Chesapeake Bay Commission

Policy for the Bay

January 25, 2016

Dr. Lisa Wainger, Chair
Scientific and Technical Advisory Committee
Chesapeake Bay Program
645 Contees Wharf Road
Edgewater, MD 21037

Dear Dr. Wainger:

I write on behalf of the full membership of the Chesapeake Bay Commission to request a Scientific and Technical Advisory Committee (STAC) Responsive Workshop in 2016 on the topic of "legacy" sediment, riparian corridors, and Total Maximum Daily Loads. Synthesized science would be both timely and policy-relevant.

While the scientific discussion of this topic has been ongoing for several years, states are now considering how to address in-stream sediment in their Phase III Watershed Implementation Plans (WIPs). With recent estimates that in-stream sources of sediment could contribute as much as 50 percent of the nutrient and sediment loads to Chesapeake Bay, incorporation of "legacy" sediment in the WIPs is likely to be a priority and may significantly alter a state's plan of action from the current Phase II version.

A STAC workshop, with presentations from various points of view and a free and rigorous scientific debate, would greatly assist policymakers in understanding how "legacy" sediment and its remediation fit within a suite of management activities to reduce nutrient and sediment loads to the Chesapeake Bay. A report of the proceedings will inform the states as they begin early consideration of their Phase III WIPs in 2017. For maximum benefit, the scope of the workshop should consider nutrient and sediment loads, methods of remediation, and direct and indirect costs of remediation, including conflicts with other ecosystem management goals.

Thank you for your consideration of this request. The Chesapeake Bay Commission will be happy to assist STAC and members of the Steering Committee in preparing for a successful workshop. We also stand ready to receive and apply the results.

Sincerely,

Ann Pesiri Swanson
Executive Director

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Our signatures on this document affirm that we are STAC members willing to serve on the Steering Committee for the proposed STAC Responsive Workshop on "Legacy" sediment, riparian corridors, and Total Maximum Daily Loads. We are enthusiastically participating in this effort because it addresses a pressing need to synthesize the science of sediment processes for use in management decisions. The issue has some urgency because certain practices have been proposed to manage sediments as part of the TMDL, but their efficacy and appropriateness are not clear. This workshop will take an objective view of the science in order to inform decisions.

Andrew J. Miller, Professor, UMBC

Kathleen B. Boomer, Watershed Scientist,
The Nature Conservancy

Lisa A. Wainger, STAC Chair and Research Professor,
University of Maryland Center for Environmental Science

STAC Responsive Workshop (in response to a request from Chesapeake Research Consortium)
"Legacy" sediment, riparian corridors, and Total Maximum Daily Loads

Steering Committee Members:
Andrew Miller, UMBC (STAC member, lead)
Kathleen Boomer, Nature Conservancy (STAC member)
Lisa Wainger, UMCES (STAC chair)
Matthew Baker, UMBC
Karen Prestegaard, UMCP
Sean Smith, University of Maine

Workshop Rationale: The Chesapeake Bay Total Maximum Daily Load (TMDL) document requires that local jurisdictions reduce sediment and nutrient loads to Chesapeake Bay tributaries. Considerable attention has been devoted to the concept that "legacy" sediment deposits generated by both historical landscape changes and mill dams represent a significant but under-addressed source of sediment and nutrient pollution in the Chesapeake Bay watershed. Accordingly, it has been proposed that valley dredging should be implemented across broad extents to mechanically remove the "legacy" sediment and nutrient sources. This valley floor reconfiguration would create wetland conditions in locations where channels are currently bordered by higher banks. Proponents of such reconfiguration suggest it would enhance nonpoint source pollutant removal efficiencies. However there are alternative points of view based on research from the mid-Atlantic region about the relative importance of legacy sediment and historic mill dams as potential sediment sources to Chesapeake Bay. Fundamental questions remain about upland sediment sources, rates of ongoing floodplain deposition, and lag times for delivery of sediment, all of which may influence whether proposed strategies are effective in reducing loads to the Bay.

