



2009 STATE OF THE CHESAPEAKE BAY PROGRAM

Summary Report to the Chesapeake Executive Council
May 12, 2009

DIRECTOR'S MESSAGE TO THE CHESAPEAKE EXECUTIVE COUNCIL

On behalf of the entire Program and Partnership, thank you for your leadership of our collective efforts to restore the Chesapeake Bay and her Watershed.

This "State of the Program" Report provides the context for the important work that lies ahead. It summarizes our progress, provides a sobering account of the health of this natural treasure, and frames both the challenges and opportunities.

This is a time of optimism. Bold ideas, new leadership and commitments to action give us confidence we can meet the goals of a vibrant Bay and watershed.

We know the task will not be easy. We must act boldly, learn from the innovative steps of different partners, and enlist the active engagement of local governments, watershed organizations, the private sector and the 16.8 million citizens in the watershed.

Today, the Chesapeake Bay Program Partners have developed aggressive two-year milestones. The milestones and the corresponding actions, reflect Federal and State programs and resources and will accelerate progress to reduce nutrient and sediment pollution . . . the principle cause of water quality problems throughout the Watershed and Bay. These two-year

milestones will help to hold ourselves accountable for near term progress.

We are also encouraged by the prospects of our efforts to set new pollution caps (aka Total Maximum Daily Load or TMDL) and implementation plans throughout the watershed by the end of 2010.

Despite the good work of the "two year milestones," the upcoming TMDL and efforts to enhance performance, transparency and accountability, we still project a significant "gap" between our current progress and the goals for a restored Chesapeake Bay. This gap will need to be addressed by new tools, strategies, authorities and resources that involve all constituents of the Watershed.

Here at Mount Vernon we are reminded that a daunting challenge with a noble purpose can be met when our leaders are committed, our strategies sound and our execution unyielding.

In the words of Thomas Friedman, author of *Hot, Flat and Crowded*, "we have exactly enough time (to restore the Chesapeake Bay and Watershed) . . . starting right now!"

—JEFF LAPE, Director, Chesapeake Bay Program

Our Watershed and Bay—At a Glance

1. The Chesapeake Bay is a national treasure.

- The Chesapeake Bay is one of the most extraordinary places in America. This unique estuary is the largest in the nation.
- The Chesapeake Bay's land to water ratio is 14:1, which is the greatest of any major water body in the world. This means that what happens on the land has a profound effect on the water.
- The 64,000 square mile watershed (see Figure 1) has tremendous ecological, historic, cultural, economic and recreational value to the region and economy with an estimated value in excess of \$1 trillion.
- The Bay Watershed is home to almost 17 million people. About 150,000 people move to the area each year.
- Protecting the Chesapeake Bay begins with protecting the 100,000 streams and rivers that flow into it. Eighty percent of the freshwater comes from the Susquehanna (48%), Potomac (19%) and James (14%) Rivers.



Figure 1. Chesapeake Bay watershed.

Bay and Watershed Health—Water Quality, Habitats, and Fisheries

1. Despite important work that has stemmed human impacts to a significant degree, the health of the Bay is still poor and unacceptable.

- The *Bay Barometer*—the Bay Program's annual Health and Restoration Assessment—was released on March 19, 2009 and affirms that the Bay remains severely degraded, although some parts of the watershed have healthy tributaries. For the first time, the *Bay Barometer* features a single index for health (38 out of 100) and a single index for restoration progress (61 out of 100)—with 100 being a "restored Bay."
- The health assessment is based on extensive monitoring data and tracks progress for discrete ecosystem measures and 13 restoration measures (see Figure 3).

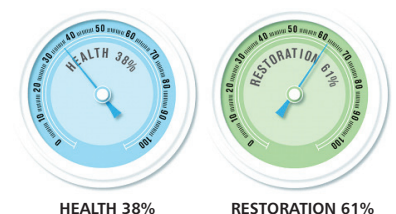


Figure 2. Health and Restoration Indices.

2. The difference between restoration progress (61%) and the health of the ecosystem (38%) reflects the “lag time” between implementation of restoration measures and the ecosystem’s response and recovery.

- Our scientists can determine what measures we need to have in place and the expected environmental benefit (e.g., pounds of pollutants that will be reduced) that is likely to lead to a restored Bay ecosystem. But, they cannot predict how long it will take for the ecosystem to respond to the implementation measures.

3. Independent reports by a number of other groups assessing the health of the Bay and various tributaries and small watersheds affirm the degraded state of the Bay and many of its tributaries (see Figure 4).

