Cleaning Up the Chesapeake Bay

An Overview of the New Framework to Guide Restoration Efforts

Department of Legislative Services 2009

Cleaning Up the Chesapeake Bay

An Overview of the New Framework to Guide Restoration Efforts

Department of Legislative Services
Office of Policy Analysis
Annapolis, Maryland

December 2009

Primary Staff for This Report

Elisa R. Ford

Other Staff Who Contributed to This Report

Lesley G. Cook
Ryane M. Necessary
Alicia R. Rummings
Carol L. Swan

For further information concerning this document contact:

Library and Information Services
Office of Policy Analysis
Department of Legislative Services
90 State Circle
Annapolis, Maryland 21401

Baltimore Area: 410-946-5400 ! Washington Area: 301-970-5400
Other Areas: 1-800-492-7122, Extension 5400
TDD: 410-946-5401 ! 301-970-5401
Maryland Relay Service: 1-800-735-2258
E-mail: libr@mlis.state.md.us
Home Page: http://mlis.state.md.us

December 16, 2009

The Honorable Thomas. V. Mike Miller, Jr., President of the Senate
The Honorable Michael E. Busch, Speaker of the House of Delegates
Honorable Members of the Maryland General Assembly

Ladies and Gentlemen:

Efforts to restore the Chesapeake Bay over the past three decades have failed. In response, a new policy framework is emerging that emphasizes stronger federal oversight of the Chesapeake Bay restoration process. Key elements of this framework include a May 2009 federal executive order on Chesapeake Bay Restoration and Protection, the creation of two-year restoration policy milestones by the bay states, and the development of a bay-wide nutrient pollution budget by the U.S. Environmental Protection Agency. In addition, federal legislation addressing the restoration effort has been introduced in Congress.

Given the significance of the policy changes emerging at the federal and State levels, during the 2009 interim, the Natural Resources, Environment, and Transportation Workgroup of the Office of Policy Analysis prepared this report to provide background information on the restoration process and related efforts, an overview of the new restoration framework, and a discussion of some potential funding and policy implications.

Given the ongoing interest in bay restoration by members of the General Assembly, I trust that this report will prove useful to you during the consideration of any proposed legislation or regulations that may be forthcoming.

For further information on this report, please contact Lesley G. Cook of the Office of Policy Analysis at (410) 946-5510.

Sincerely,

Warren G. Deschenaux
Director

WGD/arr

Contents

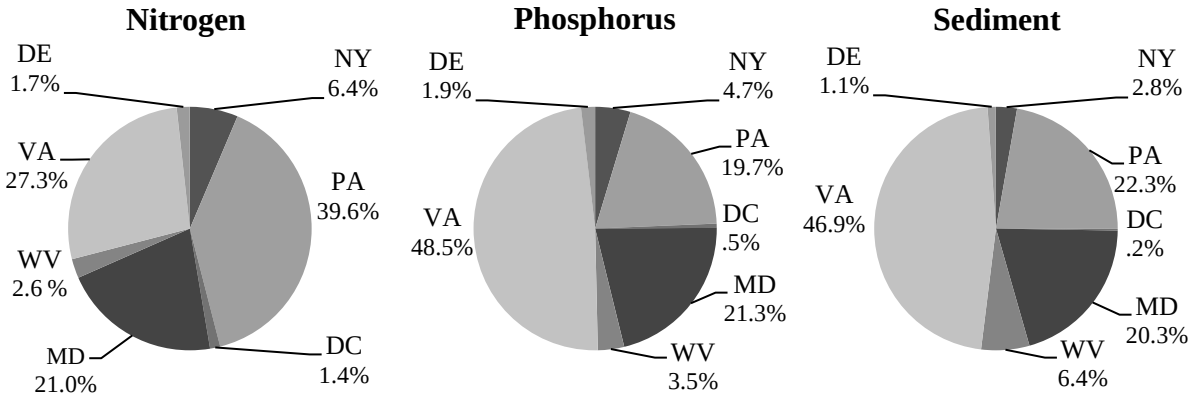
Chapter 1
Update on Chesapeake Bay Restoration

Background

The Chesapeake Bay is America's largest and most biologically diverse estuary, home to more than 3,600 species of plants, fish, and animals. The watershed of the Chesapeake Bay totals about 64,000 square miles and stretches from the Finger Lakes in New York down to Norfolk, Virginia. Nearly 17 million people live in the watershed, and the population is growing by an estimated 150,000 people each year. Over the past several decades, the health of the bay has degraded significantly as a result of sediment and nutrient (nitrogen and phosphorus) pollution from sewage treatment plants, agricultural use of manures and fertilizers, and urban runoff. These sources of pollution continue to grow as the population increases and the use of the land and the watershed is intensified.

In 2008, Maryland was responsible for 21% of the nitrogen, 21% of the phosphorus, and 20% of the sediment loads entering the Chesapeake Bay as shown in **Exhibit 1.**

Exhibit 1
Pollutant Loads to the Chesapeake Bay by Jurisdiction
(2008)

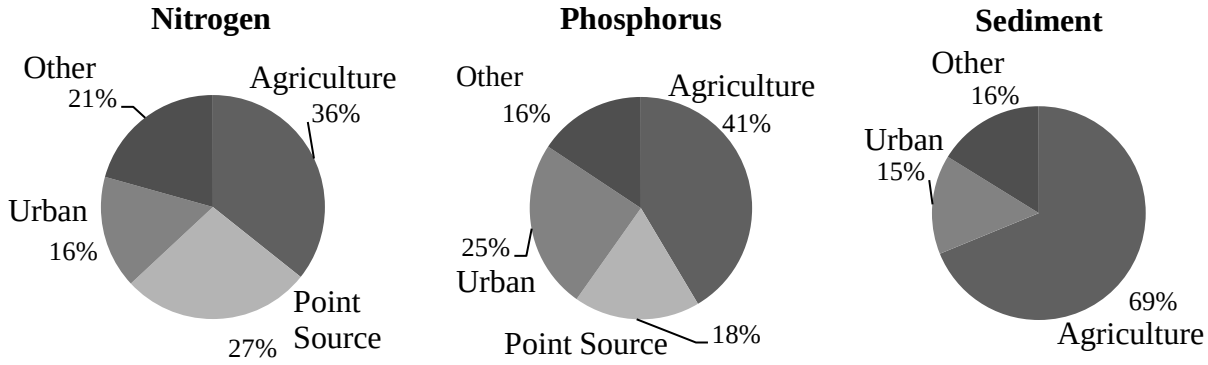


Source: U.S. Environmental Protection Agency's Chesapeake Bay Program (Phase 4.3 Model Run, April 2009)