The Chesapeake Bay Commission has requested a STAC workshop be convened to review the scientific evidence comparing alternative strategies for meeting watershed-scale TMDL requirements for sediment and associated nutrients. The accompanying letter of support points out that with recent estimates that in-stream sources of sediment could contribute as much as 50 percent of the nutrient and sediment loads to Chesapeake Bay, incorporation of "legacy" sediment in the WIPs is likely to be a priority and may significantly alter a state's plan of action from the current Phase II version. A STAC workshop, with presentations from various points of view and a free and rigorous scientific debate, would greatly assist policymakers in understanding how "legacy" sediment and its remediation fit within a suite of management activities to reduce nutrient and sediment loads to the Chesapeake Bay. A report of the proceedings will inform the states as they begin early consideration of their Phase III WIPs in 2017.

Context of previous STAC workshops: A 2012 STAC Workshop, "Incorporating Lag Times Into The Chesapeake Bay Program," identified lag time as the gap between BMP implementation and delivery of the full water quality effect to the Bay and recognized that progress in water-quality improvements is sensitive to lag times and should be incorporated into modeling efforts. Although the workshop report does mention legacy sediment as an issue of potential interest, most of the questions raised below are not addressed in detail. The lag-time issue is part of the agenda of the current workshop but is only one among multiple considerations in evaluating the importance of legacy sediment and measures intended to reduce sediment loads. Furthermore additional research on this topic of direct relevance to the Bay watershed has been published since this workshop.

A 2014 STAC Workshop, "Designing Sustainable Stream Restoration Projects within the Chesapeake Bay Watershed," made passing reference to legacy sediment and the question of whether it is feasible to restore a modern stream to pre-colonial conditions. But the workshop report includes no detailed discussion of the issues raised above and therefore there is minimal overlap between the 2014 workshop and the one proposed here.

Proposed workshop questions and topics: The CBC request is intended to provide guidance and possibly reach consensus on the state of our understanding of "legacy sediment", its relation to the Chesapeake Bay, and approaches to addressing associated problems. The results from the workshop are intended to assist legislators, managers and regulators. Members of the steering committee have identified the following questions related to legacy sediment that are to be addressed in the proposed STAC workshop:

A. What is "legacy sediment", where do legacy deposits exist, and how do dams and other human infrastructure influence deposits and patterns of mobilization?
B. Does legacy sediment measurably influence Chesapeake Bay water quality and clarity?
C. Are there conflicts between legacy sediment management strategies and other watershed management and planning policies, environmental regulations, and funding demands?
D. How do nutrient and sediment load sources and potential reductions compare between uplands, headwater tributaries and higher order stream valleys?
E. Are the performance, cost and liability implications of headwater and downstream management approaches to non-point source pollution management the same?

The following are some specific questions that may be raised in the context of the broader questions listed above.

1. To what extent are watershed sediment yields attributable to remobilization of legacy sediment, and specifically to remobilization of milldam deposits?
2. What do we know about the extent to which sediment eroded from stream banks is either exported from the watershed or stored in downstream floodplains?
3. Is sediment stored behind milldams an important source of carbon and nutrients to tidewater? If so, is this common throughout the Bay watershed or is it specific to particular sites and not to others?
4. What state of a stream system are we actually trying to achieve and why? Under what conditions is it appropriate to try to recreate a pre-colonial riparian ecosystem in a watershed with 21st-century hydrology and land cover?
5. What are the relative merits of different mitigation approaches that are more (e.g. floodplain restoration or excavation) or less (e.g. riparian buffer zone creation and preservation) invasive?
6. What criteria should be applied to evaluate whether recommended strategies for reducing sediment and/or nutrient loads from stream banks and other sources are effective in urban vs. rural watersheds?
7. How are recent research results on lag times in sediment delivery relevant to the prospects for attaining TMDL goals with application of different management strategies?

