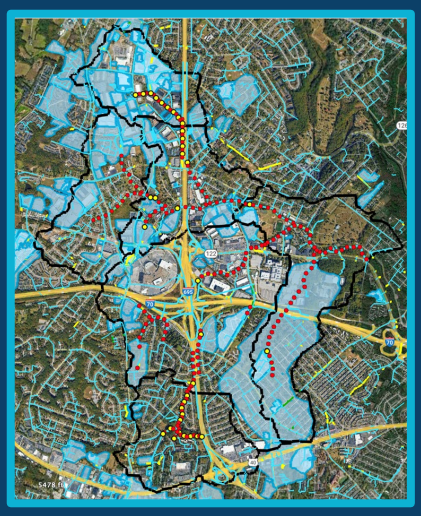

Pooled Monitoring Initiative's Restoration Research Award Program

FY 25 Request for Proposals

Chesapeake Bay Trust

Anne Arundel County Maryland

Montgomery County Maryland 1776

Maryland Department of Natural Resources

Maryland Department of Transportation State Highway Administration

United States Environmental Protection Agency

Chesapeake Bay Program
A Watershed Partnership

Baltimore City DPW Department of Public Works

Harford County Maryland

Prince George's County Maryland

Charles County Watershed Protection & Restoration

Frederick County, Maryland 1748

Maryland Department of the Environment

Pooled Monitoring Initiative's

Restoration Research Award Program

At A Glance

Program Summary:

The Restoration Research Award Program funds the answers to key restoration questions focused on the effectiveness of watershed restoration practices.

Information Session:

January 7, 2025, 12 to 1 pm (EST)

Deadline:

4:00 pm (EST), January 23, 2025

Submit Your Application:

Follow the instructions online at www.cbtrust.org/restorationresearch

Contacts:

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RFP release date: November 8, 2024

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Program Goals

Efforts to restore the Chesapeake Bay and its tributaries call for a significant increase in the number of watershed restoration projects intended to improve both water quality and habitat. The practitioner, regulatory, management, policy, and scientific communities are united in their desire to support the best, most cost-effective practices at the best sites. However, differences of opinion sometimes exist, and questions about the performance and function of some of these practices persist.

The Pooled Monitoring Initiative pools resources to support scientists who answer key restoration questions posed by the regulatory and practitioner communities through this Restoration Research Request for Proposals (RFP). The research teams then provide the answers back to those who asked the questions for direct application. The goal of the Restoration Research award program is to answer these key restoration questions that serve as a barrier to watershed restoration project implementation. Funding partners hope that answering these questions will ultimately lead to increased confidence in proposed restoration project outcomes, clarification of the optimal site conditions in which to apply particular restoration techniques, information useful to regulatory agencies in project permitting, and information that will help guide monitoring programs.

The ability to pool funding allows for rigorous research to address these large, complicated questions that require robust experimental design carried out by the best research teams. Finally, the RFP research questions are the result of the top key restoration questions identified for a particular year and the previous RFP questions may be removed while research is ongoing to inform future research direction. See past research supported including their progress and final products at: https://cbtrust.org/grants/restoration-research/.

This program is funded by the Chesapeake Bay Trust (the Trust), the Maryland Department of Natural Resources, the Environmental Protection Agency's Chesapeake Bay Program Office, Anne Arundel County, Baltimore City, Charles County, Frederick County, Harford County, Montgomery County, Prince George's County, and the Maryland Department of Transportation State Highway Administration. Additional funding partners are welcome, including Maryland Municipal Separate Storm Sewer System (MS4) permittees that opt in to the MS4 permit's Pooled Monitoring Program, federal organizations, states, municipalities, private sources, and others.

Information Session

A workshop at which the program will be described and questions from potential applicants will be answered will be held January 7, 2025, from 12 pm to 1 pm (EST). Register to attend at the following link: https://us02web.zoom.us/meeting/register/tZUufuqsqDotGdIIqcQaXQ9znYoqQATYh-tS this link will take you to a page to *register* for the zoom meeting. After you register, you will be sent a confirmation email containing information to join the meeting (meeting link, meeting ID, passcode). Any updates to this Information Session will be posted on this program's website.

Eligible Project Types

Members of the regulatory and restoration communities have worked together to identify several key restoration questions that are challenging watershed restoration work in the Chesapeake (see "Key Restoration Questions" section). Investigators may request funds to undertake the following activities pertaining to any of these questions:

a) Conduct a literature review/synthesis, if the case can be made that enough is already known about a question ($50,000 maximum request);
b) Answer a component of the question with a research project in which specific hypotheses are tested. Research projects may include:
    i. experimental or descriptive work in the field;
    ii. experimental work in the laboratory;
    iii. modeling studies; and/or
    iv. use of existing data, if deemed appropriately suited (properly collected with appropriate metadata); or
c) Develop a regulatory or practitioner tool related to one or more of the questions that advances the pace or efficacy of the field in question, if the case can be made the tool is needed and you have ample information to support tool development.

Experimental Design Guidance

This program supports research that addresses the key restoration question(s) in this RFP. Applicants must provide a graphical or tabular description of the study design. Experimental designs shall be robust and must be tailored to deliver the answer to the question. Applicants should build on previous Pooled Monitoring Initiative program research findings. Guidance for sampling is provided to support your study design.

Methodological Guidance

- Levels of the factor(s) to be compared must be clearly articulated in the description of the experimental design and a justification provided for their selection. Potentially confounding factors must be considered, discussed in the application, and, if sample size does not allow it, kept constant. Additional factors can be added as sample size allows.
- The strongest proposals will use paired series (Osenberg, et al., 2006[1]) or BACI (before-after-control-impact) designs with sufficient replication to capture variability and control sites to capture variability due to other factors. However, "space for time" experimental design will be considered, if justified (i.e., no "before" data were collected, but the sites provide a particularly good opportunity to test the research question).
- Sample size must be justified. As discussed above, applicants are encouraged to perform power analysis to determine whether the sample size chosen/possible is enough to be able to detect differences among treatments.
- **All water quality sampling projects intended to quantify loads must include methodology that captures both base flow and storm flow in a representative way**. The best way to achieve this standard is flow-paced sampling using automated samplers. See Thompson, et al. (2014[2]) for water quality sampling methods, associated error, and optimal sampling to reduce error.
- Studies that simply produce nutrient and sediment reduction values for one site/catchment in one set of site conditions will typically not be supported. We are looking for comparative studies.

[1] Osenberg, C.W., B.M. Bolker, J.S.S. White, Colette M. St. Mary, and J.S. Shima. 2006. Statistical Issues and Study Design in Ecological Restorations: Lessons Learned from Marine Reserves. Foundations of Restoration Ecology. Eds. Donald A. Falk, Margaret A.Palmer, and Joy B. Zedler. Washington, D.C.: Island Press. pp. 280-302.

[2] Thompson, Joshua, Rachel Cassidy, Donnacha G. Doody, Ray Flynn. 2014. Assessing suspended sediment dynamics in relation to ecological thresholds and sampling strategies in two Irish headwater catchments. Science of Total Environment (468-469): 345-357.

The following research questions are organized into three themes:

A. Effectiveness of stormwater and stream restoration programs at the watershed/catchment scale
B. Effectiveness of restoration practices at the project scale
C. Social science research questions to accelerate adoption of BMPs and help quantify targeted outcomes
D. Trade-offs in resource improvements incurred by restoration practices and the resulting net ecological change as measured by a common "currency"

A. **Effectiveness of stormwater and stream restoration programs at the watershed/catchment scale**

Questions 1 and 2 in this RFP are similar to the questions posed in the monitoring section of the Maryland MS4 permit. These two questions are extremely important in our understanding of whether stormwater best management practices (BMPs) including stream restoration practices are effective and are working at the watershed scale.