As of 2008, in Maryland's portion of the Chesapeake Bay watershed, 44% of the land is forested, 32% is urban/mixed use open, and 23% is in agricultural use. As shown in **Exhibit 2**, agriculture is the largest source of sediment (69%) and nutrients (36% nitrogen, 41% phosphorus) from Maryland. Urban runoff contributes 15% of the sediment, 16% of the nitrogen, and 25% of the phosphorus coming from Maryland. Point sources in Maryland (such

as sewage treatment plants and industrial wastewater systems) contribute 27% of the State's nitrogen load and 18% of the State's phosphorus load. These load estimates include nitrogen from the air that is deposited onto the watershed and washed into the bay. Watershed-wide, air pollutants comprise an estimated third of the total nitrogen load entering the Chesapeake Bay each year.

Exhibit 2
Maryland's Pollutant Loads to the Chesapeake Bay by Source
(2008)



Note: "Other" includes mixed open, septic, forest, and non-tidal water deposition.

Source: U.S. Environmental Protection Agency's Chesapeake Bay Program (Phase 4.3 Model Run, April 2009)

In response to the degradation of the Chesapeake Bay, a number of intergovernmental agreements have been signed with the goal of restoring the water quality and living resources of the bay. A discussion of these follows.

The Chesapeake Bay Agreements

In 1983, Maryland, Virginia, Pennsylvania, the District of Columbia, the Chesapeake Bay Commission (a tri-state legislative assembly representing Maryland, Pennsylvania, and Virginia), and the U.S. Environmental Protection Agency (EPA) signed the first Chesapeake Bay Agreement. The signatories, also referred to as the "Chesapeake Bay partners," committed to broad new objectives for the restoration of the waters and living resources of the Chesapeake Bay. The Chesapeake Bay partners also established the Chesapeake Bay Executive Council to oversee restoration efforts. This was followed by another agreement in 1987, which established more far-reaching objectives, including a goal to reduce nutrient loadings by 40% by

2000. As a result of these agreements, the states and the federal government enacted laws and established programs to move toward the cooperatively established goals to restore the water quality and living resources of the bay, including a wide range of actions to support agricultural best management practices and to fund improvements to sewage treatment plants. Additional amendments were added to the agreements in 1992 to establish specified nutrient reduction targets for the watersheds of each of the Chesapeake Bay's 10 major tributaries.

By the late 1990s, despite efforts under the bay agreements, major portions of the Chesapeake Bay and waters in its watershed were listed as "impaired waters" under the federal Clean Water Act (CWA). The CWA requires states to designate intended uses for their water bodies, such as swimming and fishing, and to set water quality standards to achieve these uses. Water bodies that do not meet the water quality standards are designated as "impaired" and are assigned a Total Maximum Daily Load (TMDL), which sets the maximum amount of pollution that a water body can receive and still attain water quality standards. The TMDL identifies all sources that contribute to the "impaired" water body and allocates reductions from those sources so that water quality standards can be attained. Though designated as impaired, to date TMDLs have not been established for the Chesapeake Bay.

To jump-start the TMDL process, environmental groups filed lawsuits in Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia seeking to compel EPA to develop TMDLs for the Chesapeake Bay and certain impaired waters in the Chesapeake Bay watershed. As a result of these actions, EPA was required by consent decree to develop TMDLs for the Chesapeake Bay by 2011.

In response to the failure of the bay agreements and looming federal action under the CWA as a result of the consent decrees, the Chesapeake Bay partners returned to the drawing board in 2000, looking for new, more specific means to guide restoration efforts. The result was the Chesapeake 2000 Agreement, discussed below.

Chesapeake 2000 Agreement

In 2000, the Chesapeake Bay partners signed the Chesapeake 2000 Agreement (C2K), with the bold goal of removing the Chesapeake Bay from the EPA's impaired waters list prior to the time when TMDLs would be imposed. This goal required resetting to realistic levels the entire system of water quality designated uses, criteria, and standards in the bay and the tidal tributaries. It also required nutrient reduction goals to be substantially more aggressive.

The new water quality standards were stated for the first time in terms of actual living resource response and recovery, as measured by oxygen, chlorophyll, and water clarity. What prevents these standards from being met are the excess of nutrients and sediment being loaded into the bay from the rivers and shorelines. Therefore, the reductions assigned to each tributary related to these pollutants.

On a watershed basis, C2K committed the Chesapeake Bay partners to new goals to reduce:

- nitrogen loads by 95.0 million pounds per year from 2004 levels (to 175.0 million pounds per year);
- phosphorus loads by 5.97 million pounds per year from 2004 levels (to 12.8 million pounds per year); and
- sediment loads by 0.775 million tons per year from 2004 levels (to 4.15 million tons per year).

To implement the watershed-wide goals of C2K, specific pollution reduction goals were allocated to each of the signatory states and the District of Columbia.

Maryland's pollutant reduction goals required a reduction in:

- nitrogen loads by nearly 20.0 million pounds per year from 2004 levels (to 37.3 million pounds per year);
- phosphorus loads by 0.9 million pounds per year from 2004 levels (to 2.92 million pounds per year); and
- sediment loads by 0.283 million tons per year from 2004 levels (to 0.712 million tons per year).

If C2K's goals were not met by 2010, the bay partners agreed that a bay-wide TMDL was to be developed by 2011 and pollutant loading limits for all sources within the watershed were to be set. These sources included discharges from point sources, nonpoint sources (such as runoff from farms, rural residential areas, and septic systems) and air deposition (emissions from power plants and motor vehicles). If a state failed to do its part to implement a bay-wide TMDL by 2011 and meet water quality standards, EPA reserved the power to enforce the goals and withhold millions of dollars in grants to that state.