Proposed workshop sessions:

Session I: State of the Science: Landforms: Current hypotheses/models of watershed conditions and related processes linked to the Chesapeake Bay

Session II: State of the Science: Nonpoint source pollution: Sediment and nutrient sources, sinks and transport times in Chesapeake Bay watershed settings

Session III: State of the Management: Efficacy, cost, planning and regulation of sediment and nutrient reduction options in Chesapeake Bay watershed settings

Session IV: Watershed and Water Quality Management Alternatives: Predictions and scenario projections of varied management strategies

List of possible invited speakers:

Rebecca Schneider, Cornell (Sediment from roadside and agricultural ditches)
Allen Gellis, USGS (Stream erosion and sediment fingerprinting)
Cliff Hupp/Greg Noe, USGS (floodplain sediment trapping)
Jim Pizzuto, University of Delaware (sediment residence and transport lag time)
Solange Filoso, University of Maryland (valley mitigation performance)
Steve Bloser, Center for Roads and Dirt Studies, PSU (sediment trapping practices)
Gopal Bhatt, PSU (modeling sediment processes at the watershed scale)

Dorothy Merritts /Robert Walter, Franklin & Marshall (legacy sediment valley deposits)
Allan James, University of South Carolina (legacy sediment definitions)
Ken Staver, University of Maryland (coastal plain nutrient transport)
Richard Lowrance, USDA (water quality modeling of riparian buffers)
Anne Hairston-Strang, MDDNR, or Al Todd, USDA (riparian buffer programs)
Margaret Palmer (watershed and stream restoration functions)
Don Weller, Smithsonian Environmental Research Center (downstream effects of riparian buffers)
Tom Jordan, Smithsonian Environmental Research Center (watershed biogeochemistry)
Tom Fisher, UMCES (biogeochemistry of riparian buffers)
Peter Kleinman, PSU/USDA-ARS (watershed biogeochemistry)
Paul Mayer, Chief, Ecological Effects Branch, EPA Corvallis (riparian zones and stream restoration)
Andy Miller, UMBC (relative importance of milldam deposits)
Matt Baker, UMBC (downstream effects of riparian buffers)
Sean Smith, University of Maine (upland vs lowland sediment sources)
Lisa Wainger, UMCES (valley dredging economics)
Karl Wegmann, North Carolina State University (legacy sediment erosion and water-quality)
Scott Lowe, McCormick-Taylor (overview of alternative stream restoration approaches)
Mark Gutshall, LandStudies (practical aspects of floodplain restoration planning and implementation)
Kevin Smith, Deputy Director for Restoration, Finance and Policy, MDDNR
Other agency representative from Virginia

Workshop Products:

1. Two full day workshop sessions
2. Summary report identifying points of consensus, uncertainty, conflicts and disagreements

Logistics: The 2-day workshop is intended to take place in Fall 2016, preferably between mid-October and mid-November. For the organizers the actual timing is flexible, but it would be preferable to hold the workshop before the end of calendar 2016 so as to provide appropriate feedback for consideration by states preparing Phase III WIPS. The organizers will begin planning as soon as STAC approval is received, with the goal of developing the workshop agenda, finalizing the list of presenters and developing materials for publicizing the workshop by end of June 2016. We will hold the workshop in a central location, such as Annapolis. Expected attendance is approximately 50-70 individuals. Invitees will include federal, state and local agency personnel as well as academic researchers. The summary report will be delivered to STAC within 90 days of the completion of the workshop.

Budget

Item	Cost
Venue	$2,000
Hotel (4 rooms, 1 note)	$1,000
Local transportation	$500
Airfare/train for up to 4 individuals	$2,000
Meals and food	$3,000
Total	**$8,500**

We propose to support travel for up to 4 individuals who will be invited from locations that require an overnight stay. Although the list of speakers is not finalized, we anticipate the need to support travel by one or more of the following: Rebecca Schneider, Allan James, Paul Mayer, Dorothy Merritts, Steve Bloser, Gopal Bhatt, Peter Kleinman, Sean Smith and Karl Wegmann. Their primary research areas relevant to the topic of this workshop are provided above in the list of possible invited speakers.

The EPA Office of Environmental Markets has expressed interest in this workshop and is a potential source of matching funds. The Chesapeake Bay Commission has put us in touch with Christopher Hartley at EPA and we intend to request up to $2500 to help cover workshop costs.