- The University of Maryland, Center for Environmental Science issued their annual Report Card on April 2, 2009 and gave the Bay’s health a C-.
- The Chesapeake Bay Foundation issued their State of the Bay Report on April 15, 2009 and ranked the Bay’s health and restoration at 28—the same as last year.
- The network of RiverKeepers has been giving their individual rivers a grade—the Patuxent River (D-), the Severn River (C-) and the Chester River (D) as just a few examples.

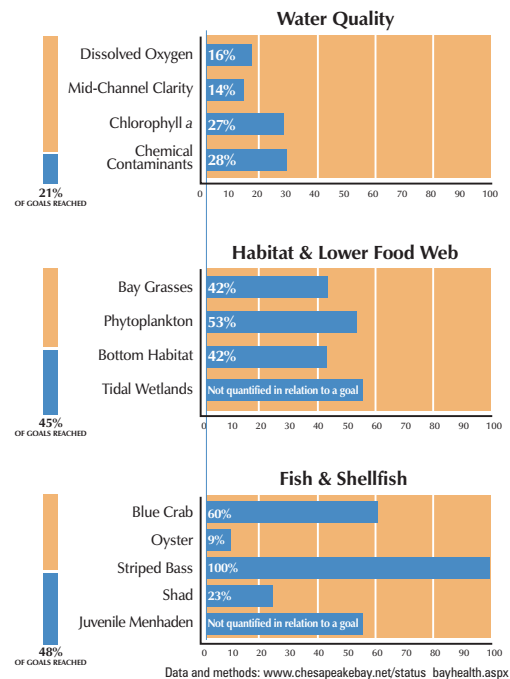


Figure 3. Chesapeake Bay Measures of Health Progress (2008)

Examples of Actions to Improve Water Quality, Restore Vital Habitats, and Protect Fisheries

1. The Bay Program Partners take important actions to restore the Bay and its watershed. “Champions” continue to pursue innovation and implementation. Some examples of recent and upcoming progress and success include:

- Blue crab harvest restrictions put in place last year by Maryland and Virginia already seem to be paying dividends. The most recent survey found 43 percent more blue crabs in the Bay this past winter than a year earlier.
- The Natural Resources Conservation Service (NRCS) is working with the U.S. Geological Survey (USGS), the U.S. Environmental Protection Agency (EPA), and the States to target delivery of an additional \$23 million in new Farm Bill money this year.
- Virginia, as a champion for agriculture, has established a partnership initiative to keep livestock out of streams (see Figure 5).



Figure 4. Several reports all reach the same conclusion—the health of the Bay and its tributaries remains degraded.



Figure 5. Before and after fencing cattle out of this stream.

- Maryland has enacted a new law requiring homeowners to use new nitrogen-reducing technology when replacing or installing new septic systems within 1,000 feet of tidal waters in Maryland.
- New York Governor David Paterson submitted a bill to the legislature to virtually eliminate phosphorus in dishwasher detergent and residentially applied fertilizer.
- The City of Annapolis, Maryland, has banned the sale and use of fertilizer containing phosphorus.
- The Upper Susquehanna Coalition, a local watershed coalition in New York and Pennsylvania, restored 175 acres of non-tidal wetlands on private lands.
- Next month, EPA and the National Fish and Wildlife Foundation will be announcing the issuance of \$12.8 million in grants for innovative nutrient and sediment reduction projects in all seven jurisdictions throughout the Bay watershed.
- The Chesapeake Bay Commission and Pennsylvania reconvened the Biofuels Advisory Panel to review the State Action Plans and assist with implementation. The Panel will call on the jurisdictions to focus on the immediate opportunities (e.g., winter cover crop biofuels, best management practices implementation, on-farm use of biofuels and communications). The Panel will also develop a biofuels production goal; develop agricultural and forest residue removal guidelines for invasive species; and evaluate the potential for sustainable feedstock production within the watershed.

Advisory Committees Provide Critical Advice and Feedback

- 1. The Citizen’s Advisory Committee (CAC), chaired by Jim Elliott (PA), played a critical role in making the case for an external evaluator to independently assess the performance of the Bay Program. CAC was also instrumental in the creation of a new NGO Coalition that will promote advocacy for Bay-related legislation and local level citizen education/involvement and on-the-ground implementation.**
- 2. The Local Government Advisory Committee (LGAC), chaired by Councilman Tommy Wells (DC), has championed the establishment of two circuit rider pilot programs to enhance local government engagement. LGAC is also pressing for active local government involvement in the upcoming Bay TMDL effort.**
- 3. The Scientific and Technical Advisory Committee (STAC), chaired by Doug Lipton (University of Maryland), presented its *Climate Change and the Chesapeake Bay* report last fall and recommends the Bay Program develop a Climate Change Action Plan that recognizes the multiple benefits to the Bay ecosystem by taking action against climate change. STAC is also looking at thresholds and tipping points for Bay restoration activities and resource response.**