In addition to its focus on water quality, C2K also created goals related to living resource protection, habitat preservation, land use policy, and community engagement.

Maryland's Efforts to Reach the C2K Goals

Maryland has taken numerous steps to meet the C2K goals, most recently including the establishment of Maryland's Tributary Strategy (and the associated implementation plan), the Bay Restoration Fund, BayStat, and the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund. These efforts are described briefly below.

Maryland's Tributary Strategy

Maryland's Tributary Strategies Program was officially created when the State signed the 1992 amendments to the Chesapeake Bay agreements, which established specified nutrient reduction targets for the watersheds of each of the Chesapeake Bay's 10 major tributaries. A Tributary Team composed of citizens, business leaders, farmers, watershed organizations, and local, State, and federal government representatives was established in each watershed. Since 1995, these teams have been working to meet the goals established in the Chesapeake Bay agreements through policy, restoration, education, and outreach activities.

Following the signing of C2K, Maryland began working with tributary teams to revise the tributary strategies in order to meet the new goals. Between 2000 and 2004, more than 25 public meetings were convened to obtain input from stakeholders. This information was used to compile *Maryland's Tributary Strategy*, published in April 2004. The tributary strategy was intended to be the road map that the State would use to achieve and maintain the water quality and habitat improvement goals of C2K. The tributary strategy identified a number of actions that the State, through its various agencies and programs, would undertake to reduce nutrient and sediment pollution from all sources.

Once the tributary strategy was developed, the State and the tributary teams began to craft *Maryland's Tributary Strategy Statewide Implementation Plan*. This plan, the final version of which was released in August 2007, describes ways to achieve the tributary strategy goals with regard to point sources, stormwater, septic systems, growth management, agriculture, and air deposition. The plan also includes strategies to achieve, maintain, and monitor water quality goals.

Bay Restoration Fund

Established under Chapter 428 of the Acts of 2004, the Bay Restoration Fund provides funding to reduce nutrient pollution to the Chesapeake Bay. The fund is financed by a bay restoration fee on users of wastewater facilities, septic systems, and sewage holding tanks.

The revenue collected from users of wastewater facilities is used to provide grants and to pay the debt service on revenue bonds for the costs of upgrading the State's 67 major publicly owned wastewater facilities with enhanced nutrient removal technology (technology capable of achieving wastewater effluent quality of 3 milligrams per liter (mg/l) total nitrogen and 0.3 mg/l total phosphorus). Through July 2009, approximately $243 million in fee revenue

had been collected from users of wastewater facilities. To date, 11 of the State's 67 major wastewater facilities have been upgraded. Once all 67 facilities have been upgraded, nitrogen loading to the bay will be reduced by approximately 7.5 million pounds per year, and phosphorus loading to the bay will be reduced by more than 260,000 pounds per year (from 2000 levels).

Sixty percent of the fee revenue collected from septic system users is used to provide grants to septic system owners to upgrade their systems with nitrogen removal technology.[1] According to the Maryland Department of the Environment (MDE), the average septic system delivers about 30 pounds of nitrogen per year to the groundwater. Of the estimated 420,000 septic systems in Maryland, 52,000 septic systems are in the Critical Area, and approximately 80% of the nitrogen from a septic system in the Critical Area will reach surface waters.[2] MDE advises that an upgraded septic system cuts a system's nitrogen load in half. Through July 2009, over $51 million in fee revenue had been collected from septic system users, and nearly 1,300 septic systems had been upgraded with nitrogen removal technology.

The remaining 40% of fee revenue collected from septic system users is transferred to the Maryland Agricultural Water Quality Cost Share Program (MACS) within the Maryland Department of Agriculture (MDA) to provide financial assistance to farmers for planting cover crops.[3] Cover crops are small grains such as wheat or rye that are planted in the fall after the harvest of corn, soybeans, and other summer crops to absorb unused fertilizers that may remain in the soil. Maryland's Tributary Strategy goal is to plant 800,000 acres of cover crops each year. In 2008, less than 200,000 acres were planted. MDA advises that 1,233 applications for 330,469 acres of cover crops have been approved for 2009; however, due to funding constraints, not all of those acres will be planted.

BayStat

In February 2007, the Governor created BayStat (Executive Order 01.01.2007.02) as a joint project of the departments of Agriculture, Natural Resources, Environment, and Planning. It was established as an accountability mechanism for measuring and evaluating State initiatives directed toward restoring the Chesapeake Bay, with the intent of ensuring that those government programs are coordinated and operating at their highest efficiency.

---

[1] For fiscal 2010 only, the allocation of septic system user fee revenue was altered by budget reconciliation legislation. Pursuant to Chapter 487 of 2009, for fiscal 2010 only, 22.4% of the revenue is allocated to MDE for septic system upgrades, while 77.6% of the revenue is allocated to MDA for cover crop activities.

[2] The Chesapeake and Atlantic Coastal Bays Critical Area generally consists of all lands within 1,000 feet of the edge of tidal waters of the Chesapeake Bay, the coastal bays, and their tributaries, or from the landward edge of adjacent tidal wetlands, and all tidal waters and lands under those waters and wetlands.

[3] For fiscal 2010 only, the allocation of septic system user fee revenue was altered by budget reconciliation legislation. Pursuant to Chapter 487 of 2009, for fiscal 2010 only, 22.4% of the revenue is allocated to MDE for septic system upgrades, while 77.6% of the revenue is allocated to MDA for cover crop activities.

Chapters 120 and 121 of 2008 generally codified the BayStat Program, established a BayStat Subcabinet and a related scientific advisory panel, expanded the program's charge to include the Atlantic Coastal Bays, and expanded program duties.

The BayStat Subcabinet is currently composed of the Secretary of Natural Resources, the Secretary of the Environment, the Secretary of Planning, the Secretary of Agriculture, the President of the University of Maryland Center for Environmental Science, the Dean of the College of Agriculture and Natural and Resources at the University of Maryland, College Park, and the Chair of the Critical Area Commission. The BayStat Subcabinet meets on a monthly basis and is responsible for overseeing the administration of the BayStat Program, as well as the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund.

