Project title: University Collaboration to Support Expert Review of Best Management Practices for Chesapeake Bay Water Quality Improvements

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Introduction

This proposal, which was developed in response to the EPA RFP number EPA-R3-CBP-13-03, outlines how faculty and staff from Virginia Tech, with support from colleagues from other Chesapeake Bay region universities, can assist the Chesapeake Bay Program (CBP) Partnership in developing sound, defensible BMP performance estimates and modeling approaches. This proposal also addresses how a consortium of universities engaged in assessing BMP performance can contribute to improving the CBP Partnership's evolving BMP verification framework.

The CBP Partnership seeks external expertise to provide technical advice on a range of issues through the structure of its Goal Implementation Teams (GITs) and associated workgroups and the Scientific Technical Assessment and Reporting (STAR) committee. The tracking, verification, reporting, and subsequent model-based quantification of the estimated pollutant-load reduction potential of each implemented practice, treatment, and technology (hereafter generalized as "BMP") is used by the CBP Partnership as one of several principal means of accounting for implementation progress towards water quality goals. The CBP Partnership uses these land use-based nutrient and sediment loading estimates and/or BMP pollutant reduction effectiveness estimates to quantify nonpoint source loads to local streams, rivers, groundwater, and the Bay. The pollutant load reductions of each of these new and existing BMPs should be developed based on the best available scientific and technical information for approval and use by the CBP Partnership to improve consistency, model defensibility, and stakeholder buy-in.

Objectives

1. Implement BMP protocol: Effectively and efficiently manage the CBP partnership's process of developing or revising nutrient and sediment load reduction values or efficiencies for new or existing BMPs or other pollutant load reduction or prevention treatments and technologies that have been, or potentially could be, implemented within the Chesapeake Bay watershed.

2. Assist expert panels with verification role: Support the CBP Partnership as BMP verification policies and procedures evolve.

3. Convene expert panels for modeling topics: Assist the CBP Partnership in developing recommendations for how to address and implement watershed and water quality modeling innovations.

Approach

Objective 1: Implement BMP protocol

We will implement the "BMP Protocol" that was adopted by the Chesapeake Bay Water Quality Goal Implementation Team (WQGIT) in 2010 (http://archive.chesapeakebay.net/pubs/Nutrient-Sediment_Control_Review_Protocol.pdf) to achieve Objective 1. The current BMP protocol specifies that, at the behest of the WQGIT and the relevant Workgroup, expert panels be convened and tasked with developing BMP performance efficiency estimates. The BMP expert panels (EP) are expected to base their performance recommendations on data gleaned from available, relevant literature (peer-reviewed and gray), practical considerations of BMP performance under 'real world' conditions, and considerations about how each BMP is represented within the CBWM.

Under the current BMP Protocol, each EP is to be comprised of at least six individuals at a minimum: three recognized topic experts and three individuals with expertise in environmental and water quality-related issues. Each EP is also expected to include appropriate geographic representation. The time commitment required to serve on an EP can be significant. In the past, many EPs have been active for 12 to 15 months or more and may involve participating in numerous conference calls, and perhaps face-to-face meetings. Typically the experts that serve on EPs have not been compensated. While the current process of recruiting EP participation and managing the EPs has been somewhat successful, we propose to incentivize the management of, and potentially participation in, the EP process. Providing a participation incentive will improve process efficiency.

We propose to execute a process by which experts interested in chairing an EP would apply for funding to support the EP process. Under the proposed arrangement, EP funding applications would be competitive, and would require an independent entity external to the CBP to be responsible for evaluating the EP funding applications. We propose that entity to be a group of academics who compose the newly created Chesapeake Bay Watershed Research and Outreach Collaborative (CBW-ROC).

CBW-ROC seeks to leverage the university network that comprised the Mid-Atlantic Water Program. During its tenure (2002 – 2013), the Mid-Atlantic Water Program (MAWP) successfully addressed major water quality issues in a uniquely regional way (http://www.mawaterquality.org/). The MAWP created a forum for interstate, interdisciplinary collaboration guided by the mission to improve water quality by creating and disseminating science-based knowledge that facilitated change in environmental management and policy, industry practice, and individual behavior. The core of the new CBW-ROC team includes many of the same individuals and universities that were involved in the MAWP. We propose to use the CBW-ROC Advisory Board as the EP proposal review panel mentioned previously. In the near future, the CBW-ROC Advisory Board will reach out to other universities in the region that were not part of the MAWP, to ensure that both public and private institutions located within the Bay jurisdictions are part of CBW-ROC. To ensure a regular flow of new ideas and perspectives, as CBW-ROC membership expands and evolves, the Advisory Board chair will rotate with each Chair serving a two year term.

