Integrating Recent Findings to Explain Water Quality Change: Support for the Mid-Point Assessment and Beyond

STAC Responsive Workshop Proposal
February 22, 2017

Requested by:

Scientific Technical Assessment and Reporting (STAR) team

Workshop Steering Committee

Jeni Keisman, U.S. Geological Survey (workshop co-lead)
Joel Blomquist, U.S. Geological Survey (workshop co-lead)
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Additional WQGIT representative, TBD
JK Bohlke, U.S. Geological Survey [STAC Rep – Confirmed]
Carl Friedrichs, Virginia Institute of Marine Science [STAC Rep – Confirmed]
Rebecca Murphy, University of Maryland Center for Environmental Science
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Donald Weller, Smithsonian Environmental Research Center
Bill Dennison, University of Maryland Center for Environmental Science [STAC Rep – Confirmed]
Scott Phillips, U.S. Geological Survey

Need and Description of Workshop:

Several intensive efforts are underway among estuarine researchers to synthesize findings on factors affecting recent and long-term trends in: (1) station-level estuarine water quality and water clarity; (2) segment-scale water-quality standards attainment; and (3) local and regional changes in water clarity, abundance of submerged aquatic vegetation (SAV), and benthic community health. In parallel, researchers focused on the watershed are working to explain riverine water quality trends by combining information on spatial and temporal patterns in nutrient inputs, land use, and BMP implementation with information on regional differences in physiography, groundwater transit times, the biogeochemistry of groundwater flow paths, and sediment transport.

The researchers involved in these efforts share a common interest in supporting the science needs of Chesapeake Bay resource managers. At the same time, managers involved in the TMDL Mid-Point Assessment (MPA) have a pressing need for the best available science to inform development of their Phase III Watershed Implementation Plans (WIPs). Stretching beyond the MPA, they will have a continuing need for science to inform the ongoing adaptive management of the Chesapeake Bay restoration effort.

The multi-disciplinary nature of these research activities creates challenges for deriving integrated insights from the findings of individual research efforts. At the same time, the volume and complexity of emerging insights from these efforts creates a challenge for the Chesapeake Bay management community to assimilate into their decision-making processes. To help accomplish these goals, the CBP needs a focused, intensive workshop that brings researchers from each of these projects together with each other and with water quality managers to identify the key findings that can best inform development and execution of the Phase III WIPs.

The proposed STAC workshop will provide the mechanism for a focused exchange among the scientists leading the efforts to explain water-quality change and the managers working to incorporate those explanations into management of the Chesapeake Bay restoration effort. Specific goals of the workshop are to:

- Discuss major findings from the recent and ongoing science efforts described above with an emphasis on combining related elements to reveal new insights into riverine and estuarine response to watershed changes.
- Identify overlap between these insights and the information needs of water quality managers to support development of the Phase III WIPs and ongoing adaptive management of the Chesapeake Bay restoration effort.
- Identify future research directions that would meet the most pressing science needs of water quality managers, with a focus on building on the insights discussed or filling gaps not addressed by them.

The workshop format will include:

1. Summary presentations of major findings from recent research efforts to explain trends in riverine and estuarine water quality;
2. Discussions to identify complementary findings for further integration and communication;
3. Discussion of the implications for, and potential application to, development and execution of the Phase III WIPs
4. Facilitated discussion on next steps to address the most pressing science needs to support future decision-making for Chesapeake Bay restoration.

Urgency of the Workshop:

The proposed timing of the workshop (late Fall, 2017) balances the need to include insights on explaining trends in water quality that are emerging in 2017, with the need to communicate those insights for the TMDL MPA and associated development of the jurisdictions' Phase III WIPs, which are due in 2018. The insights on monitoring trends will also inform implementation of best management practices (BMPs) from 2018 through 2025. Finally, insights on gaps in ongoing research efforts can inform targeting of available research resources towards addressing managers' needs.

Questions to be Addressed During the Workshop

1. What are the key findings that have emerged from recent efforts to explain changes in nutrients and sediment in the Chesapeake Bay Watershed and their relation to estuarine water quality, SAV abundance, and benthic community health?
2. How can these findings be integrated to generate new insights on the functioning of these systems, with emphasis on implications for their management?
3. How well do the research efforts and findings discussed during the workshop align with the most pressing questions of water quality managers?
4. Where should researchers focus their efforts to address some of the highest priority science needs stretching beyond the MPA?