Chesapeake and Atlantic Coastal Bays 2010 Trust Fund

Chapter 6 of the 2007 special session established a Chesapeake Bay 2010 Trust Fund to finance implementation of Maryland's tributary strategy to meet the C2K goals. The trust fund is financed with a portion of existing revenues from the motor fuel tax and the sales and use tax on short-term vehicle rentals.

Chapters 120 and 121 of 2008 specified that the funds be used for nonpoint source pollution control projects, expanded the fund's geographic scope to include the Atlantic Coastal Bays, renamed the fund the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, and made the BayStat subcabinet responsible for fund administration (in addition to the Department of Natural Resources (DNR)).

Money in the trust fund must be distributed by the subcabinet agencies as follows:

- to counties, bicounty agencies, municipalities, forest conservation district boards, soil conservation districts, academic institutions, and nonprofit organizations having demonstrated ability to implement nonpoint source pollution control projects through competitive grants;

- the Maryland Department of Agriculture's MACS, which provides financial assistance to farmers for planting cover crops and installing other best management practices;

- DNR's Woodland Incentives Fund, used to assist eligible landowners in conducting woodland management; and

- MDE's Chesapeake and Atlantic Coastal Bays Nonpoint Source Fund (also created by Chapters 120 and 121 of 2008), used to provide financial assistance for urban and suburban stormwater management practices and stream/wetland restoration.

C2K Fails

Although numerous efforts to restore the bay's water quality are underway across the Chesapeake Bay watershed, including those described above in Maryland, it is widely recognized that the goals of C2K will not be met by 2010. In fact, due to population growth and related development, EPA's Chesapeake Bay Program reports that in some locations conditions have actually deteriorated since C2K was signed.

Watershed-wide, according to the Chesapeake Bay Program, from 1985 to 2008 the bay achieved 47% of C2K's nitrogen reduction goal, 63% of C2K's phosphorus reduction goal, and 64% of C2K's sediment reduction goal. Over the last few years these numbers have remained fairly static, indicating that progress toward meeting the C2K goals has stagnated.

Maryland is also expected to fall far short of meeting its state-specific goals under C2K. To meet these goals, Maryland would need to cut the amount of nitrogen entering the bay by about 32%, the amount of phosphorus entering the bay by about 21%, and the amount of sediment entering the bay by about 27% (from 2008 levels). Maryland's progress toward reaching its C2K goals is shown in **Exhibit 3.**

Exhibit 3
Maryland's Pollutant Reduction Goals under C2K and Progress toward Meeting those Goals

Pollutant	1985 Loads	2008 Loads	2010 Goal
Nitrogen (million lbs/yr)	81.07	54.36	37.25
Phosphorus (million lbs/yr)	6.46	3.77	2.92
Sediment (million tons/yr)	1.26	0.96	0.71

Source: U.S. Environmental Protection Agency's Chesapeake Bay Program (Phase 4.3 Model Run, April 2009)

Note: Load data are estimates derived by computer models. EPA has recently stated that phosphorus and nitrogen loads to the bay in 2008 were higher than indicated under previous modeling, but EPA has also stated that the amount by which states will need to reduce nutrient loads to the bay is less than previously believed.

As a result of this expected failure, a new framework for restoration is emerging. This framework is described in the next chapter.

Chapter 2
A New Bay Restoration Framework Emerges

In response to the failure of the Chesapeake 2000 Agreement (C2K), a new framework is emerging that emphasizes stronger oversight over the Chesapeake Bay restoration process by the federal government. Environmental organizations have sued to require the federal government to take a stronger lead. At the same time, the U.S. Environmental Protection Agency (EPA) has signaled its intention to take a more active role by announcing that it will establish a bay-wide Total Maximum Daily Load (TMDL) at an accelerated pace. Jurisdictions in the bay watershed have recommitted themselves to restoring the bay, in coordination with the federal government, by establishing new two-year incremental restoration goals, called "milestones", intended to guide restoration efforts before EPA establishes the bay-wide TMDL, and then to help implement the bay-wide TMDL once established. Finally, President Obama issued an executive order calling on the federal government to take the lead in renewed efforts to restore the bay and its watershed. Each of these new elements is discussed below.

Chesapeake Bay Foundation v. EPA

In January 2009, the Chesapeake Bay Foundation, along with four former government officials, a sport fishing group, and two watermen's associations (Plaintiffs), filed suit against EPA under the citizen's suit provision of the Clean Water Act (CWA) to compel a stronger federal role in the cleanup of the bay. Plaintiffs complained that:

- EPA did not meet his obligation under section 117(g) of the CWA to assure that management plans were developed and implementation begun by C2K signatories to achieve the goals of the agreement;

- in violation of the Administrative Procedure Act, EPA unreasonably failed to timely comply with the Chesapeake Bay agreements and acted arbitrarily and capriciously; and

- the United States has failed to honor its commitments under the Chesapeake Bay agreements, which are enforceable interstate compacts, to achieve and maintain the living resource goals and the water quality goals of reducing nutrient pollution by 40% and removing the bay from the EPA's impaired waters list.

Plaintiffs seek various court orders as relief, including orders requiring the EPA Administrator to comply with the requirements of Section 117(g) of the CWA, and the United States to comply with the terms of C2K.

On July 6, 2009, a group of water associations (the Maryland Association of Municipal Wastewater Agencies, Inc., the Virginia Association of Municipal Wastewater Agencies, Inc.,

the Virginia Municipal Stormwater Association, Inc., and the Storm Water Association of Maryland) filed a motion to intervene as defendants, claiming that as point source dischargers to the Chesapeake Bay, the outcome of the litigation will affect their rights to discharge wastewater and stormwater into the Chesapeake Bay. The interveners seek court orders that require (1) EPA to develop and implement programs to reduce pollution from point sources within the Chesapeake Bay Watershed, and (2) the United States to develop and implement programs to prevent backsliding on point source reductions.

In September 2009, plaintiffs stayed the suit based on the new planned federal role in Chesapeake Bay restoration efforts outlined below.

