****

**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 jobsAnalyze current CBP BMPs to determine how they can support local and regional economies, including multiple benefitsSince 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 crucialInitial costs may be able to be offset by benefits realizedSince 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 investmentsIn 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 mussels, which looks promising at the moment. A similar model could be applied to other species, particularly oystersMarket Bay Restoration as economic developmentOpportunity 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 regionPowerful potential outcomes that are politically bi-partisan and attractive to the private sector | EPA & States help to eliminate regulatory barriers (e.g. waste-to-energy systems)Lack of consistency across state boundariesNeed 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. 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 mannerData 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 availableRegulations 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  | **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)

**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 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) | EPA Green Streets, Green Jobs, Green Towns (G3) Program and jurisdiction green infrastructure programsIMPLAN (Impact Analysis for PLANning) data exists for economic impact modeling/jobs created for financial investment by sectorPrince Georges County and Corvias partnership is an excellent example of 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) | Water Quality GITBudget & Finance WorkgroupEPA Region III, with help from States and HQInitial costs may be able to be offset by benefits realized |

| **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 managementProjects can get off the ground faster and be completed soonerPotential for lower project cost(s)P3's can be structured to achieve ancillary benefitsP3 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 farmer participationMay be able to work with states to target existing grant funding keeping costs stableCase studies show it can work but opportunities for appropriate application may be limited | Inadequate institutional structures to facilitate P3'sHaving adequate understanding of WQ financing needs at the community level Restrictive local procurement practices; staff resistance to changeRegulatory 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 businessCosts may be high initiallyCommunicating the value proposition for private sector participantsThe business or outcome of the relationship must be able to eventually stand on its own without govt. assistancePromises 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 perspectiveUnderstanding circumstances that establish strong opportunity | **Short-term 12 to 18 months:**Collect and disseminate lessons learned from existing P3 projectsEvaluate 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 effortFurther 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 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 monitor viability and success of these partnerships as they progress | EPA Region 3 P3 Guide for Local GovernmentsMD 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 GITState agenciesEPA Region 3Contractor with Budget & Finance Workgroup over-sight |

| **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 sectorProvides the potential for return on investmentOffer incentives to improve performance innovation and lower costs Strong level of interest at State of Maryland. Current work could serve as model for other statesSee Core 2 (related): State funding programs undertake pay of success pilot program/projectsMay be able to look to nonprofits for guidance on how to do this wellPotentially lower cost-risk for taxpayers; potential to utilize crowd-sourcing either explicitly or implicitlyPromotes 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 actorsExcellent approach for involving more private sector capital | Complex arrangements that require a lot of upfront work to set upState funding programs may need to be reformed to undertake pay for success projectsIdentifying and encouraging specific projects may be difficultIdentifying potential revenue generating buffer crops and engaging the agricultural communityIdentifying who pays and what are their incentives for doing soSocial Impact Bonds (SIB) are effective in limited instances and a challenge is to be able to identify high potential applicationsMay not promote sufficient action but can be part of the overall package of changing attitudes | **Short-term 12 to 18 months:**Compile successful pilot project case studies from across the countryPossible 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 withPerhaps 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 watershedAccounting 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 successfulInternal: Expand on MD State pilot credit based project funding (in Cecil Co)XPRIZE, non-profit out of Silicon ValleyPA DCNR’s existing pilot programCase studies existPartners with groups and organizations to offer prize money for people to solve specific issues or create new technologies to help tackle issues, including water and environmental projectsPA 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 | EPAStatesUSDABudget & Finance Workgroup |

