

Collaborative Activities on Blue Carbon in Maryland

Webinar #2:

Environmental Finance Mechanisms for Enhancing Maryland's Blue Carbon Sinks

January 20, 2022

This webinar and the panel discussion explored current and future environmental finance mechanism opportunities that can protect and enhance Maryland's blue carbon ecosystems. The webinar looked at opportunities to scale the impact of ongoing restoration efforts as well as topics related to co-benefits tracking and stacking, creating an enabling regulatory environment, and attracting private investment and innovative finance to accelerate coastal resilience and carbon sequestration.



Agenda

- | | | |
|--------------------|--|---|
| Welcome | | Secretary Ben Grumbles, <i>Maryland Department of the Environment</i> |
| State Perspectives | | Dr. Rachel Lamb, <i>Maryland Department of the Environment</i> |
| Presentations | | "Environmental Policy Innovation Center" - Tim Male, <i>EPIC</i> |
| | | "Blue Carbon Financing" - Dan Nees, <i>Center for Global Sustainability University of Maryland</i> |
| | | "Creating Financial Incentives for Blue Carbon & Multi-Benefit Projects" - Dr. Lisa Wainger, <i>University of Maryland Center for Environmental Science</i> |
| Panel Discussion | | How to Capitalize on Opportunities. |

[Recording of the Webinar](#)

Summary

Key Points

- Robust discussion from experts on how to scale impact using the voluntary carbon market, co-benefit crediting and trading, and by considering carbon financing as part of a larger portfolio of diverse revenue streams.
- "Funding" - one-way financial resources to support a need, program or project. "Financing" - two-way acquisition of money for a program or project.
- Different credit types:
 - Bundling: credits generated by a single action and sold as a package
 - Unbundling: credits generated by a single action and sold separately
 - Stacking: credits generated by an "additional" activity
- Role of blue carbon financing within infrastructure financing systems, where carbon markets are a part of the broader financing system. Some elements of the system include: diverse community needs; diverse, sustainable and sufficient revenue streams and markets; institutional capacity and flexibility; project portfolios that encompass a broader infrastructure system and efficiency through cash flow management.
- Emphasized importance of cash flow management across project lifespans, where an entity can see the range of financing levers available to them and consider how they can be used together or over time to make projects most cost-effective and maximize impacts for the State's climate and environmental goals.
- Emphasized the supportive role of government in reducing transaction costs and creating a financial incentive for co-benefits.
- Maryland's participation in the Regional Greenhouse Gas Initiative (RGGI) underscores the growth towards valuing carbon in the compliance market, not just the voluntary one.

Environmental Finance Mechanisms for Enhancing Maryland's Blue Carbon

January 20, 2022

| 1:00pm – 3:00pm

Speaker Bios

Dr. Rachel Lamb



Dr. Rachel Lamb is a Maryland Sea Grant State Science Policy Fellow in the Maryland Department of Environment's Climate Change Program. Rachel supports carbon assessments and accounting for Maryland's natural and working lands. She also works to advance supportive policy for strategic carbon sequestration activities relative to the state's Greenhouse Gas Reduction Act and broader participation in the Regional Greenhouse Gas Initiative (RGGI). Rachel earned her PhD in Geographical Sciences at the University of Maryland College Park (UMD) where her research centered on the applications of NASA Carbon Monitoring System science to advance strategic reforestation with co-benefits for biodiversity and human livelihoods.

Suzanne Dorsey



Suzanne Dorsey is the Assistant Secretary for the Maryland Department of the Environment. She was previously the Executive Director of the Harry R. Hughes Center for Agro-Ecology. In her current role she works with state and federal partners, the business community, citizens, NGOs and industry representatives to fulfill the mission of MDE with consistent application of laws and regulations while solving environmental and human health challenges.

Tim Male



Tim founded the Environmental Policy Innovation Center in 2017. Prior to launching this startup, he served as an Associate Director at the White House Council on Environmental Quality, Vice President for Conservation Policy at Defenders of Wildlife, Director at National Fish and Wildlife Foundation, and Co-Director of agriculture policy at Environmental Defense Fund. He holds degrees in science from Yale University and the University of Hawaii. His writing has appeared in the Wall Street Journal, Washington Post, Science magazine and a diversity of peer-reviewed journals. He has received a Marshall Memorial Fellowship and AAAS Science and Technology Policy Fellowship (declined). He also ran for office and won, serving three terms as a city councilmember and leading the successful effort for that city to become the first in the country to lower its voting age to 16.

Dan Nees



Dan Nees is a senior research associate with the Center for Global Sustainability (CGS) at the School of Public Policy. Prior to his tenure at CGS, Dan was the director of the University of Maryland's Environmental Finance Center. For the past 20 years Dan has assisted communities throughout the Mid-Atlantic region in their efforts to finance environmental and sustainable development initiatives. His work currently focuses on developing innovative market and performance-based financing systems to reduce the cost of climate change and environmental mitigation, adaptation, and resilience at local, state, and regional levels. In addition to his work at the University of Maryland, Dan led environmental market and water quality programs at Forest Trends, a global NGO that seeks to develop market and economic solutions to global environmental problems, and at the World Resources Institute (WRI), an environmental think-tank. Dan earned a B.A. in Economics, a Master of Environmental Policy, and a Master of Business Administration, all from the University of Maryland College Park.