Chesapeake Bay TMDL

In response to the failure of C2K, and in view of its obligations under the consent decrees, EPA is scheduled to release a TMDL for the Chesapeake Bay by December 2010. Under the consent decrees, EPA was not required to establish this bay-wide TMDL until May 2011, but EPA has accelerated the timeline. The bay-wide TMDL will be an aggregation of smaller TMDLs for the individual tidal Chesapeake Bay segments on the CWA's impaired waters list for 2008. The bay-wide TMDL will address all sources of nitrogen, phosphorus, and sediment pollution to the bay and will create a watershed-wide budget for these pollutants.

Once the watershed-wide pollution budget is created, EPA will allocate load caps to the District of Columbia and all six states in the bay watershed (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia). The District and the states will further divide these allocations among local sources. EPA will then work with the district and the states to create individual state implementation plans (SIPs). Jurisdictions with tributary plans are expected to use the plans to help guide their efforts, but these plans are not expected to be sufficient to allow any state to meet its new obligations.

Implementation of the bay-wide TMDL relies in large part on the jurisdictions' commitments to a series of short-term restoration milestones, described below. There is currently no deadline for achieving the bay-wide TMDL, although there is a deadline, discussed below, for programs implementing the milestones to be in place.

The bay-wide TMDL will include consequences for parties that do not meet their obligations imposed under the regulatory authority granted to EPA under the CWA. EPA has not finalized these consequences yet but is considering a range of options, including (1) assigning more stringent pollution reduction responsibilities to point sources; (2) objecting to state-issued CWA National Pollutant Discharge Elimination System permits; (3) acting to limit or prohibit new or expanded discharges of pollutants; and (4) withholding, conditioning, or reallocating federal grant funds. The key concern with respect to these consequences is whether, and to what extent, EPA will actually impose them on players that are not meeting their obligations.

Milestones

In May 2009 the Chesapeake Bay Executive Council announced that the District of Columbia and the Chesapeake Bay watershed states had committed to new two-year incremental goals called "milestones" to restore the Chesapeake Bay. The milestones set goals for reducing the amount of nitrogen and phosphorus that reaches the bay from each jurisdiction. Notably, the milestones do not include a separate goal for sediment. Once EPA develops the TMDL for the Chesapeake Bay, as discussed above, the milestones will be geared toward achieving the load limits set by the bay-wide TMDL, and may actually merge into the SIPs at some point (although the SIPs will also have a specific sediment limit).

The first set of milestones is scheduled to be achieved by 2011. All programs to implement the milestones are required to be in place by 2025. Maryland has announced that it plans to meet this goal by 2020.

Watershed-wide, the first two-year milestone goals are to reduce:

- nitrogen by 15.8 million pounds (6.1%) below 2008 levels (a 77% increase over the previous rate of reduction); and

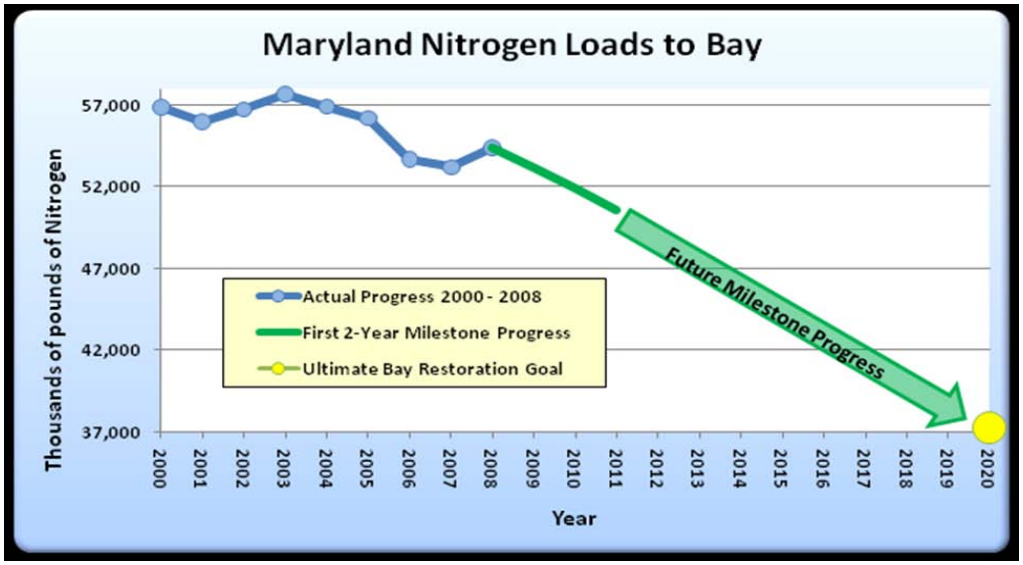
- phosphorus by 1.05 million pounds (5.9%) below 2008 levels (a 79% increase over the previous rate of reduction).

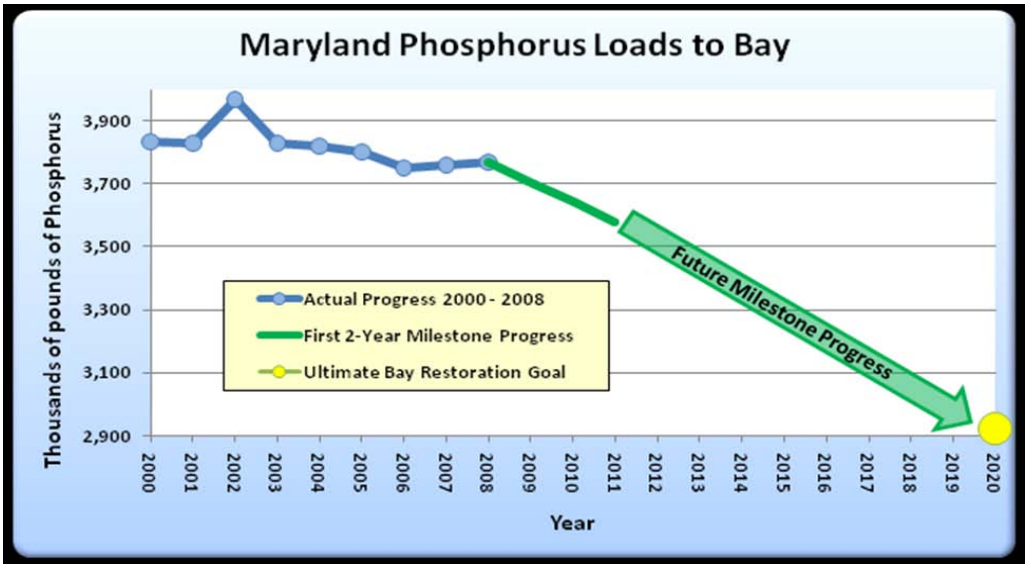
To achieve these milestones, each participating state is allocated its own, state-specific milestones, and is charged with implementing specific, measureable actions to achieve them. For Maryland, as illustrated in **Exhibit 4**, the first two-year milestones are to reduce:

