



Chesapeake Bay Program

Environmental Finance Symposium Recommendations Matrix

Core Recommendation #1: Advance a Chesapeake Bay restoration economic development effort.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Partnership	EPA and jurisdiction green infrastructure programs - green streets, green jobs Analyze current CBP BMPs to determine how they can support local and regional economies, including multiple benefits Since revenues for clean-up activities are hard to come by, and the need is great, we should look to alt. ways of bringing in financial resources. Identifying ways that we could generate revenues while helping with Bay clean-up is crucial	EPA & States help to eliminate regulatory barriers (e.g. waste-to-energy systems) Lack of consistency across state boundaries Need to add economic development experts into the PSC and/or State Finance Advisory Boards. Resources needed: Economists, universities, community colleges, EFC, State Economic Development Authorities, etc.	Short-term 12 to 18 months: Quantify the economic impact of WQ capital investments including grants (MDE) Possible steps: 1. Determine which grants will be evaluated. 2. Establish progress for determining economic impact of spending of grant money including procurement, employment, and other economic elements. 3. Determine reporting procedures (responsibility of grantee or grantor) (VA)	EPA Green Streets, Green Jobs, Green Towns (G3) Program and jurisdiction green infrastructure programs IMPLAN (Impact Analysis for PLANning) data exists for economic impact modeling/jobs created for financial investment by sector Prince Georges County and Corvias partnership is an excellent example of	Water Quality GIT Budget & Finance Workgroup EPA Region III, with help from States and HQ Initial costs may be able to be offset by benefits realized

Core Recommendation #1: Advance a Chesapeake Bay restoration economic development effort.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	Initial costs may be able to be offset by benefits realized Since significant financial investment is anticipated for Bay cleanup, there are opportunities to develop related industries and products; support/improve local economies; provide incentives for innovative practices that generate revenue and improve WQ; and quantify relationship between economic factors (e.g., jobs, labor force development etc.), environmental benefits, & financial investments In PA, one potentially important revenue generating/WQ improving avenue being explored is the growing and harvesting of revenue generating crops in riparian buffers. PA has also looked at breeding and selling freshwater	Improved water quality may be too much of an externality for certain business and/or industries to see economic benefit(s) as affecting their business in a positive manner Data on past sales of potential products, e.g. prices and quantities sold, are needed to build a business case for each potential product. Such data are not necessarily readily available Regulations or fees are usually what enable such efforts to be successful. E.g., in Prince Georges County, the stormwater fee provides the funds that are invested in restoration projects. The dedicated funding stream allows business to develop. Finding an entity to undertake and sustain the effort	Intermediate 1.5 to 3 years: Identify options for leveraging grant funds for increased capital investment / economic impact (MDE) Engage USDA and other potential sources of sales data to help build business cases. Need specific example of this action (MDE) Look for models elsewhere in the US or internationally and identify revenue generating WQ benefitting activities (MDE) Involve State depts. Of commerce and economic development in CBP Goal Teams/Workgroups to build a hub for clean water industries, skilled work force (MDE) Consult with economic development and education professionals to determine types of business and workforce education needs to	how to structure such programs. See attachment: "Elements of effective public-private partnerships" (STAC) PENNVEST revenue-generating examples on fresh water mussel hatchery and riparian buffers (PENNVEST)	

Core Recommendation #1: Advance a Chesapeake Bay restoration economic development effort.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	mussels, which looks promising at the moment. A similar model could be applied to other species, particularly oysters Market Bay Restoration as economic development Opportunity to ensure economic impacts of restoration spending (jobs, activity) are kept local and that investments lead to development of business capacity that may be exported outside the region Powerful potential outcomes that are politically bi-partisan and attractive to the private sector		realize full economic potential. (VA) Create enabling conditions for engaging private finance in Bay restoration. A first step would be to develop a standardized water quality credit system for the watershed. This could be done by the CBP BMP Verification Review Panel and STAC. (MDE) Long-term >3years: Establish a Bay-wide revolving loan fund for revenue generating nutrient reduction efforts. (MDE) This effort would need greater detail, work effort, coordination among states, a significant federal contribution, and realistically be accomplished at the federal level. Feasibility needs to be assessed. (VA)		