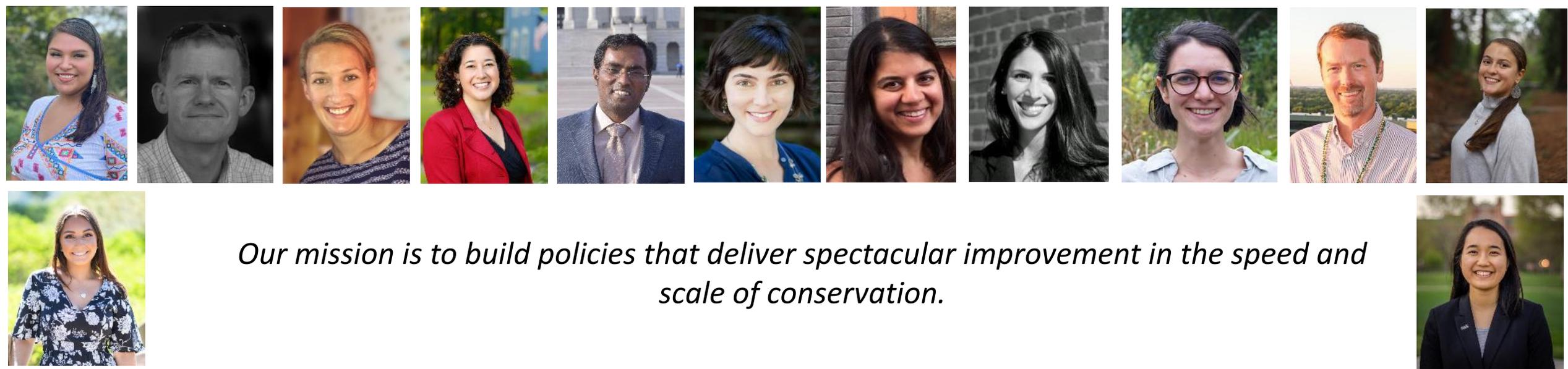
Dr. Lisa Waigner



Dr. Waigner is a research professor of environmental economics at the University of Maryland Center for Environmental Science. She has over 20 years of experience in evaluating the costs, benefits and risks of environmental restoration and management. Her work with government agencies includes designing economic incentives that promote environmental benefits and business opportunities. She is known for work developing economically-based non-monetary benefit indicators to improve the representation of benefits and tradeoffs in natural resource policy. She has published widely on water quality, invasive species management, ecosystem service valuation, aquaculture, and recreational fishing. She serves on numerous science advisory boards and is currently co-chair of the Ecosystem Science and Management Working Group that serves the National Oceanic and Atmospheric Administration's Science Advisory Board to the Administrator. She is also chair-elect of the California Delta Independent Science Board and past chair of the Scientific and Technical Advisory Committee to the US EPA Chesapeake Bay Program.



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\$4.8 billion annual market for stream and wetland protection and restoration

Figure 1. Demand for voluntarily carbon credits (MtCO₂e)

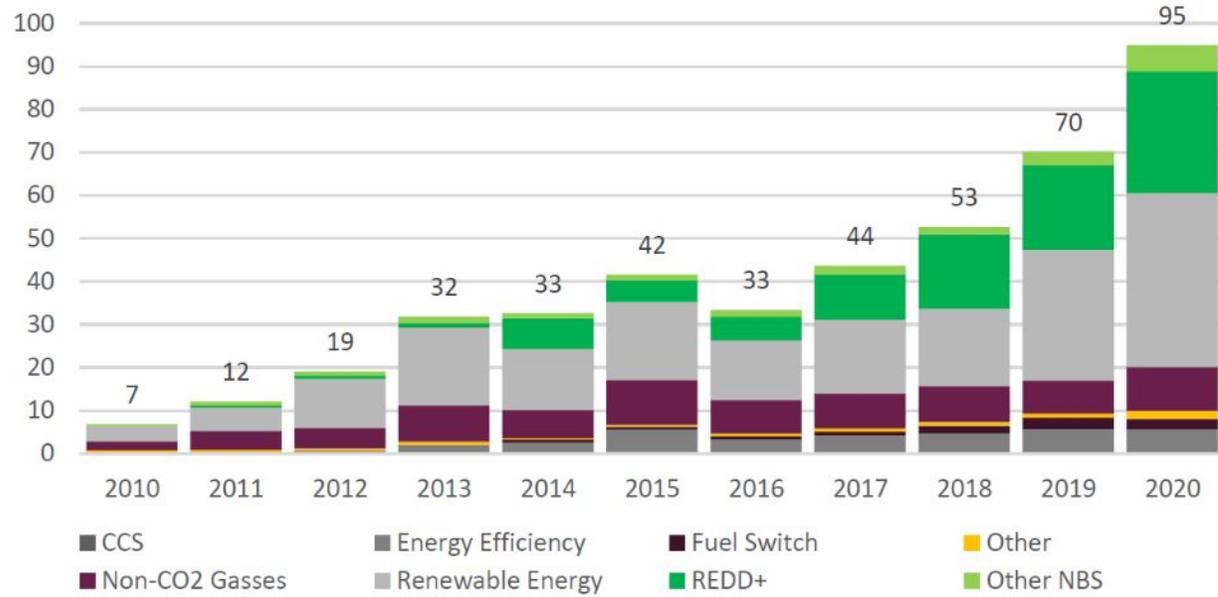
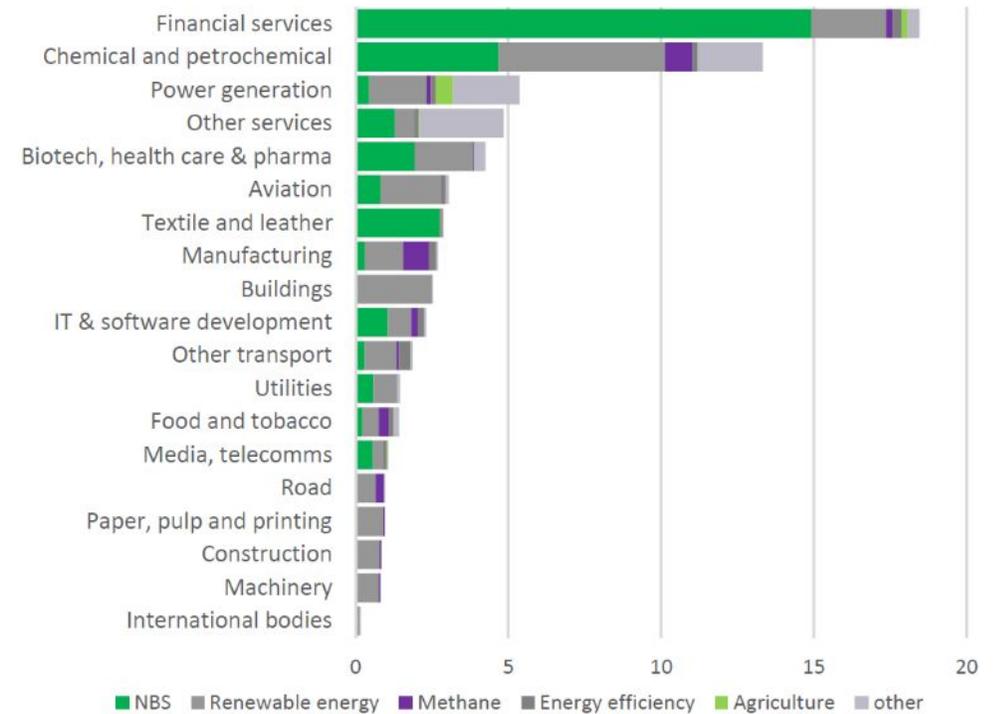