- nitrogen by 3.75 million pounds (6.9%) below 2008 levels (an increase of 138% over the previous rate of reduction); and

- phosphorus by 193,000 pounds (5.1%) below 2008 levels (an increase of 502% over previous rates of progress).

Exhibit 4
Maryland's Pollutant Reduction Goals under the Milestones
Progress toward Meeting those Goals





Note: Loads are based on monitoring data.

Source: Maryland Department of Natural Resources

To achieve these milestones, Maryland plans to implement a suite of 27 actions with specific, measurable targets for nitrogen and phosphorus reduction. The actions fall within one of four major categories:

- implementing best farming practices on agricultural lands;
- reducing pollution from developed lands;
- restoring natural filters on private lands; and
- restoring natural filters on public lands.

Some of these actions will expand on existing programs, while others will require new programs to be created. A breakdown of the actions is shown in **Appendix 1**, including the target amount of pollution reduction each action is intended to achieve and whether or not a new program will be required.

If a state does not meet its milestones at the end of each two-year interval, the state must consult a contingency plan to review the milestones and implement a new plan of action. The milestones are strictly voluntary, and no penalties are triggered by failure. Maryland has already begun to craft a contingency plan for actions that could be taken if the 2011 goals are not met. The plan, still in formulation, includes options such as:

- requiring all new and failing septic systems statewide to be replaced with best available technology;
- establishing a nutrient and sediment cap-and-trade program; and
- increasing funding for the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund.

BayStat will track Maryland's progress toward achieving the milestones and make tracking information available on its website. BayStat advises that it has not been given any additional funding for monitoring and expects to meet its obligations using existing resources.

Executive Order

On May 12, 2009, President Obama signed Executive Order 13508, recognizing the Chesapeake Bay as a national treasure and calling on the federal government to take the lead in renewed efforts to restore the bay and its watershed. The executive order established a Federal Leadership Committee to oversee the development and coordination of bay restoration activities by federal agencies, including data management and reporting. The committee is chaired by the

Administrator of EPA, and includes senior representatives from the federal departments of Agriculture, Commerce, Defense, Homeland Security, Interior, and Transportation.

By September 9, 2009, designated lead agencies were required to prepare and submit draft action reports to the committee making recommendations on specified topics, summarized in **Exhibit 5**. The draft reports have been published and are available at http://executiveorder.chesapeakebay.net/.

Exhibit 5

Agency Action Report Recommendations Required Under the Executive Order

Lead Federal Agency	**Recommendations about How to:**
Environmental Protection Agency	(1) Define the next generation of tools and actions to restore water quality in the Chesapeake Bay, and describe the changes needed in regulations, programs and policies to implement the actions; and (2) develop a stormwater best practices guide for federal facilities and lands within the Chesapeake Bay watershed.
Department of Agriculture	Target resources to better protect the Chesapeake Bay and its tributary waters, including resources under the federal Food Security Act, CWA, and other laws.
Department of Defense	Strengthen stormwater management practices at federal facilities and on federal lands within the Chesapeake Bay watershed.
Department of the Interior	Expand public access to the waters and open spaces of the Chesapeake Bay and its tributaries from federal lands, and conserve the landscapes and ecosystems of the Chesapeake Bay watershed.
Department of the Interior and Department of Commerce (jointly)	(1) Assess the impacts of climate change on the bay, particularly on water quality and the living resources of the bay, and develop a strategy for adapting natural resource programs and public infrastructure to address those impacts; (2) strengthen scientific support for decision-making to restore the bay and its watershed, including expanded environmental research and monitoring and observing systems; and (3) develop focused and coordinated habitat and research activities that protect and restore living resources and water quality of the bay and its watershed.

Source: Executive Order 13508 – Chesapeake Bay Protection and Restoration

By November 9, 2009, the lead agencies were required to submit final recommendations to the committee. The same day, the committee was required to integrate these reports into a draft coordinated strategy for restoration and protection of the Chesapeake Bay. The draft strategy has been published and proposes a suite of federal initiatives to address three main goals: (1) restoring clean water; (2) conserving treasured places and restoring habitat, fish and wildlife; and (3) adapting to the impacts of climate change.

Most notably, in order to restore clean water the draft coordinated strategy would direct:

- EPA to complete the bay-wide TMDL by December 2010;
- states to create detailed implementation plans to achieve the bay-wide TMDL;
- EPA to impose consequences for missed targets;
- EPA to initiate rulemaking to raise national standards for reducing pollution from concentrated animal feeding operations (CAFOs), municipal stormwater, and new or expanded discharges of pollution. However, EPA does not expect to promulgate bay-specific regulations in these areas unless states fail to meet the bay-wide TMDL targets for pollution reduction;
- EPA to implement a compliance and enforcement strategy for CAFOs, stormwater, municipal and industrial wastewater facilities, and stationary and mobile air pollution sources;
- the U.S. Department of Agriculture to launch a voluntary partnership to accelerate the adoption of conservation practices on farms and forests in the bay watershed;
- federal lands and facilities to improve stormwater management; and
- the U.S. Department of Transportation to control pollution runoff on roadways through better planning and design of new roads and retrofitting of existing roads.

Pursuant to the executive order, the committee must publish a final strategy by May 12, 2010. In addition, beginning in 2010, the executive order requires the committee to publish an annual action plan describing how federal funding will be used for bay restoration efforts in the next fiscal year. The action plan will be accompanied by an annual progress report that reviews indicators of bay health and assesses progress on the implementation of the previous year's action plan.