Theme Recommendation #3: Advance public-private partnerships, where appropriate.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Individual States with Partnership support	Improved asset management Projects can get off the ground faster and be completed sooner Potential for lower project cost(s) P3's can be structured to achieve ancillary benefits P3 preference (provide bonus points) in project selection for State grant funding. For non-compliant regulated communities encourage P3 to expedite progress. Green infrastructure projects most likely appropriate targets. Working through non-profits that then work with farmers may increase	Inadequate institutional structures to facilitate P3's Having adequate understanding of WQ financing needs at the community level Restrictive local procurement practices; staff resistance to change Regulatory agencies need to enforce timely compliance with permits (e.g., MS4) Private businesses and their business models must be heavily scrutinized prior to contracting in order to prevent future taxpayer subsidization of a failing business Costs may be high initially Communicating the value proposition for private sector participants	Short-term 12 to 18 months: Collect and disseminate lessons learned from existing P3 projects Evaluate statutes in each state to determine current authority for P3 projects addressing water quality, stormwater and related issues. (VA) Categorize potential private entities and see if there's any area to focus this effort Further explanation of this is necessary. This focus should be on water quality practices, particularly in urban areas. (VA) Identify existing successful partnerships and discuss with them the pros and cons, including their advice for what to avoid/ potential issues. Understanding the underlying statutes are critical in this analysis. There are no examples of water quality	EPA Region 3 P3 Guide for Local Governments MD DNR Chesapeake and Coastal Bays Trust Fund engaged in a P3; want to do more if successful. DC Water & MD Prince George's County as examples. PA's investment in BION and EnergyWorks facilities (as example of potential pitfalls of these relationships) Case studies in the Chesapeake Bay watershed and elsewhere in the US	Water Quality GIT State agencies EPA Region 3 Contractor with Budget & Finance Workgroup oversight

Theme Recommendation #3: Advance public-private partnerships, where appropriate.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	farmer participation May be able to work with states to target existing grant funding keeping costs stable Case studies show it can work but opportunities for appropriate application may be limited	The business or outcome of the relationship must be able to eventually stand on its own without govt. assistance Promises cannot be made to private entities based on the unknowns of the future of the market (don't rely on overly optimistic predictions of future demand) Such partnerships are usually driven by regulation, fear of regulation, potential to earn/save money, or all of the above. Enabling conditions must be in place to make this both likely and successful. Often transaction costs need to be lowered to make such partnerships fruitful from the private perspective Understanding circumstances that establish strong opportunity	PPPs in Virginia. Pros and cons may be directly linked to the underlying statute as well as any contracts developed pursuant to those statutes. This item could be better addressed through the analysis suggested above. (VA) Identify the conditions and parameters that guide decisions on where P3s can be successful Intermediate 1.5 to 3 years: Municipalities need to assess local capacity and gaps Pilot Project: Nutrient purchase (\$/lb) as a commodity for cash, in lieu of funding the BMP (MDE) Long-term >3 years: Analyze expected outcomes of each project on its own merits. (VA) Put some kind of economic accountability structure to		

Theme Recommendation #3: Advance public-private partnerships, where appropriate.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
			monitor viability and success of these partnerships as they progress		

Theme Recommendation #1: Pilot pay-for-success investment models.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
State-led with Partnership support	Cost savings for the public sector Provides the potential for return on investment Offer incentives to improve performance innovation and lower costs Strong level of interest at State of Maryland. Current work could serve as model for other states See Core 2 (related): State funding programs undertake pay of success pilot program/projects May be able to look to nonprofits for guidance on how to do this well Potentially lower cost-risk for taxpayers; potential to utilize crowd-sourcing either explicitly or implicitly	Complex arrangements that require a lot of upfront work to set up State funding programs may need to be reformed to undertake pay for success projects Identifying and encouraging specific projects may be difficult Identifying potential revenue generating buffer crops and engaging the agricultural community Identifying who pays and what are their incentives for doing so Social Impact Bonds (SIB) are effective in limited instances and a challenge is to be able to identify high potential applications May not promote sufficient action but can be part of the	Short-term 12 to 18 months: Compile successful pilot project case studies from across the country Possible pilot projects (e.g. PA Susquehanna River Basin) Identify categories of projects we believe may work and evaluate the current ability of jurisdictions to undertake such an approach based on current law and regulation. (VA) Locating investors to work with Perhaps undertake similar efforts elsewhere in the watershed, either with buffers or with other approaches Long-term >3 years: Undertake a pilot(s) project within the Bay watershed Accounting for/monitoring success of these approaches	Pay-for-success learning hub, includes an assessment tool for governments to evaluate readiness to implement these programs The MD DNR Chesapeake and Coastal Bays Trust Fund currently has a pilot, want to do more if successful Internal: Expand on MD State pilot credit based project funding (in Cecil Co) XPRIZE, non-profit out of Silicon Valley PA DCNR's existing pilot program Case studies exist Partners with groups and organizations to	EPA States USDA Budget & Finance Workgroup