1. BMP Effectiveness Monitoring: What is the effectiveness of stormwater best management practices (BMPs) implemented in the Maryland Stormwater Design Manual? Does the provision of the full treatment volume for the 1-year 24-hour design storm event provide pollutant removal performance per the design manual? Is that storage effective in reducing the water flow enough to protect stream channels?

   Additionally, how effective is the BMP (or suite of BMPs) for reducing total suspended solids (TSS), total phosphorus (TP), or total nitrogen (TN)? We are particularly interested in green infrastructure practices as defined in the MDE's Accounting Guidance for green stormwater infrastructure credits and additional information at: https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/MS4%20Accounting%20Guidance%20FINAL%2011%2005%202021.pdf.

   How does the collection and conveyance system design impact BMP performance during high intensity storm events? How do subsoils/soil media composition, underdrain, and/or vegetative cover impact the effectiveness of the BMP (load/reduction relationship)?

   Possible Elements of the Experimental Design: 1) Conduct a study that applies a Before-After-Control-Impact (BACI) monitoring design. Ensure replication by selecting multiple drainage areas with similar characteristics. Characteristics within each drainage area should include drainage area size, gray infrastructure, % impervious cover treated, land use, and type and treatment volume of the proposed BMPs. Use the approved stormwater management criteria in Maryland's Stormwater Design Manual to determine the BMP's treatment volume for the 1-year 24-hour design event. Using a power analysis, determine the number of sites, samples, and years of sampling that are required to detect a statistically significant effect. Use regression or other methods such as randomized intervention analysis to determine if BMP implementation at full treatment volume protects stream channel stability, reduces peak streamflow, and reduces loads of TSS, TP, or TN. Compare measured load reduction percentages to the adjustor curves in Appendix A of MDE's Accounting Guidance to determine whether BMP performance is better or worse than expected. OR 2) Conduct a study that applies a Before-After-Control-Impact (BACI) monitoring design using multiple paired 'Control' (no BMPs) and 'Impact' (with BMPs) sites. The design of the implemented BMPs should vary by subsoils/soil media composition, underdrain type, and/or BMP vegetative cover. Ensure replication by selecting multiple drainage areas with similar characteristics such as drainage area size, gray infrastructure, % impervious cover treated, land use, and type and treatment volume of the BMPs implemented. Use the approved stormwater management

criteria in Maryland's Stormwater Design Manual to determine the BMP's treatment volume for the 1-year 24-hour design event. Using a power analysis, determine the number of sites, samples, and years of sampling that are required to detect a statistically significant effect. Use regression or ANOVA to determine if TSS, TP, or TN load reduction differs based on BMP subsoils/soil media composition, underdrain type, and/or vegetative cover. Compare load reduction percentages to the adjustor curves in Appendix A of MDE's Accounting Guidance to determine if BMP performance with contrasting subsoils/soil media composition, underdrain type, and/or vegetative cover is better or worse than expected.

2. Watershed Restoration Assessment: What are the cumulative effects of watershed restoration activities within a watershed? Of interest in the restoration community is whether, given the high temporal and spatial variability of nutrient concentrations and flows, impacts to biological community, a signal from the restoration activities even in a highly targeted, small watershed (having first order streams) can be measured relative to a control site (before vs. after restoration activities).

   The following are related questions: What percentage of the impervious surface in a watershed must be treated with stormwater upland BMPs before a difference can be measured at the outfall? Does a BMP type or suite of BMPs (e.g., ESD practices, stormwater wetlands) influence that percentage? Does the location in the watershed where the BMPs are located and/or the concentration of impervious surface areas or forested areas (for tree planting projects) located in the watershed impact the restoration outcomes?

   We recognize that this question is extensive, and reviewers will accept proposals that address just one component of this research question.

   Possible Elements of the Experimental Design: 1) Conduct a study that applies a Before-After-Control-Impact (BACI) monitoring design. Ensure replication by selecting multiple first order non-tidal watersheds with similar characteristics. Characteristics within each watershed should include drainage area size, gray infrastructure, % impervious cover, land use, and type and treatment volume of the proposed BMPs. Use sub-hourly in-situ monitoring of flow, nitrate (using a UV sensor), sediment and phosphorus (using turbidity as a surrogate) in both the 'Control' (no BMPs) and 'Impact' (with BMPs) watersheds. From the sub-hourly datasets collected both before and after BMP implementation in both the 'Control' and 'Impact' watershed, use subsampling and simulation to derive temporally coarser datasets of nitrate, sediment, and phosphorus following standard temporal sampling methods (e.g., weekly, monthly, storm sampling). Use regression or other methods such as randomized intervention analysis to determine if the benefits of BMP implementation can be detected using standard temporal sampling methods (e.g., weekly, monthly, storm sampling), and assess their ability in comparison to the strength of the signal determined from the sub-hourly datasets. OR 2) Select multiple first order non-tidal watersheds with similar characteristics. Similar characteristics within each watershed should include watershed size, gray infrastructure, % impervious cover, and land use. BMP implementation data should be gathered from geospatial data that is submitted to MDE by MS4 jurisdictions. Using the geospatial data together with MDE's Accounting Guidance, determine both the acres of impervious surface treated and percentage of impervious area treated by upland BMPs within each watershed. Watersheds should vary in the total percentage of impervious acres treated from 0 to at least 30%. Streamflow, water quality sampling, and biological monitoring (following Maryland Biological Stream Survey [MBSS] methods) should be conducted for a minimum of two hydrological years. Using regression or alternate statistical techniques, compare watershed loads of TN, TP, TSS, peak flows, and IBI scores against the percentage of impervious surface treated in the watershed.

B. **Effectiveness of restoration practices at the project scale**

3. A) Biological Community Restoration (Physical and Chemical): Recent research has shown that in many situations, especially in watersheds with relatively high impervious cover, stream restoration may result in improved physical habitats but not restored biological communities (macroinvertebrates, fishes, etc.). The reasons are not yet clear, but three hypotheses are high flows (impact benthic drift behaviors, suspended sediment tolerance, available carbon), the lack of source populations (research underway, "Assessing the feasibility of assisted macroinvertebrate colonization in achieving ecological uplift in restored streams"), and physiochemical habitat barriers (e.g., conductivity, temperature, and pollutants of emerging concern such as chloride and toxic substances among others). We seek a research team to test the influence of physical and chemical features on stream biota in stream restoration projects.

   Possible Elements of an Experimental Design: Choose a set of restored streams where physiochemical habitat barriers exist and determine how those stressors impact the biological community(ies) (compared to some reference quality/level), assign some to an experimental treatment (stressor or stressors present) and leave some as control(s). The research team could measure biological community(ies) before and after a "stressor event" (to be defined as reaching a threshold or duration/exposure to test). Applicants should include enough sites/replicates to account for stream restoration type (or restoration function restored), stream restoration size/scope, stream size/flow, stream benthic type, impervious cover draining to the stream restoration site, and other factors that could confound the results.