Finally in an effort to provide accountability, the executive order requires the committee to ensure that (1) an independent evaluator periodically reports to the committee on progress under the order; and (2) program evaluation reports are available on a website accessible to the public.

Chapter 3
Implications of the New Framework

Although the new framework for bay restoration is still in its infancy, a preliminary discussion of the potential implications of the new framework follows.

Funding Implications – How Will We Pay for It?

A 2008 report by the University of Maryland's Environmental Finance Center, *The Chesapeake Bay Restoration Trust Fund: Implementing a Sustainable Investment Strategy*, noted an estimated budget shortfall of approximately $5.4 billion to meet the State's Tributary Strategy goals. Similarly, the *Maryland Transition – Work Group Report on Environment and Natural Resources* (January 2007) estimated the cost of implementing all of the actions in the State's tributary strategies to be over $5.0 billion. Prior to the establishment of the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, a 2007 report by the University of Maryland's Environmental Finance Center entitled *Chesapeake Bay Financing Strategy* estimated that the State will need to generate an additional $200 million annually to effectively finance the bay restoration effort. Although a comprehensive funding analysis of what it will take to implement the new framework has not yet been completed, the cost to restore the bay will still be significant.

As shown in **Exhibit 6**, the U.S. Environmental Protection Agency's (EPA) Chesapeake Bay Program notes that $774.0 million in existing State and federal funding will be directed over a three-year period toward reaching the State's first two-year milestones. These sources of funding are not a direct response to the new framework but will be used to achieve the goals of the framework. The total cost is expected to exceed available amounts, however.

Exhibit 6
Sources of Funding in Maryland during the First Milestone Period
(2009 – 2011)

Source	Amount
Bay Restoration Fund	$590.0 million
2010 Trust Fund	$69.6 million
Maryland Agricultural Water Quality Cost Share Program	$17.8 million
Federal Farm Bill	$96.6 million
Total	**$774.0 million**

Source: U.S. Environmental Protection Agency's Chesapeake Bay Program

Restoration projects throughout the watershed are also expected to be funded using funds from the American Recovery and Reinvestment Act of 2009. In June 2009, EPA awarded over $121.6 million in funds under the Act to the Maryland Department of the Environment to help the State and local governments finance improvements to water projects. Of these funds, the Water Quality Revolving Loan Fund, which provides low-interest loans to public entities for wastewater projects, will receive $92.8 million, and the Drinking Water State Revolving Fund, which finances infrastructure improvements for drinking water systems, will receive $26.4 million. The remainder will be used for administrative purposes.

Finally, EPA has requested a funding allocation for federal fiscal 2010 of $35.1 million for its Chesapeake Bay Program. If this request is granted, it will provide an increase of $4.1 million over the federal fiscal 2009 appropriation.

Despite the significant amount of funding already identified, it is clear that a significant funding gap still exists. Thus, it is unclear at this point how the new framework will be successfully executed absent new funding sources. In December 2009, the governors of Maryland and Virginia sent a letter to President Obama requesting $365 million per year in federal aid to implement the Chesapeake Bay restoration strategy called for in the executive order.

Implications for the Relevance of the C2K Goals

The new framework is not meant to sweep away the C2K goals, but to focus restoration efforts on a couple of key indicators and to create a new timeline for achieving a healthy bay.

Unlike C2K, the new milestones do not address broad environmental values (living resource preservation, habitat preservation, land use, etc.) but focus instead on two indicators of water quality: nitrogen and phosphorus. The milestones do not include a specific goal for sediment reduction, although as phosphorus enters the bay by binding to sediment, it may be viewed as encompassed in the goal for phosphorus. Similarly, the bay-wide Total Maximum Daily Load (TMDL) also will not address broad environmental values, although it will likely set a sediment limit. Concerns are being raised about whether the narrow focus of the milestones and bay-wide TMDL on water quality alone will be sufficient to give a true picture of the health of the bay. This shortfall may be tempered by the fact that the milestones and bay-wide TMDL will rely for their achievement on programs developed to meet the broader goals of C2K.

Also unlike C2K, the new framework does not include a final deadline for the achievement of long-term bay restoration goals (such as the bay-wide TMDL). The 2025 milestones deadline only applies to having programs in place to achieve the milestones, not to actually achieving the milestones themselves. While the C2K deadline was not honored, it did provide a measure of accountability. This time around, a hard deadline has not been set, in part in recognition of the often long and unpredictable lag time between the time when a restoration action is implemented and when it begins to have an effect. Under the new framework, this kind

of accountability will come at the end of each two-year milestone period. These short intervals may be beneficial if, as intended, they motivate policymakers and allow more frequent opportunities to adjust efforts as needed. However, because the milestones are voluntary and carry no consequences, they are, in reality, soft deadlines. It remains to be seen how consequences that are developed under the bay-wide TMDL may dovetail with these two-year milestone increments to create more stringent deadlines.

Finally, given the failure of C2K, the feasibility of the accelerated rate of reduction for nitrogen and phosphorus under the milestones is unclear. This is especially so as there is not currently any new major funding source in response to the milestones, and some of the planned actions seem to be simply accounting for activities that were not previously tracked, rather than establishing new programs, as noted in the Appendix.

Implications for Interjurisdictional Cooperation and Federal Oversight

One of the ongoing difficulties in efforts to restore the Chesapeake Bay is the number of interests and jurisdictions in play. The new framework adds a stronger layer of federal oversight into the process. EPA, as the chair of the Federal Leadership Committee and the agency in charge of developing and overseeing the Chesapeake Bay TMDL, will now exert a more clear and significant leadership role. It is hoped that this new federal role will help bridge the gap between divided local interests, much as it did in efforts to restore air quality under the federal Clean Air Act.

Concerns have been raised, however, that so far the new federal role has not emphasized consequences for states that fail to meet restoration goals. Although the bay-wide TMDL will contain enforcement provisions, frequently these provisions are not actually imposed by EPA. As a result, calls have been sounded for federal legislation that would strengthen the federal government's oversight role.

