



Chesapeake Bay Program
SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE
645 Contees Wharf Road, P.O. Box 28, Edgewater, MD 21037
Phone: (410)798-1283 Fax: (410)798-0816
<http://www.chesapeake.org/stac/>

April 16, 2019

RE: STAC 'Chesapeake Bay Program Modeling in 2025 and Beyond' Workshop Report

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

Cc: Management Board; Scientific Technical Assessment and Reporting (STAR); Modeling Workgroup

Dear Director Aunkst,

Please see the attached report entitled, "*Chesapeake Bay Program Modeling in 2025 and Beyond: A Proactive Visioning Workshop*". This report provides a summary of the proceedings of a three-day STAC-sponsored workshop convened January 17-19, 2018 and outlines specific recommendations identified by participants.

The Chesapeake Bay Program modeling system, a planning tool to inform strategic management decisions and adaptation toward Bay restoration, has been continually updated to keep pace with emerging science. It has been more than a decade since STAC last convened a dedicated workshop to discuss future directions for the suite of modeling tools. Given significant developments in recent years and the completion of the 2017 Mid-point Assessment of the TMDL, the objective of this workshop was to formulate a vision for future CBP modeling to guide the partnership into the future (i.e., post-2025, 'Phase 7'). The workshop brought together expertise and ideas in (1) alternative integrative modeling approaches, (2) multiple and ensemble modeling, (3) shallow water modeling, (4) uncertainty assessment, (5) open source and community modeling, (6) stakeholder engagement and social science, (7) modular modeling approaches, and (8) CBP management needs.

The enclosed report presents the conclusions of workshop experts on how to evolve the Phase 6 modeling system for TMDL development in 2025 and beyond and specific guidance that emerged from targeted breakout group discussions on how to realize this vision for future CBP modeling. Key findings from the workshop include:

1. The review and feedback of the CBP models by STAC, the Modeling Workgroup, and the Water Quality GIT works and should continue with future iterations. Continued feedback from federal, state, and local jurisdictions to improve the models is also essential.
2. Future model development should continue to be driven by management needs and future models must support time-certain management deadlines.
3. Management decisions guided by the CBP partnership models should reflect social and economic outcomes outlined in the 2014 Watershed Agreement.
4. Modular modeling techniques should be adopted wherever possible.

5. The 2025 next generation CBP suite of models should provide support of better understanding across a wide range of scales. Specifically, the CBP partnership should expand its efforts to make its models applicable to smaller “local” scales. The models should strive to provide outputs related to local ecosystem services and economic impacts that are of direct interest to local stakeholders.
6. The CBP should continue its efforts to work toward assessing the uncertainties in its modeling suite, with particular attention to simulated responses to management actions in the context of the TMDL.
7. The CBP should continue to employ and develop the Phase 6 Watershed Model that uses multiple models to determine responses to management actions.
8. Potential future development of the hydrodynamic and biogeochemical models should focus on transition to a hydrodynamic model with an unstructured grid that can provide much greater resolution in the shallow tributaries of the Bay.
9. The current living resource simulation in the CBP water quality model, which includes submerged aquatic vegetation (SAV) and oysters, should continue to be developed with the goal of improving these models.
10. Efforts to incorporate living resources should start by using living resource models that are forced using output from the CBP partnership models – e.g., water quality parameters. The CBP estuarine water quality model should be used to help define habitat quality and impacts on higher trophic level organisms; it should have a structure that supports direct coupling with models of higher trophic level species.
11. The approaches, processes, and parameterizations used in the CBP models for estimating the impacts of climate change and sea level rise on the TMDL should be reexamined in detail.
12. The CBP should continue to work toward strengthening its ties with the scientific community and it should continue to support adaptive management.

We hope that the Management Board, Goal Implementation Teams, and various workgroups will find these recommendations 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 July 16, 2019.

Please direct any questions regarding this report and its recommendations to Rachel Dixon, Coordinator of the CBP’s Scientific and Technical Advisory Committee, or workshop chairs Raleigh Hood (rhood@umces.edu) and Gary Shenk (gshenk@chesapeakebay.net).

On behalf of the entire STAC, thank you for considering these recommended next steps, and we look forward to continuing this dialogue in the future.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Miller". The signature is fluid and cursive, with the first name being more prominent.

Andrew Miller

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