TMDL Development and State Implementation Strategies

- 1. EPA and the states have a legal obligation to prepare a “Total Maximum Daily Load” (TMDL) and have agreed to accelerate completion by the end of 2010.**
 - The Bay TMDL—actually a series of up to 92 smaller TMDLs addressing each impaired Bay segment—was prompted by the inability to meet 2010 restoration goals.
- 2. The TMDL is a “diet plan” for the Bay to reduce nitrogen, phosphorus and sediments and meet water quality standards for the Bay.**
 - The Bay TMDL will identify the total pollution caps—essentially the nutrient and sediment diet—necessary to meet states’ Chesapeake Bay water quality standards (dissolved oxygen, water clarity, and chlorophyll *a*).
 - Nutrient and sediment budgets will be allocated by major river basin to all jurisdictions in the watershed—six states and the District of Columbia.
 - States will need to develop state implementation plans (e.g., tributary strategies) to show how the TMDL will be implemented. EPA and the States have clear authorities to address loads from point sources (e.g., wastewater treatment plants). Controls on nonpoint sources are very limited.
- 3. The TMDL development process will be intense through 2010 and beyond.**
 - The major milestones in the TMDL process include:
 - EPA and States agree on watershed pollution loads and allocations—August 2009
 - Public outreach, including with local governments—Summer 2009
 - States develop revised tributary strategies/implementation plans—September 2009 to May 2010

- Public notice of draft TMDL in the Federal Register—June 2010
- Public comment on draft TMDL and draft state implementation plans—June to September 2010
- Final TMDL established by EPA—December 2010
- Consent decree deadline (May 1, 2011).

4. The quality of the science and the model have been substantially enhanced in the last few years.

- The level of detail and precision of the model has been greatly enhanced by the underlying science and continues to be refined based on extensive peer review and model calibration (see Figure 6).
- The state implementation plans can use the latest science to distribute allocations locally and to specific sources, thus improving the ability to target restoration actions.

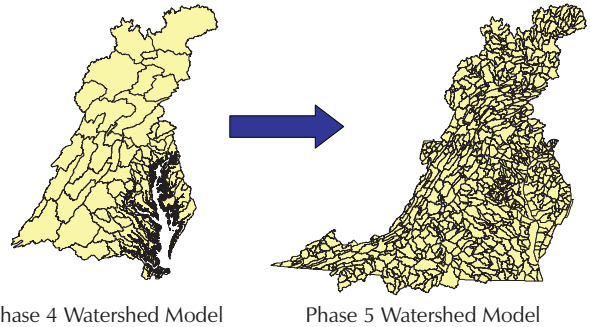


Figure 6. Model refinement has led to better information throughout the watershed.

5. While the total budget caps are expected to be similar to those set in 2003, the new watershed model indicates it will take considerably more effort to meet them.

- Preliminary projections show that the total watershed-wide caps on loads of nitrogen and phosphorus needed to achieve the Bay water quality standards may be relatively close to those set in 2003.
- However, better information on sources, average flows and pollution reduction capabilities, indicates it will take considerably more effort to reach those similar nutrient caps.

6. We expect a sizeable “gap” between where we are and where we need to be. State implementation plans will need to be revised and enhanced to achieve the allocations developed as part of the TMDL.

- There will likely be sizable gaps between the loading reductions from the states’ current tributary strategies and those that will be needed to meet water quality standards.
- Success will require unprecedented cooperation and commitment and greater involvement of the public. Current tools, programs, authorities and resources are inadequate to achieve the needed reductions of nutrients and sediments.

7. As restoration progress is made under the TMDL, segments of the Bay will begin to cascade into attainment with water quality standards. There will be a lag time in most instances between actions taken and Bay response (see Figure 7).

- Partners will begin to see tidal segments come into attainment as pollution reduction actions happen across the watershed.
- Our scientific projections can provide a sense of which segments will respond earlier than others.
- In most instances, there will be a natural lag time before the Bay responds to reduced pollution levels.

