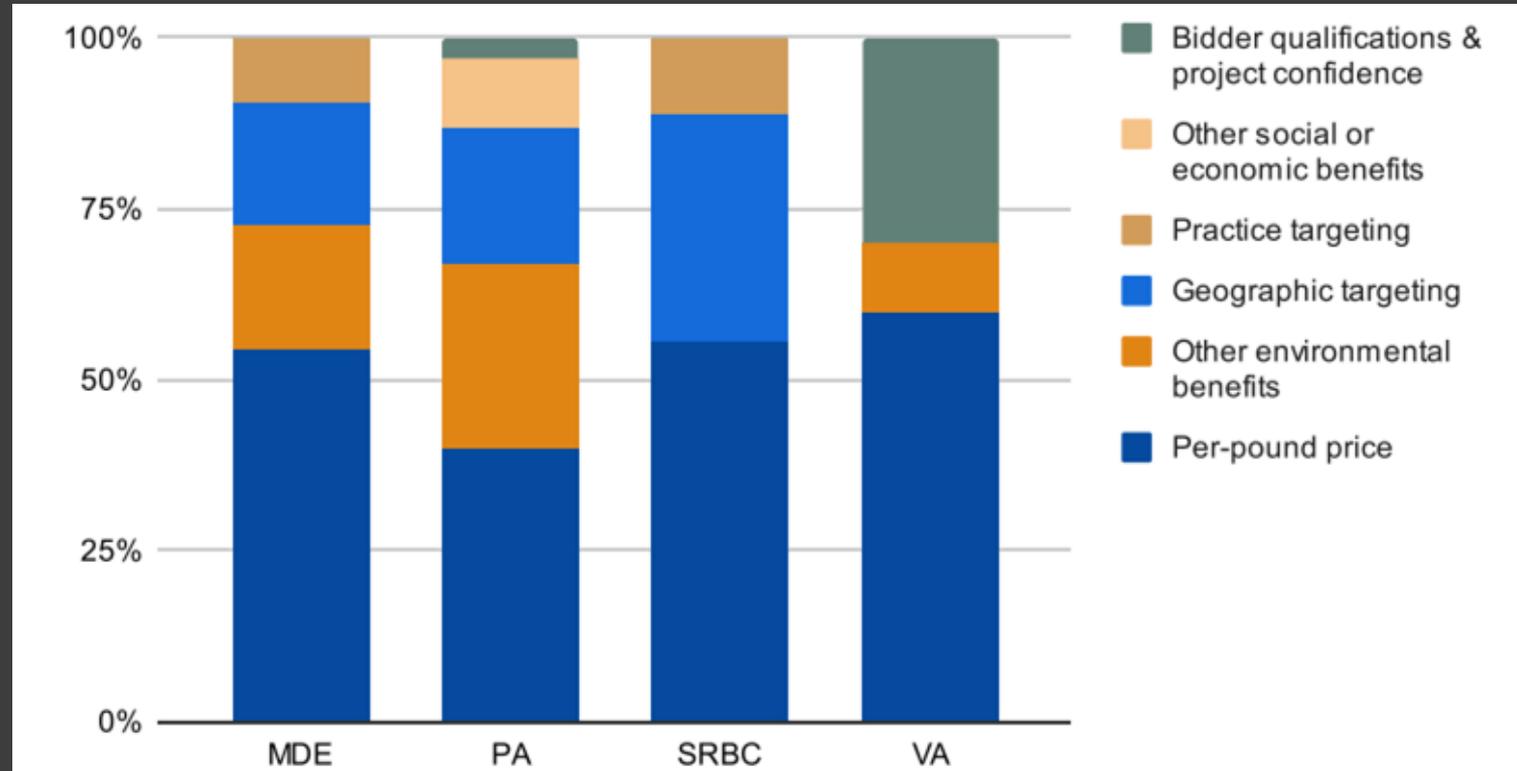


Credit: Maryland Department of Agriculture



Credit: Lynn Betts/Wikipedia

# Priority point distribution by program



# When the money goes out the door matters



## Summary of Pay for Success Payment Schedule Examples

	% paid by post-construction	% held for verified delivery of outcomes	Outcome purchased	Est. time to final payment
<b>Ex) 1 The Frontloaders</b>	~ 80% Individual projects vary	~20% Individual projects vary	Stormwater Credits	8 years
<b>Ex) 2 The Many Milestones</b>	~60%	~40%	Habitat Credits	Est. 5 years
<b>Ex) 3 The Holdouts</b>	0%	100%	Lbs. of Nitrogen	The lifetime of BMP (up to 20 years)
<b>Control) Grants</b>	100% paid upon agreement execution (pre-construction)	0%	n/a	0 years - paid upon agreement execution