| **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 addressedStates can create a formal or informal finance board to see how state financial resources are being used and recommend more efficient optionsCould 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 CBPSince agencies can be parochial with their funding programs & priorities, they may not be open to program review by another entityDefining 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 CenterEFCs throughout the countryAspects 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 decisionBudget & 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 loadingsDevelop related metrics by which restoration progress can be measuredTie WQ restoration outcome to fundingOutcome based funding; opportunity to think big, award large contracts based on cost/lb of pollution reductionCreate water quality trading market infrastructureAdvance existing state trading programs This mechanism provides a potential way to achieve Bay clean-up in the most cost-effective mannerPerformance financing is a way to promote quality of projects and innovation. Innovation can lead to reduced costs | Figuring out all the costs associated with a WQ BMP, including design, construction, and O&MDifficulty 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 governmentsChanging 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 doneRestrictive local procurement practices; staff resistance to changeState funding programs will need to be reformedStates need to have nutrient trading policiesEstablishing 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 tradedTechnical & legal difficulties are numerous; however, that doesn't mean that the problems are intractableCreating a viable market with both supply and demandVerification of credit validityDefining and implementing a performance-based approach | **Short-term 12 to 18 months:** Pilot interstate trades within the same river basinCreate a team to address the challenge of establishing a common unit of measurement for credits generated in different locationsRaise 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:**Establish a Bay watershed interstate trading program | Chesapeake Atlantic and Coastal Bay Trust Fund EPA Technical Memoranda on Jurisdiction Offset and Trading Programs, and EPA draft paper on interstate tradingPrevious [study](http://www.chesbay.us/Publications/nutrient-trading-2012.pdf) by CBCMD 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 scaleThere is a long history on this topic in the WQGIT workgroups and in jurisdiction WIPsCBPO 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. | Trading and Offsets WorkgroupWater Quality GITCBPO or EPA Region 3, with help from HQSTAC 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 #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 standardsTo 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 priorityReaching science based consensus on performance standardsWould 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 programsMitigation banking | Budget & Finance WorkgroupWater Quality GITStormwater 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 delaysReducing 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 rulesReplicable process enhancements | Permit reviews by multiple agenciesSome permits (e.g., waterways) require multi-agency reviewsPerceptions 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 perceptionSpan of control/influence | **Short-term 12 to 18 months:**Identify potential pilot projects | Pooled Monitoring Approach (Chesapeake Bay Trust)States’ examplesPublic and private Lean and Six sigma projectsLGAC-Chesapeake Legal Alliance joint project to review of procurement barriers and options for overcoming barriers (PA)  | Budget & Finance WorkgroupLGAC or Local Leadership WorkgroupVolunteer 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 productProvide funding based on project cost efficiency, performance outcome or nutrient tradingAssessment 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 boundariesSecuring the initial funds from each stateCreate capital funding programs that are not subject to annual use-it-or-loose-it fundsAbility 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 | PENNVESTMD 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 permitsCan provide property owners relief from stormwater utility feesLocal governments to create SW bank to sell credits to developers as offsetsCost-efficiency and economies of scaleWould augment trading programs | Long payback periods for BMPs make it difficult to justify investment - offsite stormwater fee credit programs help address these issuesIndividual homeowner BMPs may not be certified by the State as a tradeable creditMany MS4 permittees are not in compliance with their own permits to spare any credits for bankingDevelopers may be able to buy less costly nutrient credits from the Ag or WW sector, depending on the State nutrient trading policyIntegration with existing trading programs | **Short-term 12 to 18 months:**Compile a list of case studies in Bay watershed/elsewhereAssess demand for (interviews and surveys with ratepayers and developers) and supply of potential locations for stormwater banksLook to the DC program for feasibility/potential improvementsWhite 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 allowedwithin program policiesDetermine program elements, including fee structure, crediting approach, admin. needs, and operating policiesReplicate what works from DC in MS4 counties | RainPay Program (Anacostia Waterfront Trust)NFWF DC programCenter for Watershed Protection’s “*Potential Application of Stormwater Banking in the Chesapeake Bay Watershed Using Two Case Studies*” (2014)Washington D.C. stormwater credit programJurisdiction trading programs and other banking programs | Contractor with Budget & Finance Workgroup over-sight |

| **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 programsSince Ag BMP can be cost effective (cost/lb) for nutrient trading, additional financial tax or depreciation incentives can further motivate private sector investmentsEnvironmental 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 fieldOpportunity to integrate private capital Already being done in some places, a partnership approach could provide stability and reliability to help grow existing programs  | Federal legislation neededState conservation tax credit program could help hereFees/taxes politically unpopularNeed for clear nutrient trading policy and marketCosts, loans may not always be viable optionBuilding relationships with certain commercial landowners may be difficultLandowners 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 incentivesDeveloping the value proposition | Determine the extent to which this is happening through the WIP process and other mechanismsPoll jurisdictions | This is essentially what the MD stormwater fee was designed to doIn PA, this is mostly focused on farmers, who can be skeptical of working with government programs outside of USDA & State Departments of Agriculture | State agenciesWater Quality GITCBC promote legislation? |

**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)** |