Figure 2. Demand for voluntarily carbon credits by sector 2019 (MtCO₂e) (total volume 70MtCO₂e)





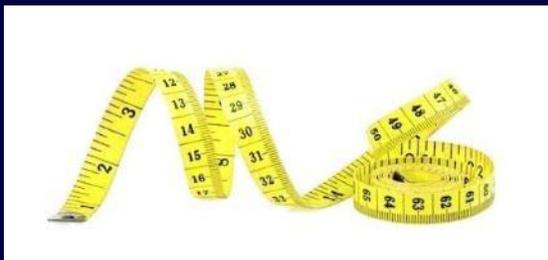
Natural commodity has value to someone – or gains value



Government behavior – either as a regulator or a buyer – needs to be predictable



Someone must pay back the investor (inc. state)



Agreed upon currency that requires less than 5-10% of investment to track

"funding" vs "financing"

Funding: Providing “one-way” financial resources to support a need, program, or project. This term is used when 1) the entity fills the need for funds by generating its own internal revenues and reserves. The use of taxes, sales revenues, rate revenues, cash reserves, and fees is referred to as “pay as you go” or “Pay Go” funding, and 2) the recipient obtains a grant or similar form of funds that do not require repayment and do not carry an interest expense.

Financing: The “two-way” acquisition of money for a program or project. The term financing is used when the monetary resource need is filled from borrowed money where principal and interest are owed to the source of funds. This includes loans, municipal bonds, and other sources of monetary resources that require repayment of principal and interest. These resources usually tie to a capital improvement and will not be available for supporting ongoing operational expenses.

MARYLAND CONSERVATION FINANCE ACT OF 2022

(1) “BLUE INFRASTRUCTURE” MEANS A WATER-BASED NATURAL AREA OR NATURAL FEATURE, OR A SYSTEM OR FEATURE DESIGNED TO PROTECT, MIMIC, OR ENHANCE A NATURAL FUNCTION, THAT:

- (I) ABSORBS AND FILTERS POLLUTANTS;
- (II) ATTENUATES SHORELINE EROSION;
- (III) PROTECTS COMMUNITIES FROM FLOODING OR STORM SURGE;
- (IV) REDUCES EROSION; OR
- (V) SEQUESTERS CARBON.

(2) “BLUE INFRASTRUCTURE” INCLUDES:

- (I) ENHANCED OR RESTORED OYSTER REEFS;
- (II) ENHANCED OR RESTORED SEAGRASS BEDS;
- (III) SHELLFISH AQUACULTURE PROJECTS;
- (IV) FLOATING WETLANDS; AND
- (V) RESTORED FRESHWATER MUSSEL POPULATIONS.

- Authorizes five state agencies to purchase environmental outcomes (including quantified carbon benefits)
- Water Quality Revolving Loan Fund: add “to support long-term or permanent ... blue infrastructure projects” and make a) disadvantaged communities, b) green and blue infrastructure into priorities for the annual funding process
- Authorizes the Secretary of DNR to purchase ‘environmental outcomes’ that from cost-effective long-term blue infrastructure projects in the Susquehanna River watershed
- Under DOT public-private partnership code, defines ‘public infrastructure asset’ (e.g. roads) to also include blue infrastructure
- Creates a green/blue infrastructure commission to identify ways to accelerate the implementation of carbon sequestration, aquatic habitat, wetland, and shellfish projects and to attract private financing to them.
- Requires DNR to begin implementing at least one marine/estuarine carbon offset project by July 1, 2024

Blue Carbon Financing

Dan Nees, Senior Fellow
Center for Global Sustainability
University of Maryland



Blue Carbon Financing

Focus on ***infrastructure*** financing systems:

- Diverse community ***needs***
- Diverse, sustainable, and sufficient ***revenue*** streams and markets
- ***Institutional*** capacity and flexibility
- ***Project portfolios*** that encompass a broader infrastructure system
- Efficiency through ***cash flow*** management



Claiborne Pell Newport Bridge Realignment

- Improve mobility and relieve traffic congestion
- Create multimodal transportation options
- Improve safety
- Economic development
- Green infrastructure, enhanced stormwater management
- Climate resilience





Tidal and Aquatic Ecosystems

Project portfolio:

- Water quality restoration
- Flood abatement
- Climate resilience
- Habitat conservation
- **Carbon sequestration**



Tidal and Aquatic Ecosystems

Diverse revenues:

- Multiple state, federal, and local (perhaps) revenues
- Private and philanthropic
- **Carbon markets**

Institutional capacity:

- The greatest need and the greatest opportunity



Tidal and Aquatic Ecosystems

Cash flow management:

- Public water quality restoration funding
- Infrastructure mitigation
- Flood abatement and resilience
- Water quality markets
- [Carbon markets](#)



Blue Carbon Financing

- Carbon markets will be an important part of a broader financing system
- We need demand and revenue flows linked to a diverse project portfolio

Blue Carbon Financing

Questions and Discussion

Creating financial incentives for blue carbon & multi-benefit projects

Lisa Wainger

UMCES-CBL

MDE Blue Carbon Financing Workshop

1/20/2022



What motivates [carbon] credit buyers?