   B) Biological Community Restoration (eDNA Literature Review): We may not be detecting changes in biological uplift (see A above). Recent research in this program, "Using eDNA Methods to Extend Biological Sampling and Identify Candidate Restorations for Species Reintroductions" (June 2024 presentation available at: https://cbtrust.org/wp-content/uploads/3_Hilderbrand-2024-pooled-monitoring-annual-meeting-final.pdf) uses eDNA to identify subtle changes (presence/absence) in more sensitive species/individuals. This approach addresses community composition changes that current biological sampling methods for macroinvertebrates and fish might miss. However, there are still some unresolved questions regarding these methods, some of which include 1) the appropriate distance for a control sample upstream of a restoration site; 2) sampling methods, especially, the sample volume needed to obtain a reliable assessment of taxa present in all stream/river types in Maryland; 3) how to decrease uncertainty in results by minimizing false positives and negatives; and 4) how to interpret eDNA findings given inherent levels of uncertainty in the results and gaps in our eDNA library. In addition, we need to connect eDNA sampling outputs with traditional methods, such as the Index of Biological Integrity (IBI) for benthics and fish, which are often tied to regulatory drivers.

   To build on this research and enhance its utility for managers, we request a literature review that outlines the current state of the science, including a gap analysis. This information will help us prioritize the most critical research areas to meet our needs.

   Possible Elements of an Experimental Design (if you can provide a literature review to support your research project vs to provide the literature review as the project): To evaluate the effect of upstream controls on eDNA in restored stream reaches, select multiple non-tidal watersheds featuring both restored reaches and upstream controls. Watersheds should be chosen to vary by drainage area and stream order but should have similar restoration ages to control for time-related ecological changes. Sampling locations should be established at set intervals (e.g., 100 feet) within both upstream control reaches and restored reaches. Traditional biological sampling should be conducted to calculate benthic and fish IBI scores alongside eDNA sampling at each interval. eDNA sampling should be conducted with multiple replicates, testing different sample volumes to determine optimal eDNA capture. Stream flow should be measured concurrently to account for flow variations that might affect eDNA results.

Regression analyses should be used to examine the relationships between the drainage area to each sampling location, streamflow, sampling distance from control sites, and eDNA results. This approach will help to identify the optimal distance between eDNA sampling in control and restored sites and develop a sampling distance principle based on watershed size and streamflow. The eDNA data from replicate samples should be compared to traditional IBI results to determine convergence between methods, helping to validate the eDNA approach. The findings will also be used to determine the minimal viable sample volume needed for reliable detection, ensuring that eDNA sampling is both efficient and representative of biological conditions.

4. Climate change impacts to restoration practice: Climate change models predict that frequency and intensity of rain events will increase, growing season will lengthen, and other processes related to the Chesapeake community's approved set of BMPs will change. As a result, some suggest that standards for stormwater practices, stream restoration, and other BMPs should change (e.g., need to evaluate high intensity storms of varied frequencies (vs 24-hour event), conveyance limitations, etc.). This program supported three studies to address an earlier question about storm frequency duration and how this can impact BMP designs. While research findings are actively informing ongoing efforts to modernize stormwater management – such as Advancing Stormwater Resiliency in Maryland (A-Storm) initiative – funders this year are focusing on the need to better understand the vegetation choices and adjustments required for a changing climate.

   The vegetation elements of the BMP design (e.g., plant palette and maintenance schedules) can impact both evapotranspiration (heat island) and pollutant removal efficiencies of the stormwater BMP. How will climate change (extreme heat and wind or storm intensity and duration) impact the vulnerability and ultimate performance of these plants? We know that precipitation patterns are changing and our suite of strategies, tools, and/or BMPs should expand. Therefore, funders are interested in a literature search for flood attenuation strategies and associated water quality benefit (loads reduced for TN, TP, TSS, etc.).

   Additionally, we realize that restoration in coastal areas presents conditions where additional research efforts are needed (e.g., high water tables, tidal influence, and/or storm surge). *The ultimate use of this information would be to evaluate design criteria of these BMPs* (new or retrofits) that achieve the most effective treatment and conveyance strategies when comparing varied rainfall design storm scenarios.

   Possible Elements of the Experimental Design: Conduct a comparative field study of multiple upland stormwater ponds. The design of the implemented BMPs should vary by plant palette and vegetation maintenance schedules. Ensure replication by selecting multiple drainage areas with similar characteristics such as drainage area size, gray infrastructure, % impervious cover treated, land use, and type and treatment volume of the BMPs implemented. Use the approved stormwater management criteria in Maryland's Stormwater Design Manual to determine the BMP's treatment volume for the 1-year 24-hour design event. Using a power analysis, determine the number of sites, samples, and years of sampling that are required to detect a statistically significant effect. Install evapotranspiration monitoring stations (e.g., Campbell Scientific ET107) to determine evapotranspiration and quadrats to assess long term plant palette viability. Target water quality sampling of pond discharge over a range of temperatures across multiple seasons, ensuring that ponds are sampled at times of the day with similar levels of photosynthetically active radiation. Use ANOVA to determine if TSS, TP, or TN load reduction differs based on plant palette/vegetation maintenance schedule. Use regression to determine if plant palette/vegetation maintenance schedule affects evapotranspiration rates.

5. Pollutants of Emerging Concern: Fecal indicator bacteria; chloride; temperature; and toxics, particularly polychlorinated biphenyls (PCBs) have been identified as "emerging pollutants" of concern by the

restoration community, beyond the "traditional" pollutants of nitrogen, phosphorus, and sediment that have been the focus of much of the research to date. Therefore, questions within this area are:

a. Bacteria and Chloride – To better inform choices of existing management options, funders participating in the Pooled Monitoring option in Maryland's MS4 permit are interested in research that advances existing science related to the baseline conditions and sources of bacteria and/or chloride in urban streams. Funders are also interested in existing or novel sampling and analytical methods that could better quantify pollutants entering waterways and differentiate between the primary sources. Such research may include developing a relationship between *E. coli* eDNA and *E. coli* most probable number (MPN)/100 mL, the feasibility of using automated samplers for bacteria sampling in lieu of grab samples, and the relationship between chloride concentration and specific conductance. Ultimately, funders want to use this research to identify new and/or to enhance existing, management measures that reduce bacteria and chloride concentrations in receiving waters. Applicants should be aware of and build on two projects supported in 2024, "Use of molecular sewage indicator methods to reduce uncertainty in watershed remediation efforts and water contact recreation" and "Combining incubations, sensors, and molecular approaches to understand E. coli sources and wastewater contamination across the Anacostia River Watershed" with more details at: https://cbtrust.org/grants/restoration-research/.

   Questions for researchers to address are:

   i. What are the typical bacteria sources and their relative contributions for urban watersheds? Of interest are methods of sampling (e.g., autosampler vs. grab sampling), developing relationships between eDNA and actual counts of *E. coli* and *Enterococcus*, and researching and updating the proportional bacteria contributions to non-tidal stream systems from diverse sources. Funders are also looking for novel methods to quantify the bacteria sources.

   ii. What are the effects of salt reduction strategies on in-stream chloride concentrations and specific conductance in nontidal perennial streams?

   Salt reduction strategies should align with the MS4 permit's pollution prevention and good housekeeping control measures such as brine application. Funders are interested in the amount of salt delivered from the application point to the stream and the time this takes. Funders are also interested in the baseline conditions and the change from salt application. We realize that sample size, methods used, and replication could be costly and may be scalable. The funders will consider literature reviews and/or pilot efforts for one or both questions. The MDE monitoring guidelines may be used as reference and can be found here: https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/Final%20Determination%20Dox%20N5%202021/2021%20MS4%20Monitoring%20Guideline%20Final%2011%2005%202021.pdf.

b) Thermal – What best management practice design and siting methods will reduce thermal impacts to streams, and in Maryland there is interest in Maryland's Use III and IV streams (see the Maryland Stormwater Design Manual Section 4.1), and to the watershed? Management practice design/strategy examples to test include various surface ponding and discharge structure configurations, variable media depths in filtering practices, use of submerged gravel wetlands, and specific stream restoration design features and types such as legacy sediment removal, stage zero/emergent wetlands, and other management strategies.