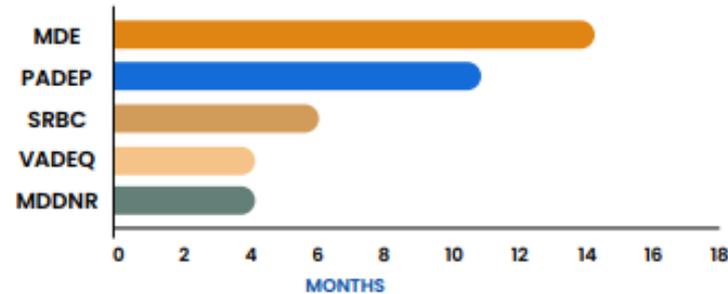


## A BALANCING ACT

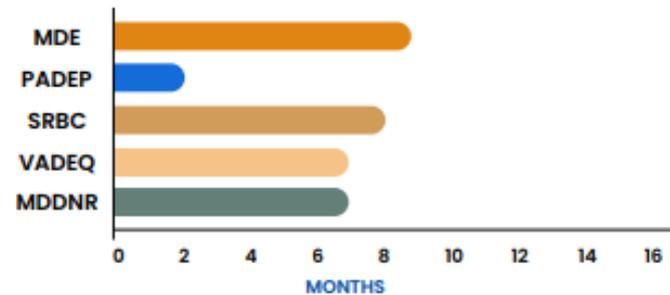
**Optimizing Payment Schedules in Environmental  
Pay for Success Contracts**

# Administrative barriers and slowness

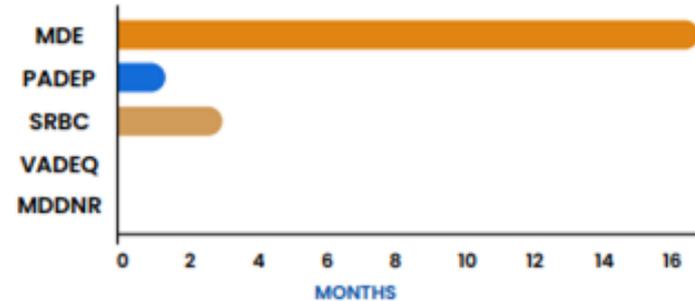
### MONTHS FROM PASSAGE TO RFP RELEASE



### MONTHS FROM RFP CLOSE TO SELECTION



### MONTHS FROM SELECTION TO LAST SIGNATURE



TOTAL MONTHS  
EXCLUDING RFP  
OPEN

MDE

40  
MONTHS

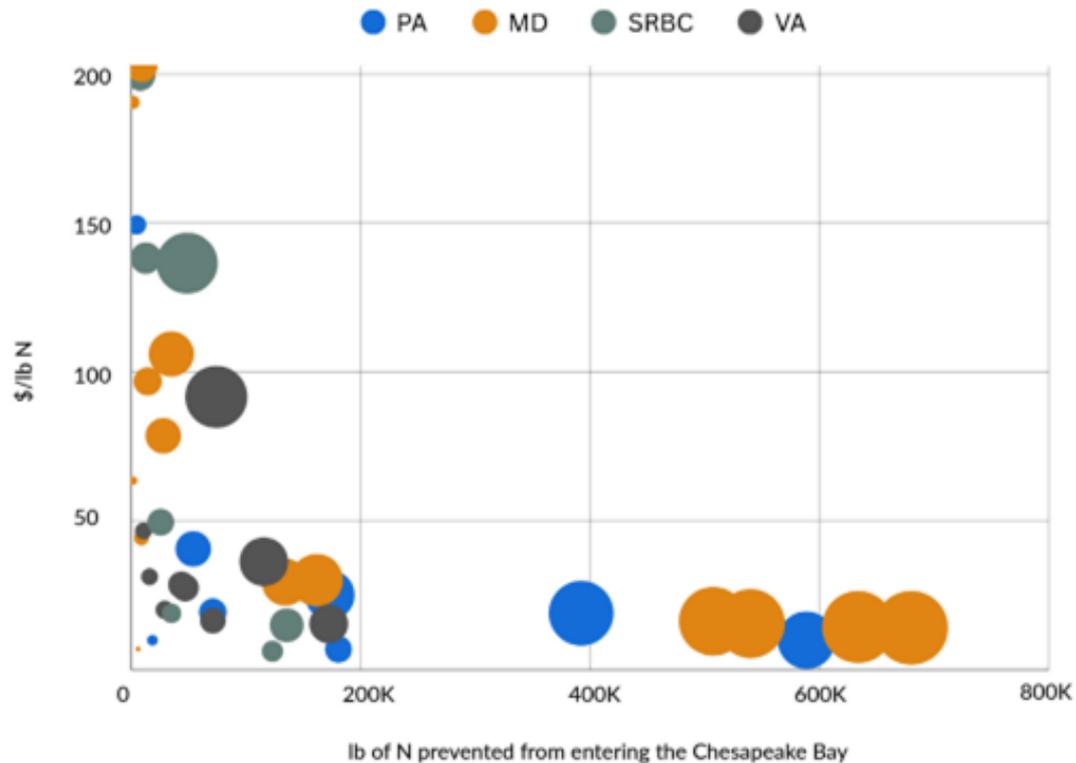
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PADEP