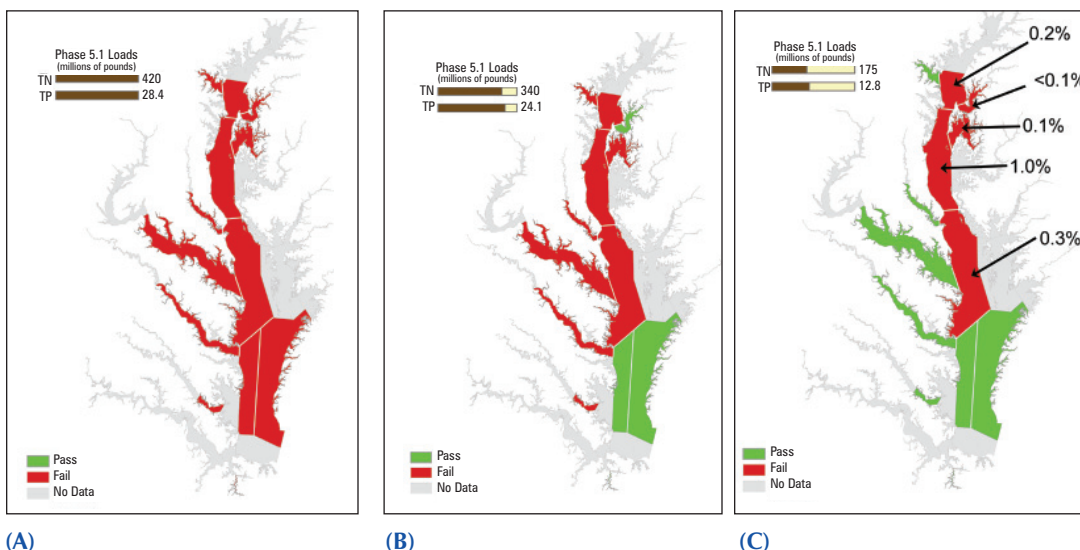


Figure 7. Preliminary model projections for attainment of deep-water dissolved oxygen water quality standards under (A) 1985 loads, (B) late 1990–early 2000 loads and (C) the 2003 basinwide cap loads for nutrients. The model indicates that some segments begin to meet attainment of water quality standards (B) consistent with current monitoring of impaired tidal waters followed by standards attainment projected to be within 1% in the red colored segments under the 2003 cap loads (C) using the current set of models and assessment tools.

Two-Year Milestones

1. At the direction of the Executive Council, the Partners are setting two-year milestones for achieving explicit nutrient and sediment reductions.

- The jurisdictions have a common template for the milestones, including:
 - Explicit load reductions by source
 - Funding sources
 - Quantification of any shortfalls and contingencies to close the gaps.

Key Sources of Nutrients and Sediments

1. The predominant sources of nutrients and sediments are well understood (see Figure 8).

- For nitrogen, the principle sources are agriculture, wastewater treatment plants, air deposition, and polluted stormwater from developed areas.
- Phosphorus is mainly the result of agriculture, wastewater and stormwater from development.
- Agriculture and stormwater from development are the predominant sources of sediments.
- Hatched areas in Figure 8 indicate the sources of nitrogen and phosphorus that are currently regulated by Federal law.

2. In the case of municipal stormwater point sources, while only 17% of the watershed is covered by State/Federal stormwater permits, they do cover about 66% of the impervious surfaces (see Figure 9).

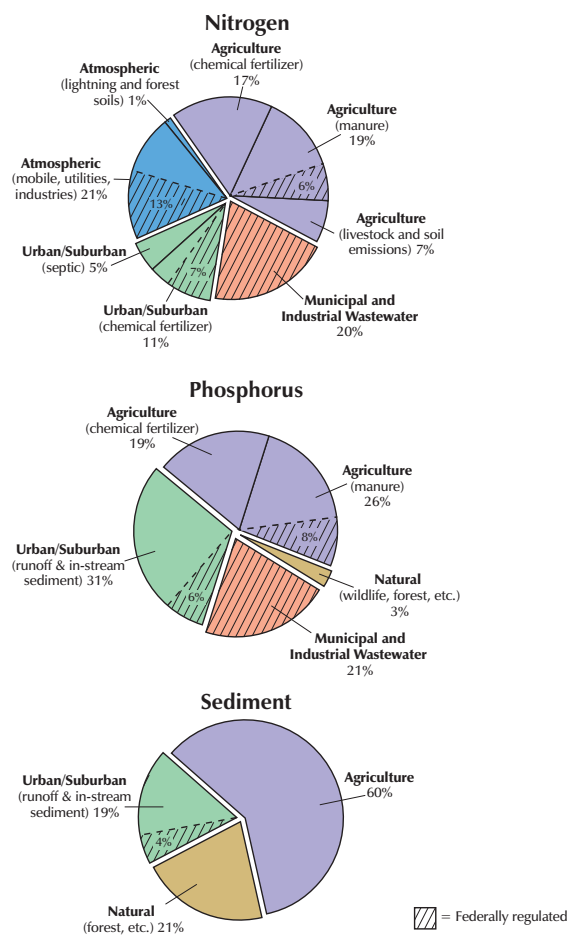


Figure 8. Relative responsibility for pollution loads to the Bay.*
 *Loads from watershed. Does not include loads from direct deposition to tidal waters, tidal shoreline erosion or the ocean. Wastewater loads based on measured discharges; the rest are based on an average-hydrology year.

