

Explaining Trends in Aquatic Conditions: Targeting Critical Insights and Gaps for the Next Generation of Synthesis and Application

STAC Responsive Workshop Proposal

February 16, 2018

Requested by:

CBP Scientific Technical Assessment and Reporting team (STAR)

Proposed Workshop Steering Committee

- Jeni Keisman, USGS (co-chair)
- Joel Blomquist, USGS (co-chair)
- Jeremy Testa, UMCES (confirmed)
- Kathy Boomer, TNC (STAC rep; confirmed)
- Dinorah Dalmasy, MDE (WQGIT; confirmed)
- James Davis-Martin, VADEQ (WQGIT; confirmed)
- Carl Friedrichs, VIMS (STAC rep; confirmed)
- Marjy Friedrichs, VIMS (confirmed)
- Scott Phillips, USGS (STAR rep; confirmed)
- Emily Trentacoste, EPA (confirmed)
- Qian Zhang, UMCES (confirmed)

Need and Description of Workshop

In recent years, there has been a concerted effort in the Chesapeake Bay research community to synthesize and advance our understanding of factors affecting trends in aquatic conditions of the Chesapeake Bay watershed and estuary. However, distilling complex information into key insights, as well as clarifying and prioritizing critical gaps into actionable plans, remains challenging. The proposed STAC workshop will provide a venue for a focused, disciplined exchange among scientists involved in these efforts on not only the current state of knowledge and remaining uncertainties, but also on the prioritization of research for the next cycle of synthesis to inform adaptive management.

The workshop will follow a structured format in which participants use a pre-defined template to present their findings, followed by breakout discussions focused on synergies, remaining uncertainties, and the continued adoption of advanced analytical approaches to address them. Prioritization based on the needs of the management community will be discussed. Specific goals of the workshop are:

- To foster the identification and pursuit of synergistic insights that, when combined, advance our understanding of ecosystem response to environmental and anthropogenic factors;
- To articulate and prioritize those uncertainties and gaps with the greatest potential to improve the effectiveness of management strategies;
- To accelerate the adoption of advanced analytical techniques (such as structural equation modeling, generalized additive models, and other approaches identified in the 2014 STAC MEOWQT workshop) to address these gaps.

The workshop format will include:

- Summary presentations following a pre-defined format, that describe:
 - Existing conceptual models of estuarine and watershed response to changes in land use and nutrient and sediment inputs across the Chesapeake Bay's heterogeneous landscape;

- How recent research has confirmed, informed, and/or changed our paradigm of ecosystem functioning and response to change;
- Most critical remaining uncertainties and obstacles to further understanding.
- Breakout discussions to discuss presentation content, with emphasis on complementary, contradictory, and/or synergistic insights, and relevance of insights to resource management
- Discussion of next steps to reduce those uncertainties that are most relevant to managers' decision-making

Urgency of the Workshop:

Regional environmental managers are currently engaged in a historic effort to develop and implement frameworks that will guide management of the Chesapeake Bay watershed and estuary through 2025 and beyond. Adaptation of these strategies depends not only on use of the best currently available information in the near term, but also the ability to incorporate better information as it becomes available in the future. In order to maximize their impact, it is critical for engaged scientists to hone their ability to boil complex information down to its most essential elements and to understand the relevance of this information for affecting management decisions. Furthermore, targeting the next round of research to explicitly address critical uncertainties enhances partners' understanding of the relevance of ongoing scientific inquiry to their work. Finally, the format of this workshop is based on lessons learned from the December, 2017 STAC workshop on "Integrating Recent Findings to Explain Water Quality Change: Support for the Mid-Point Assessment and Beyond." We aim to build on the interest and momentum gained at that workshop, but this time with a more focused exchange that will guide future research and synthesis directions. Research areas represented at the workshop will reflect the identified needs of managers. Example research areas identified at the December 2017 STAC workshop, which will be refined during workshop planning, include:

- Implications of groundwater residence times for detecting effects of change;
- Local co-benefits of BMP implementation;
- Reducing uncertainty of insights on critical drivers and responses;
- Impacts of sediment inputs on aquatic conditions and living resources;
- Approaches for evaluating BMP implementation before effects can be detected, such as by evaluating targeting effectiveness;
- Novel analytical approaches for linking non-point source BMPs to load reductions and estuarine response.

Questions to be Addressed During the Workshop

1. What complementary insights across the participating disciplines can be integrated to advance our understanding of how environmental setting and human activities affect watershed and estuarine conditions?
2. In what areas do conceptual models of functioning and response conflict with each other?
3. How can we apply new analytical techniques to investigate causality among variables (such as those identified in the 2014 MEOWQT workshop) to advance our understanding of factors affecting changes in aquatic conditions and ecosystem health?

Workshop Outcomes

The steering committee will collaborate with workshop presenters to:

- Identify and implement interdisciplinary synthesis of findings to inform ongoing adaptive management of the Chesapeake Bay watershed and estuary. Identification is an immediate product of the workshop and will be included in the workshop report. Implementation will be encouraged through presentations to the research community, such as CRC partners and science agencies, throughout 2019 with the goal of influencing research directions and obtaining funding in 2020 and beyond.
- Identify opportunities to apply promising analytical approaches to push the limits of our ability to explain changes in aquatic conditions. Promising approaches will be described in the workshop report, and will be part of the presentations described above.
- Integrate insights from the workshop's participating social scientists to improve use of interdisciplinary findings in restoration. Findings will be documented in the workshop report; post-workshop activities will be guided by participants' recommendations.
- Within 90 days of workshop completion, produce a STAC workshop report summarizing the workshop and providing recommendations for supporting the outcomes described above. The workshop report will include recommendations for CBP actions to foster new science activities.