   Applicants should be aware of and build on, if possible, the following projects: 1) supported in 2021, "Evaluation of watershed-scale impacts of stormwater management facilities on thermal loads to a Maryland Class IV stream using a high-frequency sensor network" as described in the 2024 forum

presentation available at: https://cbtrust.org/wp-content/uploads/2_Welty-Miller-Restoration-Research-2024-v4.pdf and the Maryland Water Monitoring Conference presentation titled "Thermal properties of different stormwater Best Management Practices" that is available at: https://tinyurl.com/pnfdnc2h and 2) supported in 2023, "Stormwater Thermal Reduction through Stormwater Filtration Media Layers" with more details at: https://cbtrust.org/grants/restoration-research/.

Current state (Maryland) modeling exercises in urban watersheds indicate that reductions in heated surface runoff and increases in riparian forest buffers are necessary to meet thermal water quality endpoints (68° F or 20° C for Use Class III streams). What is the thermal load to and the cumulative impact of thermal mitigation practices in urban and rural watersheds? If possible, explain how practices were combined to reduce thermal impacts to streams.

Possible Elements of the Experiment Design: Compare stream thermal condition in watersheds/catchments restored with different stormwater management BMPs (e.g., wet pond retrofits with various surface ponding and discharge structure configurations or ESD filtration practices using variable media depths) or restored with different stream restoration techniques. Follow the methodological guidance provided above in this RFP.

c) Toxics – Many regional water bodies have toxic substance impairments, particularly for PCBs. Some progress has been made in identifying the influence of specific land uses, industry types, and development age on toxic contaminant loadings. However, there are still many unknowns related to the fate, transport, capture, and impact of toxic pollutants. For instance, it is often unknown whether practices used to reduce sediment and nutrient loads can also reduce toxic contaminant loads, and for innovative stormwater designs specifically aimed at reducing toxic contaminants, it is unknown exactly how effective these practices can be. Additionally, given the lack of information on the impact of toxic contaminants on biota, it is possible that additional stressors are being overlooked in assessments such as Maryland's Biological Stressor Identification analyses. Consequently, there could be significant gaps in management strategies to restore biological communities in streams. This research question was scaled back to focus on monitoring while the results from University of Maryland's "Influence of historic and current land use practices on PCB contamination of soils and stormwater sediments in the Chesapeake Bay watershed" are underway. Research applicants should also be aware of and build on a project supported in 2024, "Development of a simplified approach of PCB loading estimation using a combination of passive sampling and sediment trapping" with more details at: https://cbtrust.org/grants/restoration-research/.

A frequent limitation to optimal stormwater monitoring protocols and design implementation is the availability of funds and personnel. Traditional practices, such as automated samplers, are efficient but can be costly and frequently difficult to install and maintain. Considering those challenges, what innovative techniques that are affordable and of simple installation and maintenance could the monitoring community use to measure PCBs concentrations during storm events in outfalls, pipes, BMPs, and/or inlets?

C. Social science research questions to accelerate adoption of BMPs and help quantify targeted outcomes

6. Practice adoption: The adoption of certain practices by individuals (residents, business owners, landowners, etc.) can play a large role in accomplishing big picture watershed restoration goals. Many practices can be adopted at the individual level, and many jurisdictions have developed programs to encourage them, such as rebate programs. However, the likelihood of adoption and barriers to adoption of those practices is not always known. If barriers to adoption and adoption rates were better known, the

design of incentive programs could be optimized, and outcomes of those programs could be better quantified. While many practices need additional study, this program intends to focus on four key practices that are of particular interest to its MS4 members.

For one of the following four practices (tree planting, litter reduction, pet waste removal (which reduces bacteria contamination), reduction of flushing fats oils and grease (FOG) down drains (which can lead to sanitary sewer overflows)), quantify adoption rates under certain program/intervention design. Ideally, programs with different types and numbers of interventions, designed to address barriers to adoption, would be compared (e.g., program designs that test and involve in-person interaction (door knocking, workshops, demonstrations) versus remote interventions (e.g., email, mailer, phone call, door hanger). Program elements to be tested could include paid incentives and perception of the threat of enforcement action(s). What are the adoption rates of the practice under programs with different elements, which, when combined with existing information about BMP effectiveness, can lead to total loads reduced (of nutrients, sediment, bacteria, and/or litter)?

Possible Elements of an Experimental Design: Choose one of the four practices identified above. Create three levels of a program designed to encourage implementation of that practice: a high intensity intervention program with 5+ interventions of various types (e.g., in-person workshops or events, door-to-door visits, door hangers, mail/email communications, incentive payments/rebates, etc.), a medium intensity intervention program with 3 interventions of various types, and a low intensity intervention program with only 1 intervention. Choose one audience, with an eye towards keeping confounding factors (e.g., geographic area, demographics, lot size, impervious area) as non-variable as possible unless audience sample size is large enough to withstand variability. Randomly assign households/entities within the audience to each of the three intensity levels. Implement the intervention program, then test for adoption rate of the practice compared across intensity levels. Adoption rate may be measured by visual confirmation, surveys, or other methods. Consider testing other factors as budget/study design allows (e.g., program characteristics, such as requiring audience members to implement the practice vs. offering a third party contractor to install).

7. Focusing our social science research questions on impactful interventions and stewardship programs that can help us better meet our healthy water and healthy community outcomes, we pose the following questions:
   a) What social science interventions (beyond communication strategies) are most effective at increasing and sustaining adoption of maintenance behaviors, such as regular watering, mulching, pruning, and weed control by individual residents?

      Possible Elements of the Experimental Design: Researchers could experiment with different interventions, such as offering material incentives (e.g., subsidized tools), integrating stewardship into local cultural practices, or creating neighborhood-based peer support networks, and measure their long-term impact on individual and collective maintenance behaviors.

   b) What social science interventions are most effective at increasing local civic engagement in support of watershed stewardship programs and policies?

      Possible Elements of the Experimental Design: This could be explored through field experiments or community trials that test various interventions (e.g., policy advocacy training (not lobbying), social media campaigns, community forums, or civic engagement apps) to measure their effect on civic participation rates and engagement in local watershed-related policy discussions.

c) What environmental stewardship practices resonate most with overburdened communities in the watershed, and how can these communities' perceived barriers to adoption inform the development of community-centric stewardship programs that provide relevant products and services to address perceived barriers to adoption?

Possible Elements of the Experimental Design: Researchers could explore participatory approaches such as community surveys, focus groups, or co-design workshops to assess and identify specific practices perceived as valuable and feasible by these communities. Additionally, they might experiment with different engagement methods to determine which elicits the most community participation relative to particular sub-demographics.

D. Trade-offs in resource improvements incurred by restoration practices and the resulting net ecological change as measured by a common "currency"

8. Resource trade-offs in different types of restoration projects. The decision to install a restoration project at any given site by definition implies that an existing condition at that site will be modified, replaced, and/or improved. The hypothesis of the restoration practitioner is that the net condition will be *improved.* However, a value judgment is placed on the existing condition, (e.g., deeming the existing condition to be inferior to the desired "restored" condition) that is often not based on quantification. In addition, there is an accompanying value judgment on the proposed resulting condition that may not take into account the reductions of certain functions (e.g., removing trees to create a wetland). One difficulty is that the units of the resource negatively affected are often not the same as the units measured to report the restoration work (often, for example, pounds of nitrogen reduced).