Two markets

Compliance

- Costs
- Credit certainty
- Verification / registration costs high

Voluntary

- Costs
- Charisma
- Verification / registration costs modest (depends)



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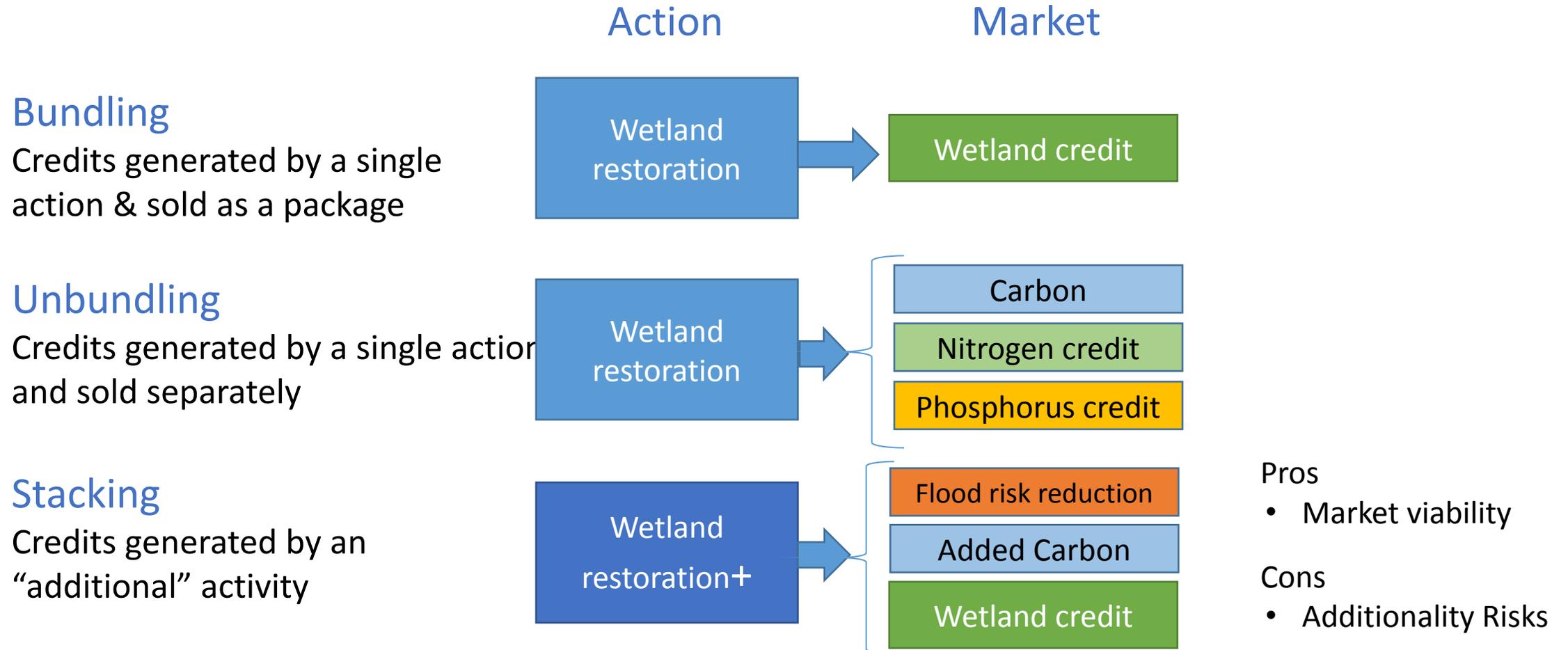
USDA Official Promotes Federal Purchases of Carbon Credits

- Says carbon markets should remain private, not government-run
- Climate adviser Bonnie discusses options as USDA prepares plan

By [Mike Dorning](#)
March 23, 2021, 2:54 PM EDT

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Credit types explained



What is additionality risk?

1. No new benefits
 - Pay for something that would have been done anyway
 - Leakage - offsetting harm at other sites
2. Net loss of benefits
 - Leakage when the credits are compensating for a loss