14  
MONTHS

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SRBC

17  
MONTHS

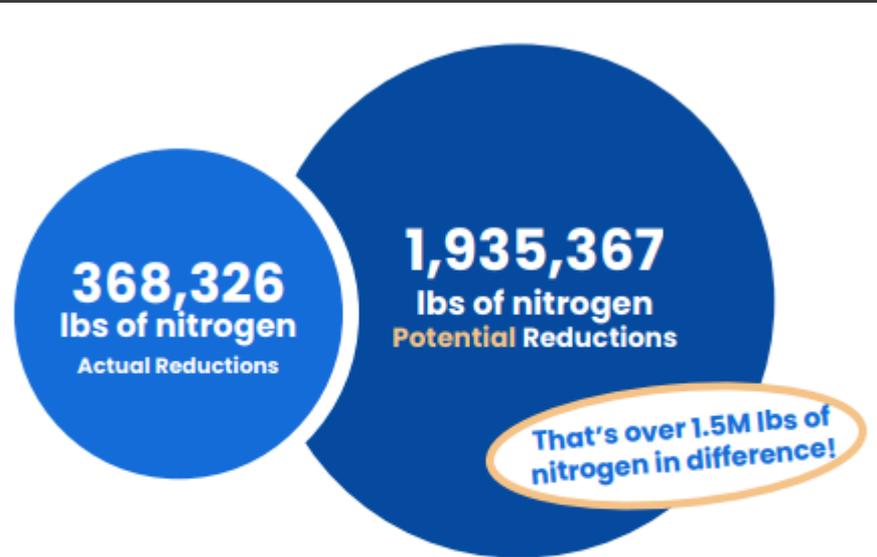
# Back to price



# High price variation → great potential

PADEP	<b>\$21,983,367.75</b> TOTAL SPEND	<b>\$15.57</b> AVERAGE PRICE <b>\$6.91</b> LOWEST PRICE	<b>1,412,005</b> lbs of nitrogen ACTUAL REDUCTIONS <b>3,181,385</b> lbs of nitrogen POTENTIAL REDUCTIONS
MDE	<b>\$59,600,000.88</b> TOTAL SPEND	<b>\$20.87</b> AVERAGE PRICE <b>\$7.00</b> LOWEST PRICE	<b>2,856,087</b> lbs of nitrogen ACTUAL REDUCTIONS <b>8,514,286</b> lbs of nitrogen POTENTIAL REDUCTIONS
VADEQ	<b>\$18,978,300.00</b> TOTAL SPEND	<b>\$32.72</b> AVERAGE PRICE <b>\$15.45</b> LOWEST PRICE	<b>580,000</b> lbs of nitrogen ACTUAL REDUCTIONS <b>1,228,369</b> lbs of nitrogen POTENTIAL REDUCTIONS
SRBC	<b>\$11,341,250.94</b> TOTAL SPEND	<b>\$30.79</b> AVERAGE PRICE <b>\$5.86</b> LOWEST PRICE	<b>368,326</b> lbs of nitrogen ACTUAL REDUCTIONS <b>1,935,367</b> lbs of nitrogen POTENTIAL REDUCTIONS

# How do we get more of the lowest cost outcomes?



**Figure 1: Visualization of Price Difference**

*This graphic shows the difference between the reductions actually purchased by the SRBC program and the reductions the program could have purchased with the same funds if all projects were at the cost of the project with the lowest price per pound*

# Recommendations

- Continue funding these programs. They're working, and we can further optimize their design.
- Minimize co-benefits in proposal scoring criteria, ensuring a minimum of 60% of points are attributed to the per-pound price.
- Use milestone payments to create payment schedules that balance the cost of capital and risk.
- Score proposals and award contracts quickly as possible.
- Coordinate programs to continue to learn from one another, creating consistent signaling to the bidder community.
- Improve outreach and communication efforts to widen the bidder pool.

## Additional research questions

- To what extent is it possible to project expected prices based on the factors identified as driving costs?
- What types of applicants (e.g., small vs. large organizations, rural vs. urban) are being funded? How is that impacted by program design?
- Is there an optimal proposal scoring mechanism for cost-effectiveness points? (e.g., the Maryland approach of quintiles vs the Pennsylvania approach of fewer points to each more expensive project)
- How much does additional outreach drive cost decreases by increasing the bidder pool? How does it change the composition of the applicant pool?

# Questions?

Reach out to:

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