   The goal of this question is to encourage quantification, in some comparable metric, of the resources present prior to the activity compared to the resources available after restoration project installation, calculating net ecological impact after evaluation of individual functional components. One way to explore the "positive" and "negative" impact is to have at least two resources using common metric(s) (e.g., vegetation biomass, pounds of pollutant reduced, a habitat metric) to determine the net change. Funders want to know if we use certain kinds of restoration practices or projects, do the net benefits (e.g., nutrients, sediment, habitat, hydrology, biological resources) outweigh the net impacts (e.g., tree loss and resulting habitat loss, etc.)?

   Ultimately, we want to use the research findings to determine what practices and projects are best suited for our needs, to have a better understanding of the "trade-offs" when installing a practice, and to have greater confidence in our recommended practices and projects. Ensure your application clearly states to our second-round reviewers (regulators and managers who will use the results) how your research will support the best management practices we implement and/or recommend for implementation (e.g., through our policies, decision-making frameworks, practice manuals, etc.).

   Resource trade-off examples include, but are not limited to, the following:

   - Tree planting "success" for plant establishment, survival, and ecological benefit: Tree planting establishment efforts are common as both standalone projects (e.g., buffers) and components of other BMPs (e.g., stream restorations, stormwater bioretention, etc.). As practitioners, policymakers, and funders, the community wants to determine how to assess tree planting "success" to guide us for more sustainable, ecologically beneficial, and cost-effective plantings. Therefore, our top question is: **How do we measure tree planting project "success"?**

     We want tree planting projects to be successful in terms of many factors such as site selection; site preparation; size, type, and/or density of plantings; project acceptance by community; survivability;

ensuring equity* is considered in our projects; and attaining ecological and habitat benefits all while demonstrating cost effectiveness. Researchers should consider the following sub-questions that get at the "success" of a project:

a) How does site selection, preparation (e.g., soil decompaction or amendment), and maintenance (including invasive management**) impact the outcome of interest (tree survival, canopy cover, habitat)? Applicants should be aware of the recently completed project, "Reforestation Restoration Success – Measuring Early Forest Development After Land Disturbance with Soil Chemistry and Understory Vegetation" with final report at: https://cbtrust.org/wp-content/uploads/Mid-Atlantic-Applied-Nucleation.pdf.

b) Stream restoration often entails reconnecting the floodplain to the stream and raising groundwater levels. How does this change in floodplain connectivity and groundwater levels impact metrics such as tree survivability, shading, and riparian ecology?

Ultimately, we want to use this research to invest in tree plantings that optimize plant survival, shading/canopy goals, water quality goals, habitat goals, and community benefits, including equitable tree program delivery. We recognize there are many factors to consider, including time, in your experimental design.

*Equity has been defined by various entities over the years and continues to be updated. For your reference the EPA defines environmental equity as "providing appropriate support to remove environmental disparities, which may include addressing systemic barriers."

**The Pooled Monitoring Initiative detailed "invasives" as a "resource trade-off in different types of restoration projects" in the FY 22 RFP where the project addressing this trade-off was supported (Virginia Tech led and project titled, "Identifying restoration practices and landscape variables that increase native plant establishment and mitigate plant invasion"). The FY 22 RFP "invasives" question is at https://cbtrust.org/wp-content/uploads/Pooled-Monitoring-Initiatives-Restoration-Research-RFP_111021-1.pdf (Q6) and invasives are a topic of interest.

- Stream restoration projects with tree removal: A recent Science and Technical Advisory Committee defined stream restoration as "an intervention to move a degraded ecosystem to a trajectory of recovery as informed by a reference condition considering local and global environmental change." To date, many stream restoration practices in wooded areas, result in tree removal at the site for reasons such as: 1) construction site access; 2) for various methods of stream restoration in nontidal forested wetlands; 3) to accomplish legacy sediment removal; and 4) trees, even when remaining after restoration, may experience mortality due to changes in hydrology leading to higher water levels/inundation.

  What is the water quality and habitat cost of tree removal of certain practices compared to the benefit of the other elements of the restoration practice (e.g., elements to consider include TN, TP, and TSS loads reduced and water quality criteria such as temperature, pH, conductivity, etc.)? Funders are interested in temporal changes over time.

- Equipment trade-offs: Often to implement restoration projects, some disturbance/negative impact is incurred during construction for access purposes and other construction activities. It has been suggested that using smaller equipment to construct stream restoration projects would lead to less impact (e.g., soil compaction and/or tree loss). However, using smaller equipment could result in the need for more disturbance (e.g., a great number of trips, more individual pieces of equipment, etc.) that could have a bigger impact due to construction. We are looking for a modeling exercise that

would compare, for a hypothetical stream restoration project of a given size, the negative impacts of construction activities that used large vs. small construction equipment.

- Living shorelines: Living shorelines are often designed with goals to reduce erosion; protect land; address risk from coastal storm damage (e.g., wave and flood protection); enhance habitat (e.g., fish and other wildlife, plants); and remove nutrients and sediment. Generally, living shoreline designs require more cross-shore space compared to shoreline armor projects, given that intertidal wetland vegetation must extend either into the subtidal or riparian zones. The design footprint (area) influences the effectiveness of the project from a habitat, nutrient, and erosion control perspective. There is a need to better understand resource tradeoffs associated with living shoreline designs, including how to evaluate and balance impacts to valuable upland and shallow water habitat. Additionally, it remains unclear how resiliency is considered in designs and what timeline is appropriate, particularly where there are resource tradeoff concerns. Finally, regulators want to use this research to better quantify the conversion (i.e., changes to function/service) of shallow water habitat to low and high marsh habitat and identify parameters/thresholds for success and/or failure.
  - Funders are interested to know if and to what extent living shorelines achieve their stated goals and ask the following questions: Are there conditions in which living shorelines can improve resilience to flooding, especially where landscape position and elevations are low? Do living shoreline projects enhance habitat in high energy systems for as long as they persist, or what are the tradeoff value(s) if the wetlands cannot be effectively maintained?
  - Funders are interested to better understand impacts to upland and aquatic functions/services associated with the placement of living shorelines and ask the following questions: How do different living shoreline design approaches and landscape position affect living shoreline co-benefits: flooding abatement, habitat enhancement, nutrient reduction, shoreline stabilization, invasive species (e.g., *Phragmites*) colonization, etc.? Where there is a need to balance impacts to shallow water and critical area resources, does a living shoreline design that incorporates upland habitat (i.e., marsh migration corridor) address stated project goals compared to designs that do not and if it does, what factors were important to consider?
  - Funders are interested to know how and to what extent submerged aquatic vegetation (SAV) responds to different living shoreline techniques and ask the following questions: What are the impacts to SAV from placement of living shorelines, including direct and indirect impacts? Under what conditions are SAV likely to recover post-construction (i.e., what design techniques provide opportunity for SAV re-establishment either through replanting efforts or passive recovery)?

    Previous living shoreline research: Note that an earlier project titled, "Long-term impacts of living shorelines to Sub Aquatic Vegetation (SAV) habitats in the Chesapeake Bay" (available at: https://cbtrust.org/wp-content/uploads/Long-term-impacts-of-living-shorelines-to-SAV-habitats-in-Chesapeake-Bay_UMCES_March-2022.pdf) addressed the trade-off for SAV and living shorelines, and while more research on this specific area of SAV-living shoreline interaction is of interest to funders, we shift focus this year to a more general efficacy topic.

