



**Chesapeake Bay Program**  
**SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE**  
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August 9, 2019

RE: STAC 'Water Clarity' Workshop Report

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

Cc: CBP Management Board; Water Quality Goal Implementation Team (GIT); Scientific Technical Assessment and Reporting (STAR)

Dear Director Aunkst,

Please see the attached report entitled, "*Understanding and Explaining 30 Years of Water Clarity Trends in the Chesapeake Bay's Tidal Waters*". This report provides a summary of the proceedings of a Science and Technical Advisory Committee (STAC) sponsored workshop on the state of the science of the controls on water clarity variability in order to expand understanding of submerged aquatic vegetation (SAV) trends, and the interactions between eutrophication, sediment inputs, and the concentrations and composition of suspended solids. This report also outlines specific recommendations identified by participants at a two-part workshop. Part I of the workshop was held on February 6-7 2017, while Part II, convened on May 2-3 2017.

This workshop's objective was to bring together experts from multiple disciplines in order to synthesize the current state of the science on water clarity trends and the factors that affect them, as well as to communicate the implications of existing insights for management and to identify priorities for future research. Although the proposal was originally submitted for a traditional STAC workshop format, the effort was reorganized into a synthesis, conducted through several phone calls and two face-to-face workshops. A subset of participants was actively engaged in analysis, while an additional group of subject-matter experts provided presentations and participated in discussions. This effort was aimed to address gaps in knowledge and to identify critical research needs for the purpose of advancing our ability to explain water clarity trends.

Lessons learned and major findings from the workshop concluded that although the current management strategy of reducing nutrient loads do largely target the drivers of poor water clarity, responses to improved management are complicated by interannual variations in fresh water runoff and by long-term changes in the properties of suspended solids. For example, a long-term shift toward an abundance of finer, organic-rich particles across much of the Bay may have made the water appear cloudier (as measured by Secchi depth) even while the amount of light reaching submerged aquatic vegetation remained steady or improved (as measured by light attenuation).

Knowledge gaps and critical recommendations from this workshop were as follows:

- 1) **Statistical modeling application:** Recent efforts in applying statistical modeling to test hypotheses need to be continued, and insights from them should be integrated with the Chesapeake community's process models.
- 2) **Sources of suspended organic matter evaluation:** The sources of suspended organic matter and its concentration relative to inorganic solids in tidally influenced waters need to be better characterized and understood, including their responses to riverine discharge and salinity.
- 3) **Comprehensive data collection:** Better data on phytoplankton biomass, microbial processing of suspended organic matter and colored dissolved organic matter (CDOM) production in estuarine environments is necessary to better understand the response of water clarity to biological processes and associated feedback mechanisms.
- 4) **Analysis of available data:** A great deal of potential remains untapped with regard to eliciting new insights from currently available data. For example, the focus to date has been more on the mid-channel long-term data. New work should include analysis of available data on shallow water properties.
- 5) **Further research on relative strengths of various drivers:** The concept of the relative strengths of different drivers across water clarity "habitats" is not an established paradigm; rather it is a set of hypotheses that need to be tested within and across environmental settings.

We hope that the Chesapeake Bay Program will find these recommendations useful, and we look forward to your feedback through a written response to the workshop findings and recommendations.

Please direct any questions regarding this report and its recommendations to Annabelle Harvey, Coordinator of the CBP's Scientific and Technical Advisory Committee, or workshop chair Jeni Keisman ([jkeisman@usgs.gov](mailto:jkeisman@usgs.gov)). 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,



Andrew Miller

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