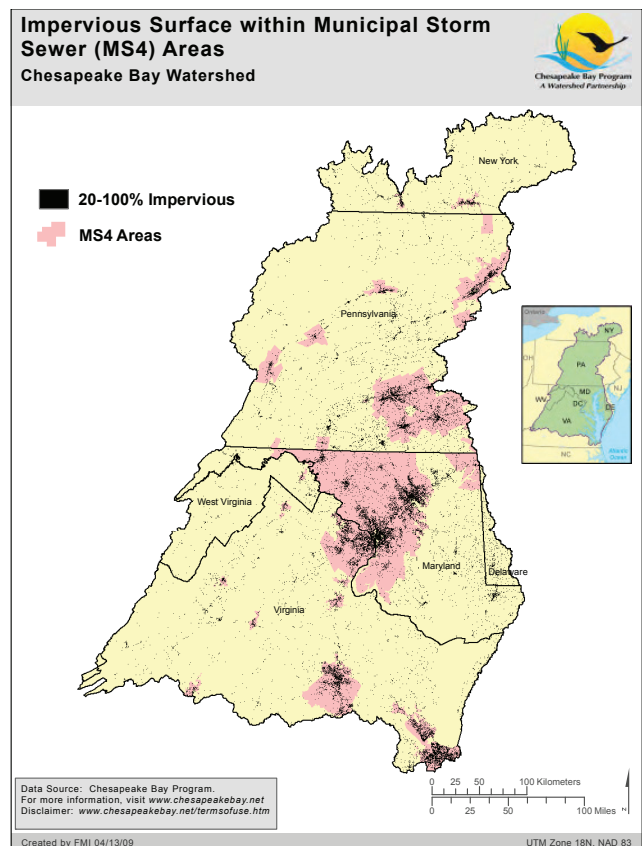


Figure 9. Impervious surface within MS4 Areas.

Important Progress Made to Enhance Performance, Transparency and Accountability

1. The new Bay Program organization structure is aligned with the explicit goals and environmental outcomes of the Program (see Figure 10).

- This provides a clear focus on the goals and outcomes that we are trying to achieve and facilitates strategic program shifts when needed.
- Goal Implementation Teams are led by diverse representation of Federal, State and NGO Partners.
- The new structure is integrated and aligned with the Chesapeake Action Plan.

2. The Chesapeake Action Plan (CAP) is the means to coordinate Partner actions and resources and track and monitor performance.

- The CAP includes a partner accessible database of actions and resources by all six states, D.C., a dozen Federal agencies, and others; sortable by goals, geography, etc., which fosters coordination, collaboration and transparency.
- The CAP includes management dashboards (see Figure 11 for sample) that clearly show progress toward meeting explicit goals. Somewhat modeled on Maryland's BayStat, they show current and expected (annual) progress and summaries of actions and resources.
- With the CAP we can see trends in actions and funding from a multitude of views (e.g., goals, geography, partner, etc.) (see Figure 12).

4. The Bay Program, largely through EPA, continues to respond to and implement over 20 recommendations resulting from program evaluations by the Government Accountability Office, the Office of Management and Budget and six EPA Inspector General reports.

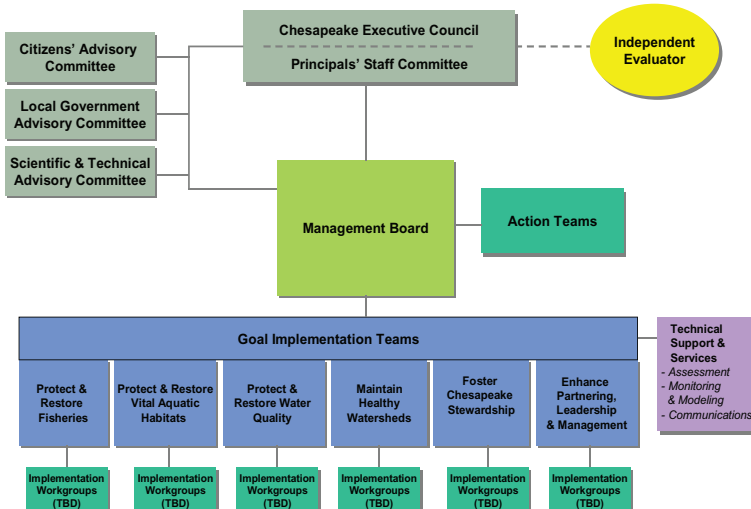


Figure 10. New organizational structure of the Chesapeake Bay Program.