Potential sites to study: The Maryland Department of Natural Resources is actively monitoring living shorelines with pre-restoration data at several sites. This monitoring includes assessments of vegetation, elevation surveys, and soil nutrient/carbon composition. We encourage applicants to reach out to the program managers if interested in including these sites in your study. The Chesapeake Bay Trust and other Pooled Monitoring Advisory members also have sites available for study.

This research should allow restoration practitioners and permitters to more accurately calculate the resource's functional uplift at a particular site in order to optimize system functions in decision making.

Resources to Support Proposal Development

Current Research

Forty-four projects focusing on these and related research questions were funded over the past ten years. To become acquainted with the scope of ongoing work, forge partnerships, and avoid duplication of effort, visit https://cbtrust.org/grants/restoration-research/ and see the "Awarded Projects and Final Products" section.

Restoration Project Sites

Given budget constraints, investigators are encouraged to couple efforts with planned or completed restoration projects where appropriate. The Trust and collaborators will work to provide project sites and/or list(s) of relevant restoration projects for your project. Reach out to this program's point of contact listed above for assistance.

Proposal Narrative Format

All proposals shall be organized as follows:

- I. Introduction and Literature Review: Begin with a short review of the literature to support the research direction and methodology chosen.
- II. Hypothesis Section: Clearly identify the research question addressed and specific hypothesis to be tested. Hypotheses proposed must be directly linked to one or more of the RFP research questions.
- III. Methods – Data Collection: Contain a **robust and scientifically defensible methods section**, including:
    - A narrative describing the experimental design and justification of sample size to be used given existing spatial/temporal variability (power analysis highly encouraged for relevant studies).
    - A tabular or graphical depiction of the experimental design – **provide reviewers with a picture of exactly what the experimental design is that you are proposing**; unknown or unclear experimental designs will not be funded. Reviewers will include technical experts in your field; however, members of the management and regulatory communities who are not necessarily scientific experts in your specific field will also evaluate your proposal (see Application Review Process section below).
    - Quality Assurance Project Plan (QAPP) for the project.
- IV. Methods – Data Analysis: Describe your data analysis methodology, including identification of statistical tests to be used. Data analysis will be included in the Quality Assurance Project Plan (QAPP) for the project. Note that statisticians are included on the review panel.
- V. Work Products: Conclude with a section describing the products of the work, at a minimum to include:
    - Annual presentation(s) to the regulatory community at the annual June Pooled Monitoring Initiative's Restoration Research Forum (if invited) and additional regulatory training events for the duration of the study period as appropriate;
    - A talk at a restoration conference for the practitioner audience;
    - A final report and fact sheet; and
    - At least one scientific paper in the peer-reviewed scientific literature.

Reviewers will carefully consider how clearly the hypothesis, methods, and analysis approaches were crafted.

Application Review Process

Each proposal is reviewed and scored by technical expert peer reviewers based on the criteria below. Peer review scores are discussed by a Review Panel composed of both technical and management/regulatory experts who will consider the input of the technical expert reviewers as well as the value of the work to the management, regulatory, and practitioner communities. The review panel then recommends a suite of applications to the Trust's Board of Trustees.

Because both technical and non-technical reviewers will consider your proposal during this two-phased review process, your proposal must be both robust enough scientifically to be attractive to the technical reviewers and well-explained enough to be clear to non-experts in your field.

Applications will be disseminated for peer review between January 27 and February 17, 2025. By February 20, 2025, applicants may be provided with a set of questions from the first round of proposal review. Applicants must make a representative available to answer reviewer questions for one hour on a date to be determined between April 14 to April 18, 2025. These dates and times are subject to change with any updates provided by email to applicants and/or posted to the award program website.

The Trust and funding partners reserve the right to fund projects and budget items that advance its mission and meet its specific funding priorities and criteria.

To allow applicants to set expectations prior to investing time in application, the Trust provides historical application approval rates for the same or similar programs: The average approval rate from the last ten rounds in this award program is 30%, including both fully and partially funded applications.

Evaluation Criteria

The following criteria will be used to evaluate applications:

- Robust Methods and Statistics (Scale of 1 to 20): Use of scientifically robust methods, including sampling regimes and parameters, and statistical analysis appropriate to address the proposed hypothesis. Your tabular or visual depiction of the experimental design will be evaluated for clarity and efficacy. For projects that require site availability or data availability, evidence that such availability exists will be considered in this criterion. Sites that are well-vetted, appropriate for the experimental design, and articulated in the application are preferred.
- Qualifications (Scale of 1 to 10): Organization, lead staff, and contractors (if used) qualifications.
- Usefulness of the Anticipated Result to the Target Audience (Scale of 1 to 10): Transferability of the results to key audiences, such as regulators, restoration implementers (e.g., local governments), and restoration practitioners.
- Cost Effectiveness/Budget (Scale of 1 to 15): Budget line items and associated costs per line item must: a) support the scope of work that will answer the research question(s) and b) be appropriate and cost-effective. Reviewers will evaluate whether procurement guidelines are appropriate for the funding source(s), e.g., contractual work should be secured by attaining at least three estimates or by using a competitive bid process. Cash and in-kind match are not required, but leveraging funds to make a research plan more robust can result in higher scores.

Eligible Applicants

Both not-for-profit entities (academic institutions, non-profit organizations) and for-profit entities are permitted to apply. The strongest proposals will show committed partnerships with various types of organizations. Organizations need not be based in Maryland, but the work must be relevant to Maryland's restoration, regulatory, and/or practitioner communities since many funders are based in this state.

Funding Availability and Timeline

Funding partners have allocated an estimated just over $1,800,000 for this research program. Of the available funding, the funding partners have at least: 1) $617,750 to support Question 1, BMP Effectiveness Monitoring; 2) $373,947 to support Question 2, Watershed Restoration Assessment/Q3, Biological Community Restoration; and 3) $38,262 to support Question 5a, bacteria and chloride as priority areas of research from Maryland MS4 permittee funders. There is also at least $300,000 available funding to support the social science research Questions 6 and 7 from US EPA CBPO.

Project timeframe and funding requests are not set, and the research project funding request and timeline should correspond with the goals of the project.

Ineligible Budget Items

The following cannot be funded:

- Endowments, deficit financing, building programs, or venture capital
- Food and beverages
- Mitigation activities
- Political lobbying
- Reimbursement for a project that has been completed or materials that have been purchased

Requirements of Awardees

By submitting an application to this program, applicants acknowledge that if selected for an award, they:

- Will hold a kickoff meeting with funders to discuss reviewer feedback, make any scope adjustments, and ensure highest likelihood of usefulness of the work to the management, regulatory, and practitioner communities;
- Will submit quarterly status through the course of the project (due by 1/15, 4/15, 7/15, and 10/15) and will submit a final report;
- Will develop a summary of the research in a fact sheet (or similar approved by the Trust) for the two target audiences of regulators (primary audience) and practitioners; the fact sheet template will be provided by the Trust;
- Will disseminate research results for the annual (June forum) presentations to the regulatory community (regulators/policy makers), if invited (i.e., one per year during the award period as well as the year immediately following the award period upon conclusion of the work);
- Will provide the Trust with any data collected as part of this award and will commit to submit one or more publications as a result of the work to a peer reviewed scientific journal. The timeframe for data delivery and journal submission may be up to one year from the completion and may be made publicly available for use;

- Will have and maintain contractor liability insurance in full force and effect during the term of the contract usual and customary amounts of liability insurance coverage in connection with the performance or failure to perform services under the contract;
- Are and will be compliant with federal employment and non-discrimination laws; and
- Have not been debarred, convicted, charged or had a civil judgment rendered against them for fraud or related offense by any government agency (federal, state, or local) or been terminated for cause or default by any government agency (federal, state, or local).