Additionality risk can be locally managed through program design & credit rules

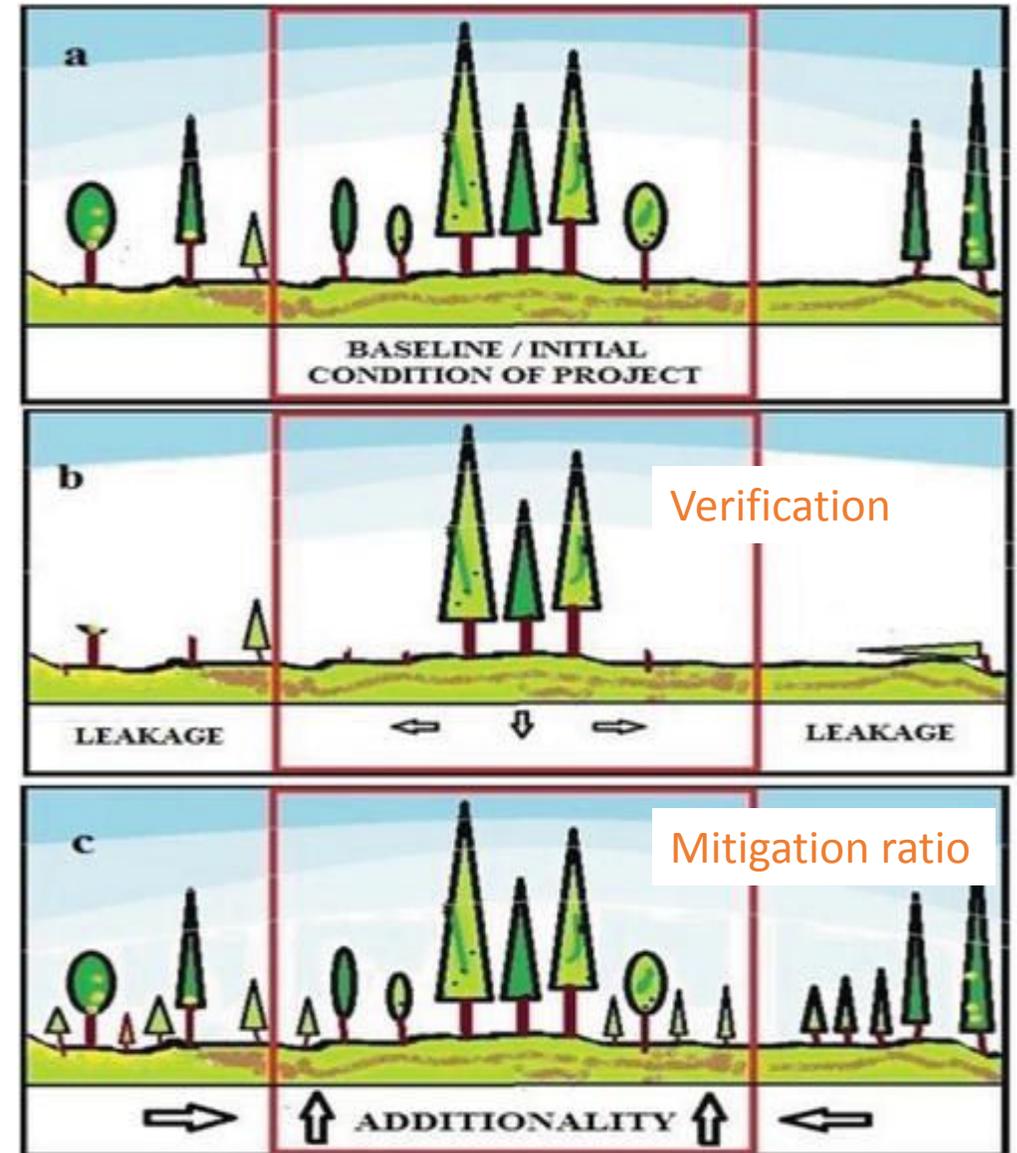


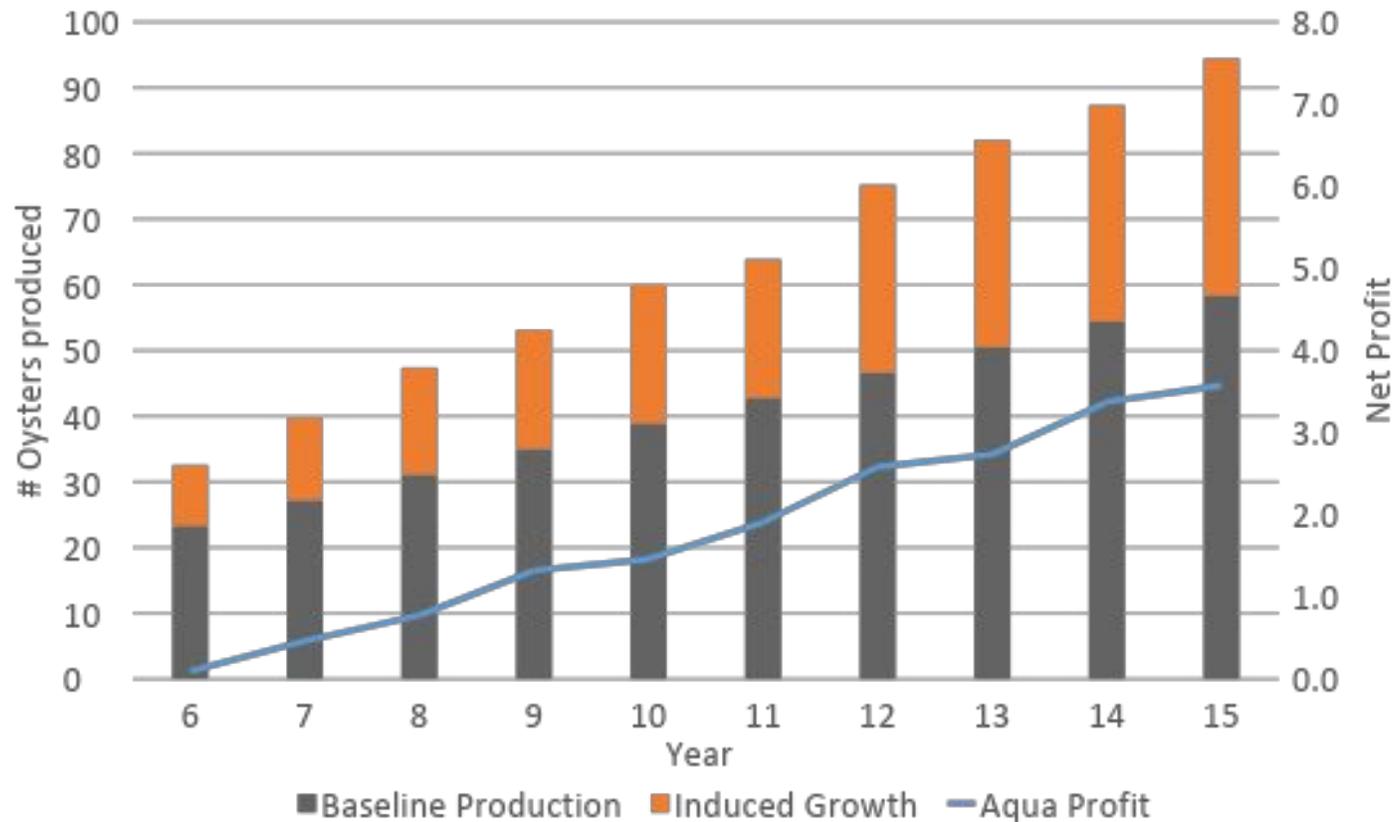
Figure from Mardiatmoko 2018

Additionality of water quality credits in the aquaculture industry

- Aquaculture producers are currently eligible to sell nitrogen (N) and phosphorus (P) credits based on the nutrients sequestered in oyster tissue