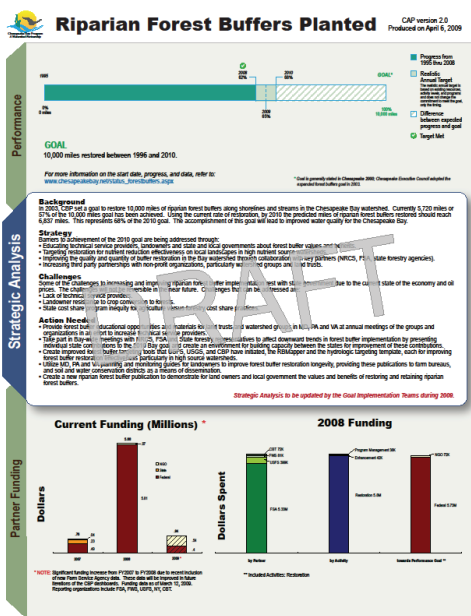


Figure 11. Sample dashboard.

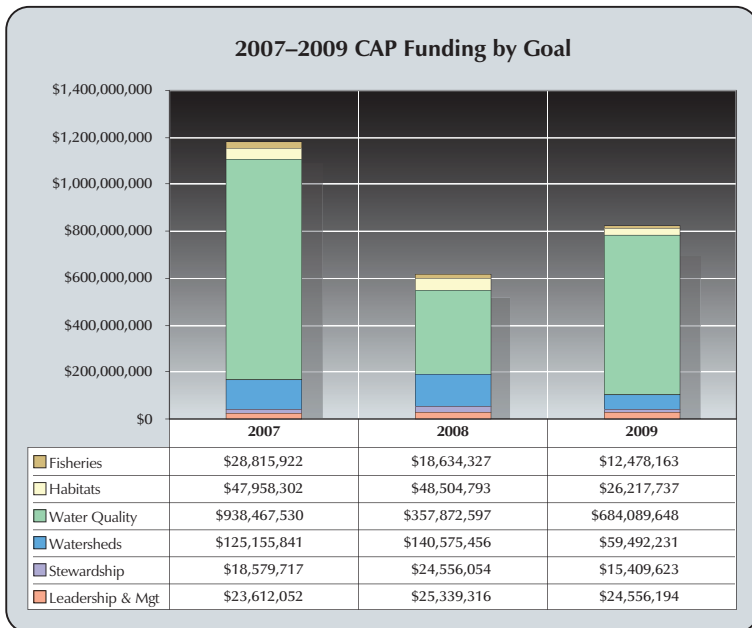


Figure 12. 2007-2009 CAP Funding by Goal.

New Federal Assistance Will Help to Accelerate Implementation

1. *New Farm Bill Funds*—The 2008 Farm Bill allocated \$188 million in mandatory spending for agricultural conservation practices in the Chesapeake Bay watershed portion of the six Bay states.

- Under the strong partnership of the Bay Program, EPA, USGS and the States collaborated with NRCS in prioritizing nutrient reduction practices and targeting agricultural conservation practices in areas with the greatest benefits for water quality.

In January, USDA announced the release of the first year (FY2009) of funding (\$23 million) for its Chesapeake Bay Watershed Initiative:

- Delaware — \$1,278,263
- Maryland — \$5,143,305
- New York — \$1,403,356
- Pennsylvania — \$6,747,749
- Virginia — \$6,976,161
- West Virginia — \$1,451,165.

The rest of the Farm Bill money will be allocated over the next three years:

- FY2010 — \$43 million
- FY2011 — \$72 million
- FY2012 — \$50 million.

2. *American Recovery and Reinvestment Act* is already benefiting the Bay watershed.

- The economic recovery plan signed by President Obama on February 17 provides tremendous funding opportunities to advance restoration in the Chesapeake Bay watershed. From wastewater treatment plant upgrades to habitat restoration and green infrastructure projects, the American Recovery and Reinvestment Act of 2009 offers funding from a variety of Federal agencies with great potential to benefit the Bay and power the economic recovery. A central website, www.recovery.gov, has been established for information on the Recovery Act, and some agencies have their own specific sites—the Bay Program also maintains a web page on the Act (<http://www.chesapeakebay.net/recoveryinvest.aspx?menuitem=34712>).