Theme Recommendation #1: Pilot pay-for-success investment models.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	Promotes innovation, cost-efficiencies, and social marketing. Entities could be encouraged to compete Recognition awards might be more valuable than money in cases where private firms or community groups want to (voluntarily) be good community actors Excellent approach for involving more private sector capital	overall package of changing attitudes		offer prize money for people to solve specific issues or create new technologies to help tackle issues, including water and environmental projects PA DCNR, with funding from PENNVEST and other sources, is piloting a program to establish revenue-generating riparian buffers. This will help determine feasibility of using this approach to help Pennsylvania meet its nutrient reduction goals under the Bay TMDL	

Overarching Recommendation: Create a Chesapeake Bay Program Finance Advisory Board.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Partnership (although individual states could create their own boards)	Environmental Finance Advisory Board could be the go-to entity for implementation of recommendations after Action Team dissolves Consider creating a CBP Finance Advisory Committee that would join other advisory committees to complement skill sets that are not yet addressed States can create a formal or informal finance board to see how state financial resources are being used and recommend more efficient options Could provide forum for identifying and discussing opportunities for deriving a financial benefit from Bay clean-up activities, and identify new revenue sources that could be brought to bear to help clean-up the Bay.	Cost of establishing and maintaining a Chesapeake Bay Finance Advisory Board would be high for CBP Since agencies can be parochial with their funding programs & priorities, they may not be open to program review by another entity Defining a consistent and ongoing purpose for the Board	Short-term 12 to 18 months: Contact EPA Environmental Finance Advisory Board to see if they might be willing to explore some of these recommendations with CBP Intermediate 1.5 to 3 years: Draft a charge/purpose statement to test the validity of the concept Long-Term >3 years: Address other recommendations first and decide whether it makes sense to establish a FAB, and how to pay for it	EPA (HQ) National Environmental FAB (could CBP access this group for select issues?) EPA's new Finance Resiliency Center EFCs throughout the country Aspects of the process that the Action Team is engaged in, as well as EFC more generally, are closely related to this	Management Board & Principals' Staff Committee decision Budget & Finance Workgroup support, or could fill much of the needs

Core Recommendation #2: Create a credit-based financing system and market infrastructure, basin-wide.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Led by Partnership, implemented by the states	Develop a system for using nutrient and sediment credits as the basis for restoration financing Link WQ restoration investments to reduce nutrient and sediment loadings Develop related metrics by which restoration progress can be measured Tie WQ restoration outcome to funding Outcome based funding; opportunity to think big, award large contracts based on cost/lb of pollution reduction Create water quality trading market infrastructure	Figuring out all the costs associated with a WQ BMP, including design, construction, and O&M Difficulty of coordinating a system across multiple jurisdictions with different regulatory environments and market construction Pay for performance systems are a new way of doing business for most governments Changing grant-based funding programs to investment-based programs is difficult There does not seem to be a willingness for some states to put forth effort required to get this done	Short-term 12 to 18 months: Pilot interstate trades within the same river basin Create a team to address the challenge of establishing a common unit of measurement for credits generated in different locations Raise the visibility and enhance the structure of the Trading and Offsets Workgroup in the WQGIT Intermediate 1.5 to 3 years: Create enabling conditions for engaging private finance in Bay restoration. A first step would be to develop a standardized water quality credit system for the watershed. This could be done by the CBP BMP Verification Review Panel and STAC. Long-term >3 years:	Chesapeake Atlantic and Coastal Bay Trust Fund EPA Technical Memoranda on Jurisdiction Offset and Trading Programs, and EPA draft paper on interstate trading Previous study by CBC MD State pilot credit based project funding (in Cecil Co) Methodologies for identifying credits from various activities are in place – just have to be applied on a broader scale There is a long history on this topic in the WQGIT workgroups	Trading and Offsets Workgroup Water Quality GIT CBPO or EPA Region 3, with help from HQ STAC can help with structuring data and information in ways that can support performance financing. (This is only one element of the effort that will be needed).