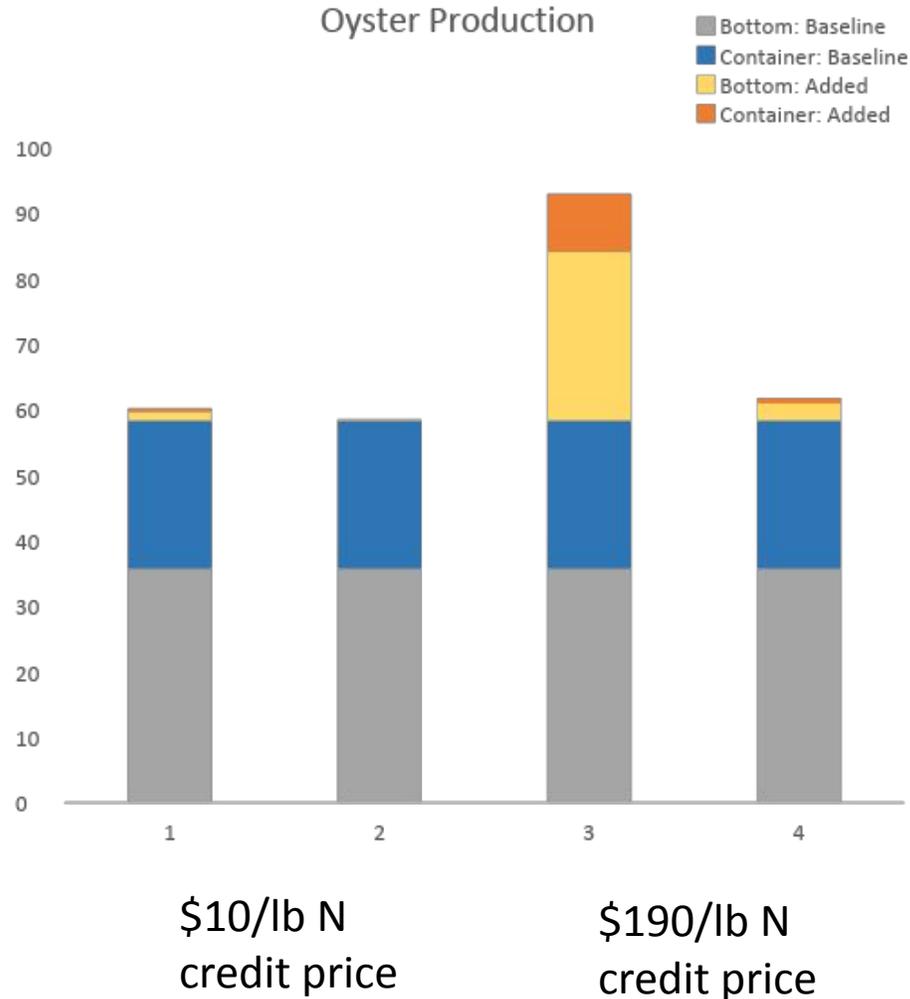


Water quality credits have the potential to accelerate aquaculture industry growth



- Additionality comes from this induced growth
- Co-benefits produced are more oysters removing N, heritage, habitat

Amount of induced aquaculture growth depends on program rules and credit prices



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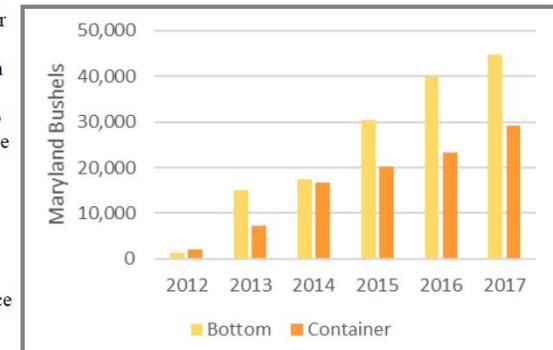
extension.umd.edu

FS 1103 | November 2019

Nutrient Credit Trading Could Expand Maryland Oyster Aquaculture

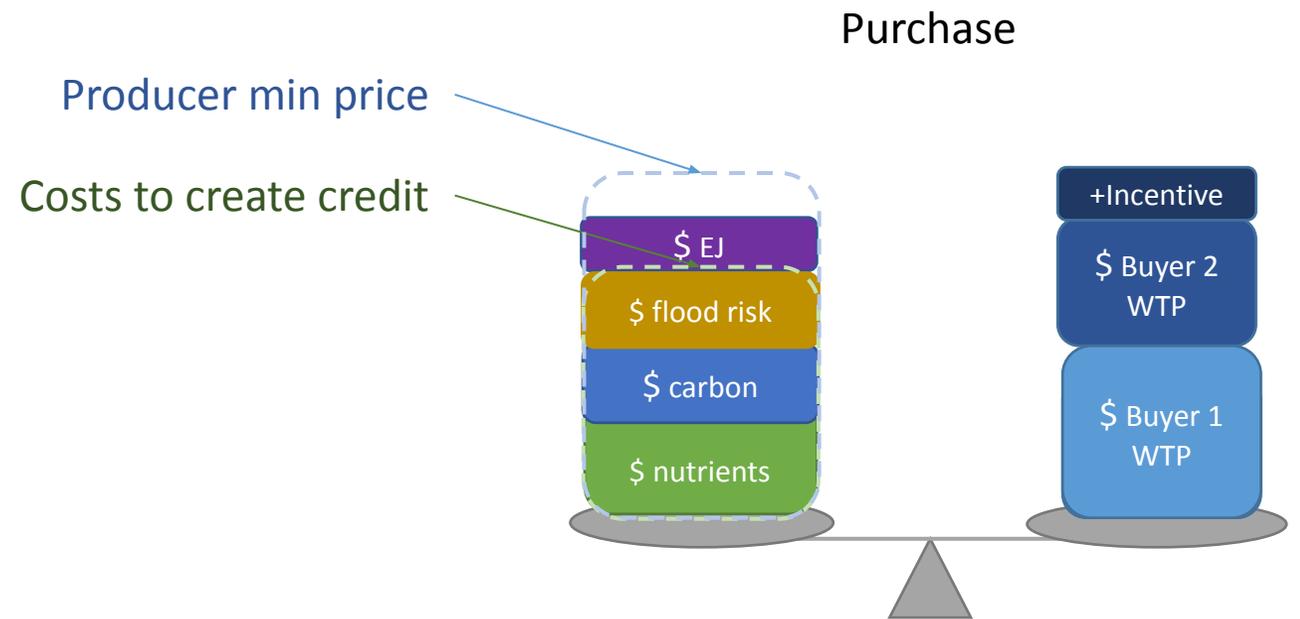
Researchers from the University of Maryland Center for Environmental Science (UMCES) conducted a study to evaluate the potential effect of nutrient credit trading on the growth and profitability of Maryland's aquaculture industry. Nutrient credit trading is a market approach to covering the cost of meeting the pollution caps that have been established to restore aquatic habitat in the Chesapeake Bay. Oyster aquaculture producers are eligible to sell credits in this emerging market, which creates the potential for economic and environmental benefits.