Congress Contemplates Changes to Chesapeake Bay Program and Related Programs

- The 111th Congress has begun action to consider reauthorization of the Chesapeake Bay Program—Section 117 of the Clean Water Act. For example:
 - Congressman Robert Wittman (R-VA) introduced his bill to promote greater accountability through a Federal cross cut budget and use of adaptive management which was successfully offered as an amendment to H.R. 1262, the Water Quality Investment Act of 2009 which passed the House on March 12 and was referred to the Senate.
 - On April 20, the Senate Subcommittee on Water and Wildlife of the Committee on Environment and Public Works held a field hearing in Annapolis chaired by Senator Ben Cardin (D-MD).
 - On April 23, the Maryland Congressional Delegation, chaired by Senator Barbara Mikulski, held a meeting to focus on Chesapeake Bay issues, including Bay Program reauthorization.
- Congressman John Sarbanes (D-MD) introduced legislation to reauthorize the Chesapeake Bay Office of the National Oceanic and Atmospheric Administration.
- Senator Cardin and Congressman Sarbanes introduced legislation to reauthorize the Chesapeake Bay Gateways and Watertrails Network.

Status of the Chesapeake Bay Foundation Lawsuit

- On January 5, 2009, the Chesapeake Bay Foundation (CBF), joined by other plaintiffs, including retired state and local politicians, filed suit against EPA in U.S. District Court. The suit focuses on three general claims:
 - EPA failed to comply with its Clean Water Act duty to restore the Bay.
 - The Administrative Procedures Act requires EPA to carry out its mission in a timely way.
 - The Chesapeake Bay Program partnership is a federal/interstate compact which makes its signed agreements legally binding.
- EPA and DOJ have conducted preliminary but constructive meetings with CBF to discuss the litigation and possibility of settlement. Discussions are continuing.

Climate Change and the Bay

- The Chesapeake Bay Program's Scientific and Technical Advisory Committee report, *Climate Change and the Chesapeake Bay: State-of-the-Science Review and Recommendations*, released last year, describes the impacts of climate change during the next century:
 - Sea level rise, increased coastal flooding and submergence of wetlands
 - Elevating water temperatures will promote growth of harmful algae, loss of underwater grasses and poorer habitat for native fish and shellfish
 - More erratic climate and weather conditions.
- The report recommends that the Program factor climate change into current and future restoration efforts and develop a Baywide Climate Change Action Plan, since near term Bay restoration actions can also help address the longer term impacts of climate change.
- A recently released EPA report, *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*, shows that many areas around the Bay's shoreline are already witnessing the effects of sea level rise and that vulnerable tidal marshes may erode more rapidly over the next century because of climate change.

The Challenges and Opportunities for a Clean Watershed and Bay

The November 2008 State of the Program Report identified the spectrum of stressors and challenges that impact the Watershed and Bay. All recognize that innovation, advances in technology, changes in behaviors and practices, new tools, expanded use of existing authorities, development of new authorities, and resources are among the suite of approaches that we will need to address these challenges. Below are some examples of the scope of the challenges we face along with some examples of how different partners are addressing these challenges.



Agriculture

Context: Agriculture, primarily animal operations and row crop production, constitute the single largest source of nutrients and sediments to the Bay. Concentrated Animal Feeding Operations (CAFOs) are considered point sources and subject to Federal and State permits, but the remainder of agriculture is largely considered “nonpoint source.” Innovative and voluntary programs (e.g., cost share funding) are used to promote the adoption and implementation of agricultural conservation practices to ensure that water quality impacts are minimized. Despite widespread financial and technical assistance, farmer participation remains below the necessary levels to meet water quality goals. Progress on some conservation practices in the watershed as of 2007 are:

- Nutrient management plans implemented on 50% of agricultural acres
- Conservation tillage practices implemented to reduce erosion on 50% of crop fields
- Conservation plans implemented to minimize water quality impacts on 40% of agricultural acres
- Management practices, such as rotational grazing and stream bank fencing have been implemented on 30% of livestock pastures.

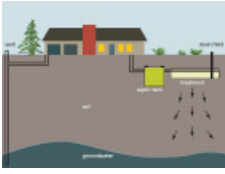
New Paradigm: Through the 2008 Farm Bill, the U.S. Department of Agriculture is focusing new financial resources to priority agricultural watersheds that contribute significant nutrient loads to the Bay. The Commonwealth of Virginia is emphasizing the implementation of five of the most effective priority agricultural conservation practices (nutrient management, conservation tillage, cover crops, riparian buffers, livestock stream exclusion) that will achieve the greatest value for water quality.



