

Appendix L. Dissenting View Document.

This dissenting view document was compiled and vetted by the following Shoreline Management panelists:

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Chesapeake Bay Program
Shoreline Management
Expert Panel
Dissenting View

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The Shoreline Management Expert Panel met from January 2013 to March 2014, charged with quantifying the nitrogen, phosphorus, and sediment load reductions resulting from shoreline erosion control practices. The resulting panel report represents the majority view; however, significant dissent (40 % of the panel) characterized several of the main findings. The purpose of this dissenting view is to summarize the areas of dissent and describe its logic such that those reviewing the report, including various Bay Program committees and boards as well as the general public, can be aware of the issues. This dissenting document focuses on the science and the outcomes; however, some comments on the panel process are offered that may help inform adaptive management of the panel process by the Bay Program in the future.

Summary of the Report and the Dissent

The panel report describes four types of credit that can be earned by shoreline erosion control practices:

- 1) sediment and nutrients eroding from the bank immediately upland of the practice, termed “prevented sediment;”
- 2) sediment and nutrients captured through trapping sediment from the water column through contact with water through tidal action,
- 3) denitrification occurring in the wetlands created through living shorelines; and
- 4) nutrients bound through uptake by the plants used in a living shoreline.

The dissent focused entirely on the first type of credit: prevented sediment, which provides the bulk of the credit a typical shoreline management project would be awarded.

The two underlying principles serving as the basis for most of the dissent were:

- a) the treatment of sediment in the Chesapeake Bay Watershed Model (CBWM), in which sediment reduction credit is given across sediment grain sizes; for example, from fine-grained sediments emanating from upland construction sites (known to have adverse impacts on factors such as water quality) as well as naturally eroding large-grained sand particles from a bay-front cliff, (known to create wetland and SAV habitat),
- b) the narrow focus of the panel's charge on nutrients and sediment rather than an ecosystem approach, resulting in potential unintended consequences to other natural resources.

Sediment types: Not all sediment is “bad”

Shoreline erosion is a natural geologic process, experienced by shorelines of all estuaries worldwide, balancing such global forces as tectonic uplift (mountain ranges constantly erode, and sediments are carried down rivers) and sea level rise due to glaciation. Sediments, especially large-grained sediments, eroding from shorelines serve many important geologic and ecological functions, including supplying sediment that supports submerged aquatic vegetation (SAV) beds; wetlands; unvegetated beach habitat important for species like horseshoe crabs and terrapin; and dynamic sand spits and other similar features that protect low energy coves, which, in turn can be important habitat for seabirds and other wildlife (e.g., Kirwan and Megonigal, 2013). In fact, previous workshops and committees convened by the Chesapeake Bay Program have recognized the ecosystem value of eroding shorelines (Chesapeake Bay Program, 2005; Chesapeake Bay Program, 2006). Turning off that sediment supply with shoreline erosion control practices, whether “green practices” (e.g., living shorelines) or traditional hard armor, can interrupt the sediment budget for a region, negatively affecting SAV (Palinkas and Koch, 2012), wetland, and other habitat. Additionally, Patrick et al (in press) demonstrated negative impacts to SAV distribution when more than 5.4% of the shoreline has stone structures in a watershed, as identified by the 2006 VIMS Shoreline Inventory (which did not differentiate between revetment and sill). Solving one problem, as was the focus of this panel's charge, can cause an even greater problem in other natural resources.

This report attempted to manage this issue by only giving credit for the portion of prevented sediment that is fine-grained. To accomplish this, the total volume of sediment that was prevented from entering the system through the installed practice was multiplied by the percentage of the fine-grained sediments estimated to be present in the bank. However, while this approach does not give credit to prevention of the coarse-grained sediment, it still encourages its loss into the system by not providing a negative incentive. Preventing the fine-grained sediment from eroding, which may be a positive, should be balanced by prevention of the coarse-grained sediment from eroding, which is a negative. In the formula used, the positive outcomes are provided credit but the negative ramification is ignored.

Solution: The dissenting group on the expert panel therefore are of the opinion that protocol 1 in the report, which provides credit for prevented sediment, should be removed.

Focus on nutrients and sediment rather than ecosystem approach: Credit for armor

In the expert panel report, qualifying conditions are articulated in which nutrient and sediment credit can be earned for hard shoreline armor (conventional erosion control), such as bulkheads and on-shore stone revetments, particularly in cases in which living shorelines are not possible. Some on the panel felt that given what we know about impacts of such conventional armor on fish habitat, SAV habitat, and other resources, there should never be a credit offered to armor. Armor in estuaries generally removes the shallowest areas of habitat available, often removing the entire range considered to be refuge habitat (Jennings et al. 1999, Peterson et al. 2000, Bilkovic et al 2006, Davis et al 2008, Palinkas and Koch 2012, Patrick et al. in press). Armor may exhibit chemical differences or leach toxic chemicals (Weis et al. 1998). Armor can disrupt both chemically and biologically the land-water interface (Jennings et al. 1999). As a result of all of these factors, armored sites generally have lower species diversity of motile macrofauna and infauna, lower densities, and differences in body size (e.g., Peterson et al. 2000; Bilkovic and Roggero 2008, Davis et al. 2008; Long et al. 2011)

Armor in certain cases may be unavoidable or the only management solution, such as in highly developed port facilities or in areas in which toxic sediments are prevented from entering a waterway. This dissenting statement acknowledges that such armor should be used as a management option in some cases. However, the question is whether such practices should be allowed to receive sediment reduction credit in the bay model.

Solution: Given the negative impacts on other natural resources also managed by the Bay program, such as SAV, wetlands, fishes, and more, the dissenting group on the expert panel hold the opinion that while armor may be permitted by regulatory agencies in some cases, it should not be provided sediment or nutrient credit.

Management ramifications

The outcome of the expert panel report is such that shoreline erosion control projects in some cases will be calculated to provide as much if not more than the reduction credit for nitrogen, phosphorus, and sediment per linear foot than stream restoration or stormwater practices like bioretention cells. As a result, the costs may be less expensive per pound of pollutant relative to stream restoration or stormwater management practices. Such differences are likely to drive management choices by local jurisdictions charged with meeting total maximum daily load targets (TMDLs), even though these sources of nutrients and sediment are not a direct result of human activity but are instead a natural process. Ecologically and from a larger systems perspective, the practices are not as valuable and may actually be a net detriment.

Local jurisdictions and other landowners may choose to or need to install erosion control practices for their erosion protection value, independent of any nutrient or sediment credit to be earned. This dissenting document does not address when such practices should be pursued or permitted, instead only focusing on whether or not those shoreline erosion control practices should be awarded TMDL credit. Qualifying conditions have been and should continue to be quantified as part of federal, state, and local permitting processes to include explicit criteria for when erosion control practices of any kind are allowed.

Process comments

This panel, as those that came before and will come afterwards, was charged with attributing numerical values to water quality services associated with various management practices. While intentionally singular in water quality focus, this process makes consideration of other issues, such as habitat or public access, difficult if not impossible. From an integrated ecosystem perspective, this is not a sustainable approach to “valuing” management practices.

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