Deadline

Applications must be submitted in the **Chesapeake Bay Trust Online System** by **4:00 PM EST on January 23, 2025**. Late applications will not be accepted, and the online funding opportunity will close automatically and promptly at 4:00 PM EST. Applicants are strongly encouraged to submit at least a few days prior to the deadline given the potential for high website traffic on the due date. The Trust cannot guarantee the availability of technical assistance for our online system on the deadline date.

Awards and Notifications

All applicants will receive an emailed letter stating the funding partnership's decision. An application may be declined, partially awarded, or fully awarded. The Trust and funding partners may request changes to the experimental design based on reviewer feedback and/or that applicants include additional collaboration with other applicants prior to receiving the award.

Award Process: If approved, the Trust will send a contract with award conditions and due dates of status and final reports. In the agreement, awardees will agree to the terms in the Requirements of Awardees section. The Trust uses an online system for the application process, and if awarded, project management. In addition, all final products will be provided to the funding partners for use and distribution at the sole discretion of the funding partners.

If awarded and the Project Leader changes organizations and is considered essential to the project work, the award can be transferred to the new organization to continue and complete the project work.
In cases in which the awardee fails to submit a status report or final report by the due date, the Trust reserves the right to terminate the agreement. During the project term awardees will submit status reports and products/milestones outlined in the contract (e.g., deliverables). Organizations with outstanding status or final reports will not receive additional awards.

The FY 2025 Pooled Monitoring Initiative's Restoration Research awards will be announced in June 2025.

Introduction to the Chesapeake Bay Trust

The Chesapeake Bay Trust (Trust) is a nonprofit, award-making organization dedicated to improving the bays, streams, rivers, forests, parks, and other natural resources of our local systems, from the Chesapeake to the Coastal Bays to the Youghiogheny River. The Trust, supported in large part by Maryland's Chesapeake Bay License Plate and partnerships with other regional funders, engages and empowers diverse groups to take actions that enrich natural resources and local communities of the Chesapeake Bay region. Since 1985, the Trust has awarded over $190 million in awards to municipalities, nonprofit organizations, schools, and public agencies throughout the Chesapeake Bay watershed.

The Trust is committed to the advancement of diversity and inclusion in its award-making and environmental work. As a result, the Trust strongly encourages applications directly from underrepresented groups, and for

projects that increase awareness and participation of communities that are traditionally underrepresented, such as communities of color. For a full description of the Trust's efforts to engage under-engaged groups, see our strategic plan at www.cbtrust.org/strategic-plan and https://cbtrust.org/diversity-inclusion/.

Contact

For technical assistance contact Sadie Drescher at (410) 974-2941 ext. 105, sdrescher@cbtrust.org and/or Scott Lopez (410) 974-2941 ext. 138; slopez@cbtrust.org.

Narrative Questions

Answer the project narrative questions and upload the MS Word or PDF file. The project narrative should not exceed ten (10) pages of text. We recommend that you copy and paste the questions to use as an outline in the project narrative to demonstrate that the narrative addresses all questions. You may add photos/graphs, resumes, Letter(s) of Commitment, and other materials to support your project proposal in addition to the Project Narrative questions and submitted as one file (i.e., combine the Project Narrative answers with additional materials excluding the budget for submission). There is a file attachment limit of 1 gig for the entire application.

Project Narrative – Answer the following questions in your proposal:

1. Key Restoration Question(s): Articulate the key restoration question(s) your project will address. Reference the research question number(s) listed in the RFP.

2. Introduction and Literature Review: Begin with a short review of the literature to support the research direction and methodology chosen. Discuss the background of the hypothesis you will be testing, including other relevant studies (peer-reviewed and gray literature) and their findings. How does your work build on previous activities? How does your proposed project advance the knowledge to the next level?

3. Hypothesis Section: Clearly identify the specific hypothesis to be tested. Hypotheses proposed must be directly linked to one or more of the RFP research question(s). Because both technical and non-technical reviewers will be evaluating your proposal, we recommend you present your hypotheses in graphical/schematic form (i.e., illustrate the hypothesized result you expect to see from your work).

4. Methods – Data Collection and Summary of Finding(s): Provide **robust and scientifically defensible methods section**, including:
    a) A narrative describing the experimental design and justification of sample size to be used given existing spatial/temporal variability (power analysis highly encouraged for relevant studies). Identify sampling sites (if applicable), sampling regime (if applicable), and parameters measured. Your methods must be clear and justified to answer the research question(s).
    b) A tabular or visual depiction of the experimental design. Remember again that two types of reviewers will be evaluating your proposal, and an illustration can be an effective and efficient way to ensure that all reviewers clearly understand your project goals.

5. Methods – Data Analysis: Describe your data analysis methodology, including identification of statistical tests to be used. Note that statisticians are included on the review panel.

6. Quality Assurance Project Plan (QAPP): Do you anticipate your project requiring a Quality Assurance Project Plan (Y/N)? If Yes, add this to the scope, deliverables, and budget. If No, justify this response.
    a) General guidance on QAPP's can be found on the EPA QAPP website: https://www.epa.gov/osa/elements-quality-assurance-project-plan-qapp-collecting-identifying-and-evaluating-existing.
    b) If your award is supported with federal funds the QAPP should be approved by EPA.

7. Work Products: List the products of the work with a short description of each product, at a minimum to include:
    a) A final report and fact sheet;
        i. Describe the anticipated outcomes and broader impacts/use for the findings to the audience(s) who asked the question(s) from the two target audiences of regulators (primary audience) and practitioners.
    b) Annual (June forum) presentations to the regulatory community, if invited, for the duration of the study period;
    c) A talk at a restoration conference for the practitioner audience; and
    d) At least one scientific paper in the peer-reviewed scientific literature (submission may be up to one year from project completion).

    Also, provide a statement that data collected as part of this award will be provided to the Trust as described earlier.

8. Deliverables: Provide the deliverables schedule using the table format below and include details for the deliverable format (e.g., excel spreadsheet). A template is provided for the first deliverable. Add rows for additional deliverables. Awards will be managed as firm-fixed-price contracts and this table will be used to develop the contract deliverables schedule.

Table X. Project deliverables and timeline.			
Report # and Reporting Period	**Project Deliverables**	**Date of Delivery**	**Amount**
Report #1: X/X/20XX to X/X/20XX	The deliverables are: • (add deliverables here)	X/X/20XX	$

9. Requesting Organization and Qualifications: Briefly describe your organization. Describe the experience of your organization, the staff selected in your organization to perform this work, and the contractors selected to perform this work. Resumes may be added to the application package and will not be considered in this proposal narrative's ten-page limit.

10. Contractual Work:
    a) Will contractors be used in this project (Y/N)?

    b) If yes and contractual work is >$10k, describe how you will or have met the below criteria for contractual work as described in the list below (i through v, whichever is appropriate for your project).