Concentrated Animal Feeding Operations

Context: CAFOs are large animal production operations that can generate animal waste equivalent to the human waste produced by a small city. CAFOs are point sources and subject to Federal and State permitting to ensure that animal waste is effectively managed.

New Paradigm: A recent rulemaking by EPA has prompted nearly 800 additional operations in the watershed to seek coverage under Federal or State permits, thus assuring that these facilities will be required to develop and implement nutrient management plans to properly manage animal waste. With a longstanding desire for greater regulatory control, New York regulates CAFOs down to 1/5 the size as that covered by Federal regulations.



Septic Systems

Context: There are an estimated 2.3 million onsite septic systems that provide basic wastewater treatment in the watershed. These systems can be effective, however, they are not intended to remove nitrogen. In fact, septic systems transport about 5% of the nitrogen load to the Bay. Technology advances exist to upgrade existing and new systems for nitrogen removal.

New Paradigm: Maryland has enacted a new law requiring homeowners to use new nitrogen-reducing technology when replacing or installing new septic systems within 1,000 feet of tidal waters in Maryland.



Sewage from Vessels

Context: A Federally-designated no discharge zone (NDZ) is a water body into which the discharge of sewage from all vessels is prohibited. Under Section 312 of the Clean Water Act, vessels with U.S. Coast Guard approved marine sanitation devices (heads) are allowed to discharge treated sewage in areas not formally designated as an NDZ. States can apply to EPA for NDZ designations. There are currently two NDZs in Chesapeake Bay (Lynnhaven River, VA and Herring Bay, MD) and one pending (Deltaville, VA). Combined, these NDZs make up 0.3% of the tidal Chesapeake.

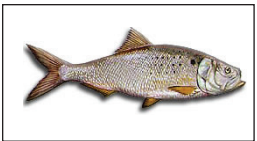
New Paradigm: Delegate Albert Pollard (VA) introduced a Bill in the Virginia Assembly to designate all tidal creeks in VA as NDZs—after EPA approval.



Air Deposition of Nitrogen

Context: Approximately 28 percent of the nitrogen loading to the Chesapeake Bay is from atmospheric deposition. While some is from natural sources, the primary sources are related to burning of fuels (motor vehicles, electric utilities and other industrial, commercial and residential sources).

New Paradigm: EPA is considering the extent that a new Clean Air Interstate Rule and other air rules could foster increased reductions in nitrogen reductions in the Bay.



Menhaden

Context: Atlantic menhaden are a vital link in the Bay’s food chain. It is a prime forage species for striped bass, and also performs a critical function as a filter feeder by consuming excess amounts of phytoplankton.

New Paradigm: There have been discussions among some parties about further restricting the commercial harvest of menhaden for industrial use. A single mature menhaden (about a foot long) can filter approximately four gallons of water per minute, 240 gallons per hour or 5,760 gallons of Bay water per day. A 1967 study published in *Estuaries*, calculated that “if all of the menhaden landed in Chesapeake Bay in one season were present in the Bay at one time, they could filter all of the water in the Virginia portion of the Bay and its tributaries in 24 hours.”



Stormwater from Development

Context: Stormwater runoff from new and existing development is the only source of nutrients and sediments that is actually increasing because of more roads, roof tops, parking lots and other impervious surfaces that transport nutrients and sediments to streams and rivers.

New Paradigm: Section 438 of the Energy Independence and Security Act creates an obligation for Federal agencies to “maintain or restore, to the maximum extent technically feasible the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” This represents a huge opportunity to apply aggressive new stormwater management practices. At the same time, EPA’s Chesapeake Bay Program Office is promoting “no runoff development” as a challenge opportunity.



Phosphorus from Homes

Context: Residents of the watershed contribute phosphorus to the watershed in two ways: through the use of traditional dishwasher detergent, which contains an average of 4-6% phosphorus; and through the application of residential lawn fertilizer.

New Paradigm: Governor Paterson submitted a bill to the New York State Legislature to virtually eliminate phosphorus in dishwasher detergent and residentially applied fertilizer.

Greening our Practices Around the Home

Context: The 16.8 million residents of the watershed all contribute to the nutrient load to the Bay.

New Paradigm: In concert with the this year's *Bay Barometer*, the Bay Program has suggested that residents of the watershed can take explicit steps to reduce their impact on the Bay by adopting practices such as:

- Planting native trees and shrubs
- Not fertilizing lawns
- Installing rain barrels and rain gardens
- Volunteering for a watershed group
- Picking up after your pet
- Driving less
- Using less energy.



Chesapeake Bay Program

A Watershed Partnership

www.chesapeakebay.net