Quantifying Ecosystem Services and Co-Benefits of Nutrient and Sediment Pollutant Reducing BMPs

Scientific and Technical Advisory Committee Workshop

March 29th-30th, 2017

Workshop Location: Crowne Plaza Hotel, 173 Jennifer Rd., Annapolis, MD 21401

http://www.chesapeake.org/stac/workshop.php?activity_id=274

Workshop Summary: On March 29-30, 2017, approximately 50 people representing a range of interests and perspectives met in Annapolis, MD for the above-titled STAC workshop. The purpose was to identify the "ecosystem service" benefits of implementing best management practices (BMPs) designed to improve water quality and discuss how they could be integrated into existing decision-making tools. Another desired outcome was a shared understanding by workshop participants of the opportunities for, and constraints on, quantifying these benefits. The underlying premise is that if local decision makers better understand additional benefits of best management practices (BMPs) they are already working to implement for water quality improvement—benefits such as flood risk reduction, air pollution treatment, and enhanced recreational opportunities—they may be able to better coordinate their investments and meet multiple objectives for their communities.

We quickly learned that participants defined the term "Ecosystem Services" very differently. Some participants suggested that the term "bonus benefits" might be less confusing in this context, but still there is an obvious need for understandable definitions and clear communication on this topic. Participants also agreed that: 1) the need to meet water quality goals required by the Chesapeake Bay Total Maximum Daily Load (TMDL) is the main driver of implementation; 2) the 2014 Chesapeake Bay Watershed Agreement includes other goals beyond water quality, and BMPs may also benefit those goals; 3) the impact of BMPs on jobs and economic development is important; and 4) resources (funding, time, people) are limited, so prioritization is needed.

The first morning was comprised of presentations by economists designed to provide context for how these bonus benefits can be identified, quantified, and valued and the challenges therein. Key messages included: identification, quantification, and valuation of ecosystem service benefits are distinct but related activities (i.e., benefits must be identified before they can be quantified, and quantified before they can be valued); each of these three activities can be useful for decision making, depending on the context; and benefits accruing from a particular action often vary locally/geographically (i.e., scale and location are important). The presentations also highlighted existing tools/quantification approaches that could, with additional effort, be leveraged by the Chesapeake Bay Program. These included the approach used by Wainger *et al*. (2013) for estimating benefits of green infrastructure practices in the Chesapeake,[1] the social cost of carbon to quantify and monetize benefits of reducing greenhouse gases,[2] and the I-Tree tool[3] that can be used to quantify benefits of trees on air pollutant treatment and soon will be modified to include reduced heat related illnesses.

In the afternoon, participants were separated into two groups, based on background and expertise: ecologists/economists and policy/government experts. The groups were asked to review a short list of BMPs and some associated "bonus benefits". These BMPs and benefits were prioritized based a recent

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[1] Wainger, et al. 2013. Accessed here: http://ageconsearch.tind.io//bitstream/148408/2/ARER%202013%2042x1%20WaingerEtal.pdf

[2] http://www.cfare.org/UserFiles/file/Chapter3-EstimatedValuesofCarbonSequestrationResultingfromForestManagementPolicyScenarios_v1.pdf

[3] http://www.itreetools.org/

evaluation by Tetra Tech that estimated the benefits of these practices to the other goals of the 2014 Chesapeake Watershed Agreement.[4] The ecologists and economists were asked to consider which practices and benefits were supported by readily available tools, while the policy implementers were asked to consider which practices were missing and which of the "bonus benefits" were most important.

On Day 2, we took the short list of priority benefits and worked in small groups with subject matter experts to identify practices that provided each benefit, available quantification tools, and scale and locational considerations. *The priority benefits included: ecosystem sustainability, which participants interpreted to include benefits to local waters, fish habitat and other aquatic resources; hazard mitigation, interpreted as flood risk reduction; recreation and aesthetic value (e.g., hunting, fishing swimming, nature watching, canoeing, etc); and waste treatment (e.g., reducing bacteria in outflows) and benefits to drinking water (e.g., reduced treatment costs).*

Take home messages and next steps included:

1) ***Many stakeholders were missing or under-represented at the workshop.*** Participants suggested targeted outreach efforts or listening sessions to solicit broader input on what benefits and practices are important. This could also help educate a broader group of stakeholders about the concept of "bonus benefits." Mary Gattis (Local Government Advisory Committee) offered to help facilitate this effort.
2) ***The level of information needed depends on the stakeholder.*** For some stakeholders, simply knowing that a practice provided additional benefits (i.e., "yes or no"), particularly those linked to outcomes of the 2014 Chesapeake Watershed Agreement, may be enough. To that end, we should build upon the Tetra Tech report and spreadsheet by, for example, making this information more accessible and user-friendly and possibly incorporating their scoring system directly into CAST. Other stakeholders desired more robust and quantifiable information on bonus benefits. There was agreement that some benefits/services had enough existing information that they could be fairly readily incorporated into decision-making tools (e.g., I-tree tool that estimates benefits of trees on reducing air pollution, carbon sequestration benefits of vegetation). Participants recommended assembling appropriate experts to examine one or two benefits in more detail. The outcome would be a proposed framework and approach by which the quantification of these benefits could be incorporated into CAST. We should pursue an RFP and funding to initiate this effort.
3) ***Transparency is critical.*** Participants were willing to accept uncertainty in quantification of bonus benefits, but felt it was critical to be transparent and upfront about uncertainty and assumptions in our decision-making tools. Next steps in targeted outreach with stakeholders should always include this transparency.

[4] Link to Tetra Tech matrix and reduced matrix