Under our proposal, as requests for BMP evaluations are made to the WQGIT, the WQGIT Chair would work with Project Lead (Benham) and the project's Project Coordinator (TBD) to develop an EP request for proposals (RFP). The EP RFP would solicit brief (3 pages max) proposals that specify: 1) who will chair the EP, 2) the other experts that will participate in the EP and their qualifications, and 3) how the requested funds will be used to develop the EP recommendations and produce the EP deliverable (i.e., a report that adheres in form and content to the outline specified in the BMP Protocol). EP proposals, which will be required to conform to a specific template, will be evaluated by the CBW-ROC Advisory Board. The project lead (Benham) will be responsible for coordinating funding with the successful applicant. Available funding is anticipated to range from $25,000 to $50,000 per EP depending on the complexity of a given BMP. The amount of funding available for each EP RFP will be jointly determined by the Project Lead and the WQGIT Chair, with input from the CBW-ROC Advisory Board and the appropriate Workgroup Chair and Coordinator. Potential uses for the funding awarded to the EP Chair could include compensation for a portion of the EP Chair's time through salary compensation, funding technically competent support persons (e.g., post-docs or advanced graduate students) to assist the EP Chair in performing literature reviews and synthesizing, summarizing and evaluating resource materials that the EP will use when developing their BMP efficiency and performance recommendations, or compensating EP members for a portion of their time, effort, or relevant travel expenses.

Ensuring that the proposed BMP EP process operates in a timely and efficient manner as designed will be the responsibility of the Project Lead (Benham) and full-time Project Coordinator (TBD). With a full-time staff person dedicated to the coordination of EPs, the timeframe for EPs completing their work will be greatly reduced. The proposed process will also require the active involvement of the CBW-ROC Advisory Board and the CBP Partnership.

Objective 2: Assist expert panels with verification role
The CBP BMP Verification Committee is charged with "developing all the elements of a basin-wide BMP verification framework —BMP verification principles, protocols, review panels, and other verification-related procedures (e.g., eliminating double counting, cleanup of historical databases)— working in tandem with the CBP Partnership's pollutant source sector and habitat restoration workgroups." As it currently exists, the BMP verification framework includes a set of five verification principles to which the framework must adhere, draft verification protocols and protocol development guidance documents that have been produced by the GITs and their respective workgroups, and an independent verification review panel that is tasked with advising the CBP on the evolution of the verification framework. *Within the bounds of this proposal, the role of the Project Lead and the Project Coordinator will be limited to assisting the various EPs convened under Objective 1 in developing options for performing BMP-specific verification.* We will educate the EPs membership about the scope and purpose of the CBP verification process and, as a part of managing the EPs, we will ensure that each EP final report will include suggestions on how verification for each BMP can be accomplished (e.g., data needed to document verification, frequency of data collection).

Objective 3: Convene expert panels for modeling topics
The CBP's planned 2017 mid-point assessment will likely require expert input on a range of emerging issues beyond defining BMPs and determining estimates for performance efficiencies. *Objective 3 seeks to provide the CBP with support for soliciting expert input on selected emerging modeling-related issues.* Examples of potential issues that have already been identified by the CBP include: accounting for the potential consequences of population growth and continuing change, factoring in a new understanding of the Susquehanna River dams' influence on pollutant loads, understanding and recognizing annual variability of rainfall-driven pollutant loads. To provide the needed EP support, we propose to follow the same basic process presented for Objective 1. The primary difference will be that in addition to working with the WQGIT and its various workgroups, under Objective 3 the Project Lead and the Project Coordinator will work closely with the Scientific, Technical Assessment and Reporting (STAR) team's Modeling Workgroup to identify modeling-related topics where input and feedback using the EP process is desired or merited. The process of soliciting, reviewing, and selecting modeling-related EP proposals would occur as needed, and would be identical to that outlined for Objective 1. The number of modeling-related EPs that could be convened in a given year will depend on the number of BMP EPs that are funded under Objective 1, and the number and complexity of the modeling issues put forward by STAR's Modeling Workgroup.

Outcomes
Outcomes from this project will be both near and long-term. The most significant near-term outcome will be a more efficient and effective BMP performance evaluation process. Long-term outcomes include; 1) a more robust, mutually beneficial relationship between the CBP and the academic community as embodied by the CBW-ROC, 2) a more defensible CBWM, 3) improved practice accounting and verification procedures and protocols that are reflected in more refined and achievable jurisdictional Watershed Implementation Plans and programmatic milestones, 4) shifts in jurisdictional BMP implementation priorities based on the evaluation of management practice effectiveness, CBWM pollution loading estimates and monitoring data, and most importantly, 5) improved water quality due to more accurate representation of BMPs in the CBP models that will better inform WIPs and resulting implementation.