Targeted Workshop Participants

The target size for this workshop is up to 30 participants, and will include the steering committee, up to 4 regional experts and/or lead investigators of the selected research areas described above, and a representative manager from each jurisdiction in the watershed to help maintain managers' needs as a component of research discussions.

Workshop Logistics, Timing, and Location

The workshop will be scheduled for January/February 2019. This timing allows for adequate advance planning and communication among participants, which is necessary for distillation of key findings and uncertainties, as well as for effective use of the presentation template. Preferred locations for the workshop include venues such as SERC, the National Conservation Training Center in Shepherdstown, WV, or available conference facilities in the Annapolis area.

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 estuary. The 2017 STAC Expert Panel review of the application of Generalized Additive Models (GAMs) for explaining trends in water quality supported continued application of this approach. The December 2017 STAC workshop "Integrating Recent Findings On Water Quality Change: Support for the MPA and Beyond" began a fruitful discussion among scientists across disciplinary and watershed-estuary boundaries, along with representative managers, with recognition that this dialogue must continue to in order to improve synthesis of scientific insights in support of adaptive management.



Rachel Dixon <dixonr@chesapeake.org>

WQGIT Letter of support for the STAC Workshop Proposal (3 of 3): Explaining Trends in Aquatic Conditions: Targeting Critical Insights and Gaps for the Next Generation of Synthesis and Application

1 message

Williams, Michelle <williams.michelle@epa.gov>

Fri, Feb 16, 2018 at 11:08 AM

To: "Dixonr@chesapeake.org" <Dixonr@chesapeake.org>

Cc: "(james.davis-martin@deq.virginia.gov)" <james.davis-martin@deq.virginia.gov>, "dinorah.dalmasy@maryland.gov" <dinorah.dalmasy@maryland.gov>, "Power, Lucinda" <power.lucinda@epa.gov>, "Keisman, Jennifer" <jkeisman@usgs.gov>

Submitted on behalf of James Davis Martin and Dinorah Dalmasy, Co-Chairs of the Water Quality Goal Implementation Team:

Dear STAC Leadership,

The Water Quality Goal Implementation Team (WQGIT) leadership supports the urgent need for the responsive workshop on **“Explaining Trends in Aquatic Conditions: Targeting Critical Insights and Gaps for the Next Generation of Synthesis and Application”**.

Chesapeake Bay watershed managers are engaged in an ongoing restoration effort that will require new insights to support evidence-based management for years to come. The December, 2017 STAC workshop on “Integrating Recent Findings to Explain Water Quality Change” provided a unique opportunity for direct dialogue and information exchange between estuarine and watershed researchers and jurisdiction managers from the CBP WQGIT. This workshop began a process that has promise for enhancing the targeting of research to support decision-making, and for accelerating knowledge transfer of existing research to address critical management questions. A second workshop in the winter of 2018-2019, focused on the topics identified by WQGIT representatives, will capitalize on the discussions and momentum gained in December 2017. The region’s scientists and jurisdiction managers are already leveraging these new relationships to improve information transfer for Phase III WIP development. The WQGIT favors organizers’ plans to work closely with researchers and managers in advance of the proposed workshop in order to make it even more productive and informative than the last one, further supporting evidence-based decision-making for ongoing adaptive management.

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

Sincerely,

James Davis-Martin, VA DEQ and Dinorah Dalmasy, MDE, Co-Chairs of the Water Quality Goal Implementation Team

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 16, 2018

Subject: Submission of STAC responsive workshop proposal

The Scientific and Technical Assessment and Reporting (STAR) team leaderships supports the acute need for the responsive workshop on **“Explaining Trends in Aquatic Conditions: Targeting Critical Insights and Gaps for the Next Generation of Synthesis and Application”**

The motivation for this workshop follows directly from the December, 2017 STAC workshop on “Integrating Recent Findings to Explain Water Quality Change”, which provided a venue for estuarine and watershed researchers involved in several recent topical research synthesis efforts to share their insights with each other, as well as with a small group of jurisdiction managers from the CBP WQGIT. While the workshop was a success, it became evident to the participants that this constituted just the first phase of an important process of science integration and communication to support the needs of environmental managers. The proposed workshop will once again provide a venue for dialogue between these communities, but the format and content will be revised slightly in order to build on lessons learned from the previous workshop. The organizers’ plans to work closely with researchers in advance of the workshop is key to the advancement of this process. This process will better distill insights and their implications into a common language that can bridge disciplinary boundaries, thereby improving our ability to target the next generation of science insights to the needs of local and regional environmental managers.

There is an urgent need to have the workshop during the next STAC workshop cycle in order to maintain the momentum generated at the first workshop. Proactive, continued advancement of our current focus of research insights is essential to providing new insights for upcoming cycles of evidence-based decision-making. The WQGIT has also expressed support for this workshop.

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

Sincerely,

Scott Phillips, USGS and Bill Dennison, UMCES