Oyster aquaculture in Maryland has grown steadily since the process for obtaining aquaculture leases was streamlined in 2010 (Figure 1). Maryland oyster



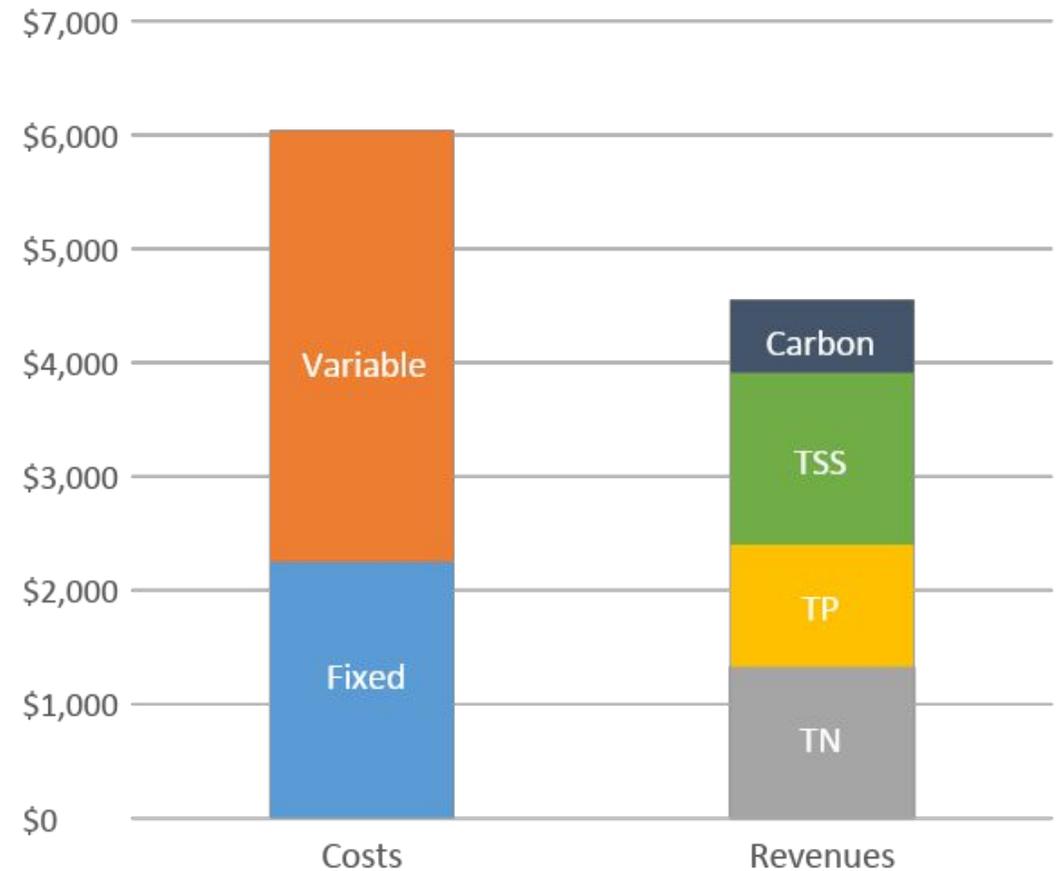
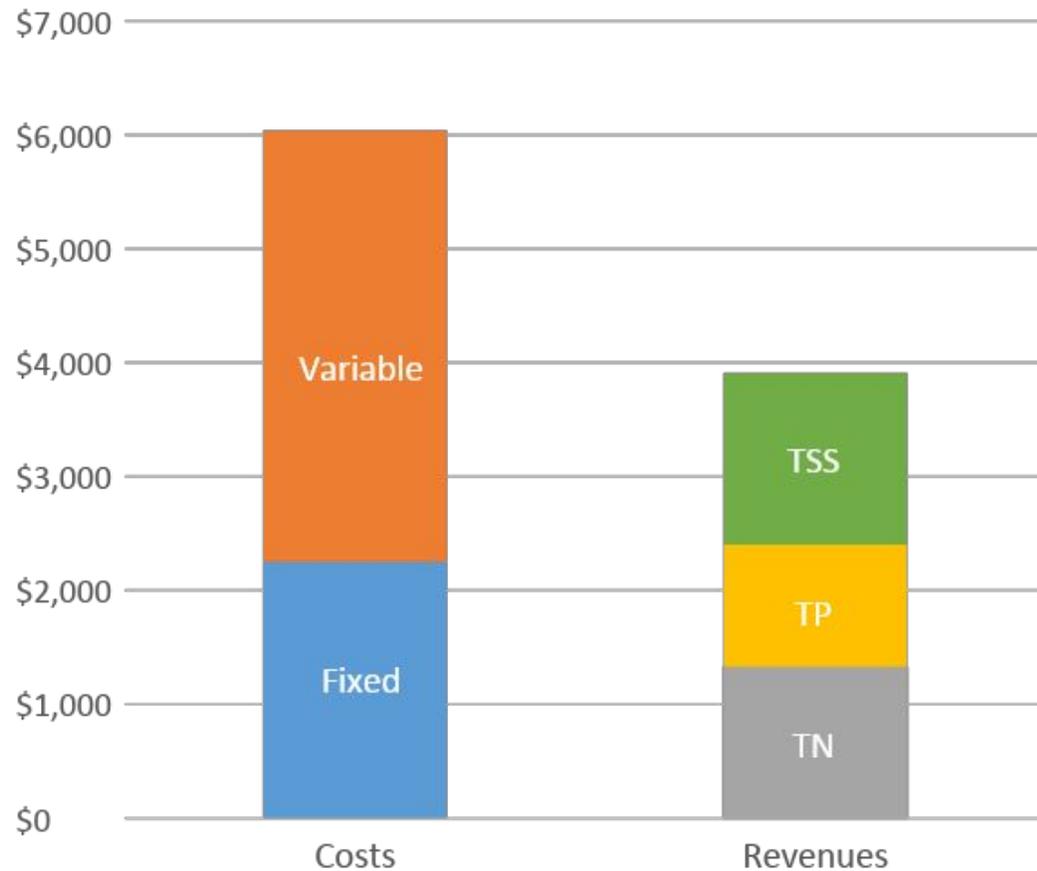
How credit stacking/unbundling could affect markets

