# Lowering Barriers to Achieving Multiple Environmental Goals in the Chesapeake Bay

## Front Matter

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*Authors*

*Lisa A. Wainger[1], Jay J. Messer[2], Mary C. Barber[3], Robert M. Wolcott[4] and Andrew L. Almeter[2]*

1 University of Maryland Center for Environmental Science, 1 Williams Street, P.O. Box 38 Solomons, MD 20688

2 US EPA, Office of Research and Development, 109 TW Alexander Dr, Research Triangle Park, NC 27711

3 RTI International, 701 13th St NW # 750, Washington, DC 20005

4 US EPA, Office of Research and Development, 1200 Pennsylvania Avenue Northwest, Washington, DC 20460

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## Introduction to Report

In recognition of past unsuccessful restoration strategies for the Chesapeake Bay, President Obama signed Executive Order (EO) 13508 "Strategy for Protecting and Restoring the Chesapeake Bay Watershed" in 2009. This order requires federal agencies to work together to bring new resources and tools to the Bay restoration effort, including new approaches to implementing the Clean Water Act (CWA) and new funding for voluntary efforts by farmers. Other efforts are aimed at improving the targeting and coordination of practice implementation by local governments, non-profit agencies, and citizens. Examples include the Chesapeake Bay Watershed Initiative, authorized in the 2008 Farm Bill, and grants administered through the Chesapeake Bay Trust and National Fish and Wildlife Foundation. The strategy is a bold and complex effort to apply a "comprehensive, ecosystem-wide" approach to restoration, and its success depends on engaging citizens, firms and governments, at all levels.

The first test of the strategy involves implementing plans to achieve the Bay-wide Total Maximum Daily Loads (TMDLs), which set maximum nitrogen, phosphorus and sediment target loads for the major tributaries of the Bay. Meeting these target loads is considered essential for improving aquatic life resources. To achieve these goals, states within the Bay watershed are required to develop Watershed Implementation Plans (WIPs) that lay out plans for achieving target loads with "reasonable assurance" of success. The goals are ambitious and long-term success requires that all new sources of nutrients, phosphorus, and sediment be offset in order to maintain target loads in the face of population growth.

While there is expansive public support for the Bay restoration goals, the substantial costs create barriers to success. The cost of achieving TMDLs is not known, but available estimates are on the order of $28 Billion[5]. Costs of other Bay restoration efforts are even less well understood. These costs have, naturally, created concerns on the part of state and local governments that are required to meet these goals with funds that fall well short of these estimates. Various types of environmental trading have been proposed as a way to reduce costs, but it is not clear whether the necessary mix of public and private funds will become available to implement this ambitious restoration effort.

Our aim is to address the broad question, "What policies promote Chesapeake Bay restoration goals by removing barriers to innovation and cost-efficiency?" This question is critical to achieving both the TMDLs and the suite of other restoration goals for habitat and quality of life factors within the watershed. While the TMDL is the first milestone in the Bay's restoration path, a focus on water quality alone may increase costs of restoration by failing to take advantage of opportunities to produce multiple beneficial outcomes from any given activity. By evaluating opportunities for innovation and cost-effectiveness in meeting TMDLs and by looking for opportunities for programs to simultaneously serve multiple goals; we seek to break through the narrow focus imposed by water quality regulation.

This white paper includes five chapters that address these issues from different perspectives. The first chapter, by Lisa Wainger and Mary Barber, compares a number of innovative case studies for their opportunity to serve as models for restoration approaches throughout the watershed. The case studies represent programs that have been successful at motivating a variety of activities to reduce nutrient runoff or restore aesthetics and habitat by owners and/or managers of agricultural and suburban lands. The case studies reviewed include a water quality trading program that was successful at reducing costs and a payment for ecosystem service program that stressed paying for performance outcomes rather than practice implementation. The chapter gleans principles from these case studies to examine whether their success could be replicated broadly in the Bay watershed by considering the topics of: securing funding,

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[5] Shenk, K. Personal Communication (2011, January 27). *Preliminary Tributary Strategy Cost by State.* EPA Chesapeake Bay Program Office Report (10/26/04). Annapolis, Maryland.

engaging landowners and managers, and developing effective methods for ensuring environmental outcomes.

Chapter 2, by J.B. Ruhl, looks broadly at the flexibility offered by the Clean Water Act (CWA) for policy innovation to address multiple ecosystem services in the context of TMDLs or other programs used to meet water quality goals. This work addresses many of the legal or programmatic impediments to achieving cost-efficiency by highlighting some of the opportunities for working within the "policy space" of CWA regulation. Although statutory language in the CWA offers constraints, his analysis suggests government officials should not underestimate the flexibility to adjust programs solely through changes in program administration.

Chapter 3, by Lisa Wainger, discusses opportunities for enhancing cost-effectiveness of TMDLs, by examining how program design and implementation can be made consistent with market-based approaches and efficient targeting of effort. Some key challenges discussed are using regulatory authority so as to promote, rather than hinder the ability to innovate, trade, or use the most cost-effective offsets. Other considerations include ensuring the environmental performance of programs and rectifying diverse goals. The challenges of establishing water quality credit markets suggests that alternative approaches may be needed to successfully engage the agricultural sector and lower costs of achieving TMDLs.

Leonard Shabman, Bob Rose and Kurt Stephenson, in Chapter 4, discuss an approach for engaging communities in collective action through an innovative approach they call *Reward for Environmental Services (RES) Programs*. While Payment for Ecosystem Services (PES) has become a well-known concept, the RES idea recognizes that community groups may offer unique advantages and approaches to collectively managing resources. Therefore, such groups may be effective at reducing nutrients and sediment outflows to the Bay while also promoting outcomes that resonate strongly with the local community.

In the final chapter, Stephenson and Shabman consider the potential for using a new set of technologies - nutrient assimilation - within a water quality trading program. Nutrient assimilation is a suite of approaches that enhance natural processes that remove nutrients directly from ambient waters such as uptake by plants or animals, sediment burial, or dispersal to the atmosphere. The ability to incorporate emerging approaches to nutrient reductions in TMDL strategies is currently constrained by a lack of information that would allow new approaches to be given nutrient reduction credits towards the TMDL. The chapter reviews the potential for generating nutrient assimilation credits, describes what is known about their efficacy and capacity to remove nutrients, and how their equivalence to other nutrient removal approaches can be measured given the larger context of emission market requirements and concerns. Such practices are similar to using non-point source practices to reduce nutrients, but appear to offer increased certainty that offsets are equivalent to point source emissions.

The Bay restoration goals will not be achieved without using a suite of tools and innovative approaches at multiple scales. The costs of actions are substantial and the ability to motivate actions is limited by legal, logistical and social barriers. However, the approaches presented here describe some of the ways to overcome barriers through strategies that promote innovation and use available funds efficiently. Those strategies include:

1. Allowing regulated parties and local stakeholders to decide how best to achieve goals

2. Ensuring outcomes through monitoring, adaptive management, and robust testing of technologies

3. Targeting public money to actions with high cost-effectiveness and seeking economies of scale by enlarging promising pilot programs

In sum, achieving goals includes the will to creatively navigate existing regulation and programs in order to seek the flexibility needed to promote effective strategies and to coordinate actions to get the most of every dollar spent.