If contractors are expected to be retained for the proposed project, the process to select contractors for the project must be or must have been used as follows:

i. For work >$10k and <$250k you must either i) get three estimates and show good faith efforts to reach MBE/WBE/DBE firms or ii) put the work out for competitive bid (e.g., in a RFP) and make sure you did and can document you did good faith efforts.
ii. For work >$250k you must put the work out for competitive bid and during that process make sure you did and can document your good faith efforts to reach MBE/WBE/DBE firms.
iii. If the contractor/consultant has already been identified through a competitive bid process, describe the bid process used to obtain bids, including length of time the bid was open for responses, a description of the selection process/criteria used to select the winning bidder (e.g., low bidder, qualifications, criteria, etc.), and reason(s) for selection of the winning contractor (lowest qualified bid, etc.).
iv. If the contractor/consultant has not already been identified, describe the competitive bid process to be used to procure consultants including length of time the bid was open for responses, a description of the selection process/criteria used to select the winning bidder (e.g., low bidder, qualifications, criteria, etc.), and reason(s) for selection of the winning contractor (lowest qualified bid, etc.).
v. If the contractor/consultant has already been identified because the contractor was already on retainer describe the competitive process used to place the contractor on retainer and how this process met the good faith efforts to reach MBE/WBE/DBE firms.

This funding opportunity includes federal funding for Questions 6 and 7. Therefore, to be eligible for the federal funds your project must follow procurement requirements in Title 2 Code of Federal Regulations (CFR) 200. An organization proposed to receive funds other than the applicant organization is a contractor.

11. Transferability: Explain how you plan to disseminate the information (above and beyond the required participation in regulatory/policy-maker workshops described earlier).

12. Regulatory Support: If your project requires implementation of restoration work for data collection, describe the status of any permits.

13. Conflict of Interest: Projects in which there is independence between the lead investigator(s) and other phases of the project (e.g., design, build, monitor, maintain, etc.) will be ranked highest. Independence is defined as lack of involvement of the investigator(s) proposed here and the design or construction of the project(s) to be used to answer the questions in this study. Describe any connections your project team has with the design, construction, and/or funding of the restoration project(s) that could impact *or be perceived to impact* the results and their use.

Budget Instructions

Financial Management Spreadsheet – Application Budget Upload

You will be asked to upload your budget using the "Application Budget" worksheet of the Chesapeake Bay Trust's **Financial Management Spreadsheet** (FMS), an excel file template. The template can be found by visiting https://cbtrust.org/grants/applicant-resources-forms-policies/ where you can also watch a video with instructions on how to complete the FMS.

Financial Management Spreadsheet – Application Budget Information

This online application component will ask you to enter budget category and request totals. These totals will be automatically calculated in the FMS Application Budget, so you will only need to copy and paste the values from the FMS to the Online Application.

Additional Budget Justification

This online application component will ask you to provide a descriptive budget narrative to justify and explain costs. The body of work described in your proposal should be able to be accomplished with the resources requested in your budget. If the success of the work is contingent upon award of other funds, make this clear in your budget justification section.

If you have any questions about the budget, including how best to meet the cost effectiveness/budget evaluation criteria, reach out to the Trust's point of contact for this RFP.

Online Application Submission Instructions

The Trust uses an online system for the application process, and if awarded, project management. To apply for an award, go to https://cbtrust.org/grants/restoration-research/ and click on "Get Started" to begin a new application. This will open a new window asking you to log in or create an account on our online system. If you have applied in the past, use your existing username and password (if you have forgotten either of these use the 'forgot password' feature). If you have not used our online system before, click on "New Applicant" and follow the instructions.

Applicants must submit applications in the **Chesapeake Bay Trust Online System** by **4:00 pm (EST) on January 23, 2025.** Late applications will not be accepted, and the online funding opportunity will close promptly at 4:00 PM (EST).

Watch our video on how to apply for and submit an application using our online system at https://cbtrust.org/grants/.

Online Application Form

You will be asked to provide the following information on the online application form. Some items are required in order to submit your application. Refer to the online application for details.

- Eligibility Quiz
    - This three-question quiz is meant to assist you in determining if your project meets the requirements of this award program and that your staff/organizational structure best supports a successful application.

- Applicant Information Tab
    - Provide the organization's name, mailing address, phone number, organization type, mission, Employer Identification Number (EIN) number, SAM Unique Entity Identifier (UEI) number, and if a MBE/DBE add certification number and state(s).
    - Provide the Executive Officer and Project Leader's name, title, address, phone, and email address.
        - Both an Executive Officer and a Project Leader, two separate individuals, must be identified for all applications.
        - The Executive Officer and Project Leader must both be able to make decisions on behalf of the organization either as a board member, an employee, or other approved position recognized by the organization but not a contractor of the application.
        - The Executive Officer is the individual that oversees the organization (e.g., Executive Director, Chief Executive Officer, Mayor, President or Vice President, Principal (for

schools), etc.) and has the authority to sign/execute award agreements on behalf of the organization. The Executive Officer information is tied directly to all the organization's applications and should not vary from application to application. If the Executive Officer could be listed as the Project Leader in a future proposal, we recommend listing a Board Member or other higher-ranking position of the organization as the Executive Officer in order to reduce the variation in the Executive Officer across applications.

  - The Project Leader will be responsible for all project coordination and correspondence with the Trust for the duration of the project. The email address entered here MUST be the same as the email address you used to log in to the online system. The Project Leader is the primary point of contact for the application, and the email address used to submit the application via the online system must be that of the Project Leader. Applications in which the email address associated with the Project Leader in the applicant information tab of the online opportunity does not match the email address used to submit the application will not be considered for funding. The Trust cannot conduct any official correspondence with contractors or other project partners.
  - If at any time the Project Leader cannot continue in the position, the organization must contact the Trust and assign a new qualified Project Leader. If awarded and the Project Leader changes organizations and is considered essential to the project work, the award can be transferred to that organization to continue and complete the project work.

- Project Information Tab
  - Provide a project title; project abstract (include the research question(s) to be addressed, hypothesis to be tested, and a summary of the project); the watershed, county, and legislative district in which the project is located; and the latitude and longitude coordinates of the project location.

- Timeline Tab
  - Add the project start and end date. Provide a project timeline that includes major tasks and their associated start and end dates.

- Deliverables Tab
  - Provide estimated metrics for your proposed project. Disregard deliverables that do not apply to your project.

- Project Partnerships
  - Provide a list of project partner organizations or contractors, individuals, their areas of expertise, and their role(s) in your project. An organization proposed to receive funds other than the applicant organization is a contractor.
  - Applicants are encouraged to upload a Letter of Commitment for the project from each partner describing in detail the partner's role or contribution to the project. Applications including strong Letter(s) of Commitment often receive higher scores. If not submitted with the application, Letter(s) of Commitment may be required prior to the release of any awarded funding. To better understand the Trust's definition of and policy on Letter(s) of Commitment, visit our Forms and Policies webpage: https://cbtrust.org/grants/applicant-resources-forms-policies/.

- Narrative & Supporting Documents Tab
  - Upload a Microsoft Word or PDF file that contains your answers to the narrative questions found in the Narrative Questions section of this RFP. Upload additional supporting documents, if

needed/required.

- Budget Tab
    - Upload your application budget, provide budget category and request totals, and provide additional budget justification. Use the Trust's Financial Management Spreadsheet and fill out the "Application Budget" worksheet. Refer to the Budget Instructions of this RFP.

- Terms and Conditions Tab
    - Agree to the specified terms and conditions for the program for which you are applying.

- Demographics Tab and Survey Tab (optional): Provide voluntary demographic information. Provide information about your organization's current diversity, equity, inclusion, and justice (DEIJ) efforts and future goals. Additionally, provide voluntary feedback on the application process.