- Additional value of producing co-benefits balances cost with willingness to pay (WTP)
- Public goods or co-benefits may need to be compensated through government payments or other incentives



Does credit unbundling make the pro-environmental action profitable?

Shallow Marsh BMP data



Co-benefit rules create the incentive landscape

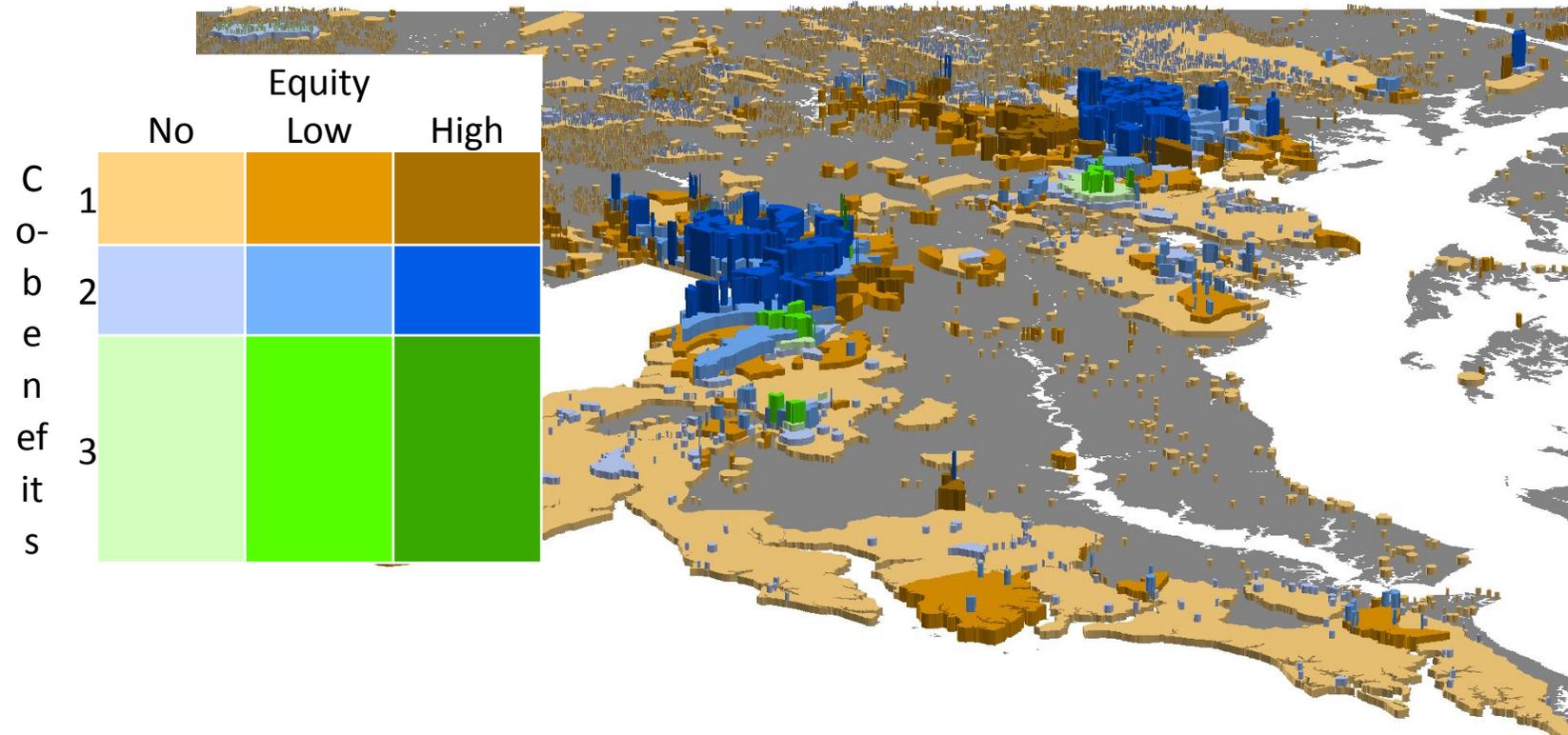
SW Benefits

- Water quality
- Flood risk reduction

Co-benefit multipliers

- Water recreation
- Edible Fish safety
- Heat Island
- Coldwater stream habitat
- Aquatic habitat
- Equity = helping disadvantaged communities

Potential stormwater credit value map



Conclusions

1. Credit markets that lower costs of regulatory compliance motivate buyers
2. Voluntary (& regulated) credit buyers may seek charisma over lowest cost
3. Government support can increase total social benefits of projects
 - Create financial incentives for co-benefits
 - Reduce transaction costs
4. Credit stacking/unbundling can increase the project financial feasibility, charisma, total benefits