Core Recommendation #2: Create a credit-based financing system and market infrastructure, basin-wide.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	Advance existing state trading programs This mechanism provides a potential way to achieve Bay clean-up in the most cost-effective manner Performance financing is a way to promote quality of projects and innovation. Innovation can lead to reduced costs	Restrictive local procurement practices; staff resistance to change State funding programs will need to be reformed States need to have nutrient trading policies Establishing a common unit of measurement for credits generated in different locations throughout the Bay watershed so that we have one common commodity that can easily be traded Technical & legal difficulties are numerous; however, that doesn't mean that the problems are intractable Creating a viable market with both supply and demand Verification of credit validity Defining and implementing a performance-based approach	Establish a Bay watershed interstate trading program	and in jurisdiction WIPs CBPO has some of the data needed to project performance. Some academic researchers have captured variability of management practices, which will also be helpful. Practical efforts to implement assurance bonds also seems relevant here.	

Core Recommendation #3: Establish implementation and performance standards, basin-wide.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Partnership	CBP BMP efficiencies could be used as a starting point for the physical standards To develop a handbook of accepted performance outcome standards (for Agriculture and MS4 Best Management Practices [BMP]) Would be a powerful cross-partnership outcome to unify such standards	This would only be necessary if Core 2 were to be implemented, which is not high priority Reaching science based consensus on performance standards Would such standards actually be implemented?	Short-term 12 to 18 months: Feasibility assessment Intermediate 1.5 to 3 years: Develop a workplan	Some standards already exist Existing jurisdictional trading programs Mitigation banking	Budget & Finance Workgroup Water Quality GIT Stormwater Workgroup

Core Recommendation #4: Reduce unnecessary transaction costs.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Individual state and local action	Streamline State permitting and approval processes. Focus on critical permits (e.g., waterways) that cause major delays Reducing transaction costs is crucial to enabling market forces to thrive. This recommendation underpins many of the other goals, e.g. P3s. Simpler rules and efficient permitting lead to higher levels of participation in markets or psuedo-markets, which can offset any environmental inefficiencies of the simpler rules Replicable process enhancements	Permit reviews by multiple agencies Some permits (e.g., waterways) require multi-agency reviews Perceptions of regulators and environmental groups seems to be that complex rules bring certainty. Field experiments and models of human behavior generally do not bear out this perception Span of control/influence	Short-term 12 to 18 months: Identify potential pilot projects	Pooled Monitoring Approach (Chesapeake Bay Trust) States' examples Public and private Lean and Six sigma projects LGAC-Chesapeake Legal Alliance joint project to review of procurement barriers and options for overcoming barriers (PA)	Budget & Finance Workgroup LGAC or Local Leadership Workgroup Volunteer lead entity needed

Core Recommendation #5: Facilitate the flow of capital through innovative institutional structures.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
Individual states	The ultimate product of this recommendation should be a self-sustaining revolving fund, where innovative tech./practices are funded, then pay back a % of future proceeds, growing the fund. Implementing pay-for-success measures into existing funds could also be a product Provide funding based on project cost efficiency, performance outcome or nutrient trading Assessment of potential value needed to know scale of the opportunity	Developing a regulatory environment in the bay watershed where work can take place across jurisdictional boundaries Securing the initial funds from each state Create capital funding programs that are not subject to annual use-it-or-loose-it funds Ability to influence systems that are tightly owned by partners	Short-term 12 to 18 months: Feasibility study Determine the scale of potential benefit - how often are funds lost or misappropriated? Intermediate 1.5 to 3 years: Development of regulatory infrastructure necessary to create/ foster/strengthen water quality markets Long-term >3 years: Establish inter-jurisdictional fund	PENNVEST MD Water Quality Financing Admin.	Budget & Finance Workgroup

