



Chesapeake Bay Program
SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE
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July 6, 2017

RE: STAC Optimization Workshop Report

Nicholas DiPasquale, Chair, Chesapeake Bay Program Management Board
U.S. Environmental Protection Agency
410 Severn Avenue, Suite 109
Annapolis, MD 21403

Cc: Management Board; Water Quality Goal Implementation Team; Modeling Workgroup;
Local Government Advisory Committee; Scientific Technical Assessment and Reporting
(STAR)

Dear Director DiPasquale,

Please see the attached STAC workshop report entitled, “*Cracking the WIP: Designing an Optimization Engine to Guide Efficient Bay Implementation*”. This report outlines specific recommendations identified by participants at STAC’s February 17-18, 2016 workshop with a summary of workshop proceedings.

The main goals of this workshop were to assess optimization as a potential solution to address certain challenges in the future planning for the Partnership’s 2017 Mid-point Assessment, the development of Phase III Watershed Implementation Plans (WIP) and 2018-2019 milestone planning. While the existing suite of tools through the Chesapeake Bay Program (CBP) partnership aides in the development of an implementation plan to readily accomplish load reduction goals of the total maximum daily load (TMDL), developing an adaptive plan that is equitable, minimizes costs, and takes advantage of potential co-benefits is not currently possible. Additionally, models that can identify potential strategies for efficiently advancing multiple goals and objectives of the broader Chesapeake Bay Watershed Agreement are needed. Optimization may provide decision makers with a methodology that provides solutions to the above challenges, as well as accounting for the effects of best management practices (BMPs) in variable and complex watersheds while achieving multiple goals. Therefore, the main goals of this workshop were to: 1) review the state of optimization modeling approaches (and their strengths and weaknesses), 2) examine real world applications of optimization in a water quality context, and 3) examine the capacity to integrate an optimization engine with existing tools developed by the CBP to guide WIP development.

The workshop explored alternative optimization techniques for use in potential decision-support tools to develop optimized implementation plans, recognizing that local, county, and state planning/public works agencies staff and managers would be the primary users. Workshop participants reached consensus on several key objectives of a Bay optimization system that were

applicable to the Chesapeake Bay TMDL and the broader Chesapeake Bay Watershed Agreement goals, including:

1. Minimizing total costs (capital, installation, opportunity and maintenance)
2. Maximizing co-benefits, particularly those supporting Chesapeake Bay Watershed Agreement goals
3. Maximizing load reduction reliability
4. Equitable distribution of effort among jurisdictions
5. Equitable distribution of effort among source sectors
6. Limits on retirement of agricultural land
7. Ability to use the tool at various scales (county, multi-county, segmentshed, state-basin, basin, state, baywide, basinwide)

Workshop participants synthesized the above common optimization objectives, decision variables, and constraints needed to define several detailed constructs for a Bay optimization system, specifically recommending the enhancement of our existing suite of decision-support tools. Participants agreed that the development of a Bay Optimization System should be on a timeline compatible with the Phase III WIP development process. Additionally, participants agreed that the development of a Bay optimization system should be incorporated into the Partnership's on-line Chesapeake Assessment and Scenario Tool (CAST). Recognizing the challenges of completing the full system capabilities in the proposed timeline, the participants suggested a stepwise approach, outlined in this report, to developing the Bay optimization system. The first steps have already been underway by CBPO staff over the past several months.

We hope the Management Board, Goal Implementation Teams, and various workgroups find these recommendations to be useful, and we look forward to your feedback. STAC respectfully requests a written response to the workshop findings and recommendations from the CBP Management Board Chair by October 6, 2017.

Please direct any questions you may have about this report and its recommendations to Rachel Dixon, Coordinator of the CBP's Scientific and Technical Advisory Committee, and James Davis-Martin (VA DEQ), workshop chair and chair of the Water Quality Goal Implementation Team.

On behalf of the entire STAC, thank you again for considering these recommended next steps, and we look forward to working with you closely on this in the future.

Sincerely,



Lisa Wainger
Chair, Chesapeake Bay Program's Scientific and Technical Advisory Committee