Workshop Outcomes

The steering committee will collaborate with workshop presenters to complete a summary workshop report that: (1) compiles the selected findings from the research efforts discussed that are of most interest to water-quality managers for WIP development as well as information needs beyond the MPA; (2) identifies complementary findings for further integration and communication of new insights to inform resource management; (3) reports workshop conclusions regarding research gaps and high priorities for building on the research findings discussed.

Targeted Workshop Participants

Participants in this workshop will include lead investigators of the research efforts described above as well as selected members from the ITAT Jurisdictional Team. The Jurisdictional Team is comprised of a subset of WQGIT members who have begun to attend monthly conference calls introducing them to recent findings from the research efforts described above. Prior exposure to the building blocks of the workshop content will help managers prepare for active engagement in workshop discussions and decision-making. Research teams are composed of anywhere from 1-3 individuals to groups of 10-15 collaborators; approximately 40 researchers are involved in these efforts overall. Approximately 15 managers from the WQGIT, representing all jurisdictions as well as the MWCOG, are involved in the ITAT jurisdiction team. A list of core participants will be generated from these two groups, and the steering committee will determine whether additional representatives from the research and management communities are needed.

Workshop Logistics, Timing, and Location

The workshop will be scheduled for late Fall 2017 so that the outcomes of the workshop can be communicated throughout the Partnership in 2018. Target participation is approximately 40-50 participants. Preferred locations for the workshop are dependent on the final number of invitees, but will likely be limited to venues that can accommodate at least 40 participants such as SERC or one of the venues commonly used for STAC meetings.

Estimated Budget

Venue: $1500, Food: $3000, Travel/lodging for speakers: $4500, Total requested: $8500

Past STAC Workshops and Peer Reviews Related to this Proposal

The March 2014 MEOWQT STAC workshop laid a foundation for the larger explaining trends work underway across the watershed and findings being generated for this proposed workshop. The recent STAC Expert Panel review of the application of Generalized Additive Models (GAMs) to quantifying and explaining trends in tidal water quality is also informing related research.

Attachment: Letter signed by Scott Phillips, and Bill Dennison. STAR co-chair

To: Chesapeake Bay Program Scientific and Technical Advisory Committee

From: Scott Philips and Bill Dennison, Co-Chairs of the Scientific and Technical Assessment and Reporting (STAR) team

Date: February 1, 2017

Subject: Submission of STAR workshop proposal

The Scientific and Technical Assessment and Reporting (STAR) team leaderships supports the acute need for the responsive workshop on "**Integrating Science on Watershed and Estuarine Change: Support for the Mid-Point Assessment and Beyond."**

Several intensive efforts are underway to better explain water-quality and submerged aquatic vegetation (SAV) trends in the Chesapeake ecosystem to support the Midpoint Assessment (MPA) of the Bay TMDL. Major efforts to explain the changes of monitoring results include studies of nutrients and sediment in the watershed and syntheses of estuarine changes including water quality and standards attainment, water clarity changes, and factors affecting SAV. The volume and complexity of emerging insights from these efforts creates a challenge for the Chesapeake Bay management community to assimilate into their decision-making processes. In addition, the science community needs to collectively reflect on these insights in order to further advance the understanding of watershed impacts on estuarine conditions. To accomplish these goals, the CBP needs a focused, intensive effort to communicate and integrate findings from different science efforts to inform development and execution of the Phase III Watershed Implementation Plans.

The proposed STAC workshop will provide the mechanism for having focused interchange between the scientists leading the efforts to explain water-quality change and with the managers who need to utilize and apply the results. The goals of the workshop are to:

- Review key findings from science efforts to explain change, to advance the long-term strategy to understand the ecosystems' response to watershed changes.
- Identify key findings supporting the MPA and the development of the Phase III WIPs.
- Identify future research directions in light of the most pressing science needs of water quality managers.

There is an urgent need to have the workshop in autumn 2017 to inform the WIPs, which are due to be completed in 2018. The Water-Quality Goal Team Chair has expressed an interest in the workshop and is willing to get additional endorsements after discussion with his team.

We appreciate you considering the proposal and are glad to address any questions.

Scott Phillips, USGS and Bill Dennison, UMCES