Theme Recommendation #2: Establish proactive stormwater banking programs.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
State and local level	Provides lower cost options for meeting stormwater requirements and complying with MS4 permits Can provide property owners relief from stormwater utility fees Local governments to create SW bank to sell credits to developers as offsets Cost-efficiency and economies of scale Would augment trading programs	Long payback periods for BMPs make it difficult to justify investment - offsite stormwater fee credit programs help address these issues Individual homeowner BMPs may not be certified by the State as a tradeable credit Many MS4 permittees are not in compliance with their own permits to spare any credits for banking Developers may be able to buy less costly nutrient credits from the Ag or WW sector, depending on the State nutrient trading policy Integration with existing trading programs	Short-term 12 to 18 months: Compile a list of case studies in Bay watershed/elsewhere Assess demand for (interviews and surveys with ratepayers and developers) and supply of potential locations for stormwater banks Look to the DC program for feasibility/potential improvements White paper describing extent to which concept is similar to wetlands and other banking programs Intermediate 1.5 to 3 years: Ensure that stormwater banking is enabled within local regulations and that fee offsets are allowed within program policies Determine program elements, including fee structure, crediting approach, admin. needs, and operating policies	RainPay Program (Anacostia Waterfront Trust) NFWF DC program Center for Watershed Protection's <i>"Potential Application of Stormwater Banking in the Chesapeake Bay Watershed Using Two Case Studies"</i> (2014) Washington D.C. stormwater credit program Jurisdiction trading programs and other banking programs	Contractor with Budget & Finance Workgroup oversight

Theme Recommendation #2: Establish proactive stormwater banking programs.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
			Replicate what works from DC in MS4 counties		

Theme Recommendation #4: Incentivize commercial landowners to mitigate nutrient and sediment emissions.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
States, with Partnership support	Possible tax break for commercial landowners that implement nutrient/sediment BMP's Tie in with existing nutrient trading programs Since Ag BMP can be cost effective (cost/lb) for nutrient trading, additional financial tax or depreciation incentives can further motivate private sector investments Environmental economists can be enlisted to estimate the fee structure that will generate the desired level of activity. Using fees or regulation to generate a particular level of action is a well-studied and well-understood phenomenon in this field Opportunity to integrate private capital	Federal legislation needed State conservation tax credit program could help here Fees/taxes politically unpopular Need for clear nutrient trading policy and market Costs, loans may not always be viable option Building relationships with certain commercial landowners may be difficult Landowners are most typically driven by regulation, fear of regulation, potential to earn/save money, or all of the above. Enabling conditions must be in place to make this both likely and successful. Learn from the mistakes of cities that have set the fee too low to create effective incentives	Determine the extent to which this is happening through the WIP process and other mechanisms Poll jurisdictions	This is essentially what the MD stormwater fee was designed to do In PA, this is mostly focused on farmers, who can be skeptical of working with government programs outside of USDA & State Departments of Agriculture	State agencies Water Quality GIT CBC promote legislation?

Theme Recommendation #4: Incentivize commercial landowners to mitigate nutrient and sediment emissions.					
Partnership vs. Individual Approach?	Opportunities	Challenges/Barriers (ex. cost, workload, resource implications)	Action Item(s)	Existing Related Work (internal, external)	Responsible Entity (ex. GIT, Workgroup, other partner)
	Already being done in some places, a partnership approach could provide stability and reliability to help grow existing programs	Developing the value proposition			

List of Contributors:

Agency, Department, Other Organization
U.S. Environmental Protection Agency (U.S. EPA)
Maryland Department of Natural Resources (MD DNR)
Maryland Department of the Environment (MDE)
Pennsylvania Department of Environmental Protection (PA DEP)
Pennsylvania Infrastructure Investment Authority (PENNVEST)
Scientific, Technical, and Advisory Committee (STAC)
Office of Virginia Governor (VA)