In response to these concerns, on October 20, 2009, Senator Benjamin Cardin introduced the Chesapeake Clean Water and Ecosystem Restoration Act of 2009 (S.1816), in the United States Senate. On the same day, Congressman Elijah Cummings introduced companion legislation (H.R.3852) in the United States House of Representatives. The bills seek to provide teeth to the bay-wide TMDL and milestones as well as additional funding to achieve restoration goals. Notably, the bills:

- require EPA to complete a bay-wide TMDL for nitrogen, phosphorus, and sediment by December 31, 2010, and set a firm deadline of May 2025 for all restoration efforts to be in place. The internal and final deadlines for action coincide with the milestones, and make them a legally binding part of the CWA;

- authorize EPA, if a state does not meet its obligations, to withhold funds available to the state under the CWA, and to develop and administer a federal watershed implementation plan;

- codify President Obama's executive order, requiring action plans across federal agencies to restore the bay;

- require EPA, by May 12, 2012, to develop a cap-and-trade program for phosphorous and nitrogen pollution;

- establish a new $1.5 billion grant program for urban and suburban stormwater control; and

- authorize citizen suits against the states and EPA for failure to act.

Implications for Monitoring and Program Evaluation

Monitoring the health of the Chesapeake Bay is another significant challenge to bay cleanup efforts and is likely to remain so under the new framework. No new funding is currently being allocated to monitoring, nor is any additional monitoring specifically required. As a result, bay restoration efforts will likely continue to rely heavily on modeling efforts, which have been heavily criticized in the past due to concerns about accuracy. However, it does appear that some preliminary efforts are underway within state and federal agencies to align current monitoring efforts with the goals of the milestones. Details of what this might involve are not yet available.

Because the milestones have shorter implementation time frames, the new framework may make it easier to evaluate the effectiveness of individual programs. It is generally hoped that this will allow policymakers to make necessary programmatic adjustments more frequently and to direct limited funding more effectively.

Conclusion

Despite efforts across the watershed, C2K and the bay agreements have failed to restore the Chesapeake Bay to health. The new framework, including the bay-wide TMDL, the milestones, and President Obama's executive order, has focused on establishing a greater federal role in restoration efforts and creating more frequent opportunities to review restoration goals and progress. The new framework pushes back the time frame for bay restoration, but as the deadline under C2K will not be achieved by 2010, as originally intended, this may not constitute a real change. There is reason to hope that the new framework will have a positive effect on interjurisdictional cooperation and real time program evaluation. However, concerns remain

about whether the shorter goal intervals will really result in more accountability and action, and whether funding and enforcement under the new framework will be sufficient to ensure that the new goals are met.

Appendix
Proposed Actions to Reach Maryland's 2011 Milestones

A. Agriculture: Implementing Best Farming Practices

Program	Additional Nitrogen Reductions	% Increased Implementation (from 2008)
Plant 460,00 acres of cover crops	1.37 Million Pounds	156%
Increase Nutrient Management Plan Enforcement on an additional 100,000 acres	311,000 Pounds	9%
Update Soil Conservation and Water Quality Plans on 257,049 acres	159,370 Pounds	22%
Construct Heavy Use Poultry Area Concrete Pads on 400 farms	88,000 Pounds	New Program
Construct 145 Livestock Waste Structures	76,995 Pounds	13%
Construct 200 Water Control Structures	75,000 Pounds	New Program
Implement Dairy Manure Incorporation Technology on an additional 2,500 acres	22,000 Pounds	New Program
Expand Stream Protection with Fencing on an additional 3,000 acres	20,370 Pounds	71%
Expand Manure Transport Program by 10,000 tons	20,000 Pounds	13%
Implement Poultry Manure Incorporation Technology on 2,500 acres	13,000 Pounds	New Program
Construct 53 Poultry Waste Structures	11,130 Pounds	4%
Expand Stream Protection without Fencing on an additional 3,000 acres	10,200 Pounds	9%
Establish 75 Runoff Control Systems	5,175 Pounds	8%
Subtotal	2,182,240 Pounds	

B. Reducing Pollution from Developed Lands

Program	**Additional Nitrogen Reductions**	**% Increased Implementation (from 2008)**
Upgrade 24 Wastewater Treatment Plants to ENR Technology	740,000 Pounds	6%
Implement the Maryland Healthy Air Act	305,882 Pounds	New Program
Upgrade Blue Plains WWTP to Biological Nutrient Removal	190,000 Pounds	New Program
Retrofit Stormwater Management Systems on 90,000 Acres	119,700 Pounds	41%
Required retrofits of 1,080 septic systems in the Critical Area to Best Available Technology	13,133 Pounds	New Program
Retrofit 1,920 failing septic systems outside of the Critical Area to Best Available Technology	10,042 Pounds	703%
Subtotal	1,378,757 Pounds	

C. Restoring Natural Filters on Private Land

Program	**Additional Nitrogen Reductions**	**% Increased Implementation (from 2008)**
Expand streamside grass buffers by 7,000 acres	119,420 pounds	18%
Expand Streamside forest buffers by 3,000 acres	86,160 Pounds	15%
Restore 700 acres of wetlands	20,104 Pounds	8%
Retire 1,800 acres of highly erodible land	17,190 Pounds	12%
Subtotal	242,874 Pounds	

D. Restoring Natural Filters on Public Land

Program	**Additional Nitrogen Reductions**	**% Increased Implementation (from 2008)**
Expand streamside forest buffers by 2,100 acres	60,312 Pounds	New Program
Restore 1,000 acres of wetlands	28,720 Pounds	New Program
Retire 2,000 acres of highly erodible land	19,100 Pounds	New Program
Expand streamside grass buffers by 1,000 acres	17,060 Pounds	New Program
Subtotal	125,192 Pounds	
Total, All Programs	**3,929,063 Pounds**	

Note: The total estimated additional nitrogen reduction from all programs is greater than the milestone goal to account for new sources of nitrogen. The term "new program" includes ongoing actions that are not a direct response to the milestones, but were not previously accounted for under the tracking of progress toward the C2K goals. Percent Increased Implementation relates to the number of acres, farms, structures, tons, systems, plants, or other appropriate unit of measure for each program/activity.

Source: BayStat, Governor O'Malley's Chesapeake Bay Restoration Plan