

# BAY BAROMETER

2013 - 2014

## Health and Restoration

in the Chesapeake Bay Watershed



Chesapeake Bay Program  
*Science. Restoration. Partnership.*



## HEALTH AND RESTORATION AT A GLANCE

### YOU CAN HELP

For Chesapeake Bay restoration to be a success, we all must do our part.

Our everyday actions can have a big impact on the Bay. By making simple changes in our lives, each one of us can take part in restoring the Bay and its rivers for future generations to enjoy. Learn more at [www.chesapeakebay.net/takeaction](http://www.chesapeakebay.net/takeaction).

### HEALTH



#### Water Quality

29 percent of the clean water standards were met in the Bay's tidal waters. Three major rivers in the watershed showed long-term improvements in nutrient and sediment concentrations. In the short-term, concentrations remain relatively unchanged.



#### Underwater Grasses

59,927 acres of underwater grasses in the Bay in 2013; an increase from the previous year



#### Blue Crabs

68.5 million spawning-age female blue crabs in the Bay in 2014; a decrease from the previous year



#### American Shad

Rise in spawning shad in some watershed rivers



#### Juvenile Striped Bass

Rise in abundance of juvenile striped bass in the Bay in 2014

### THE CHESAPEAKE BAY is the largest estuary in North America.

Its 64,000-square-mile watershed spans parts of Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia, and all of the District of Columbia.

Thousands of species of plants and animals call the Chesapeake watershed home, with more than 3,600 species living in and around the main Bay alone. This dynamic and productive estuary has played an important role in the region's culture, economy and history and continues to be an important recreational and economic resource today.

### RESTORATION

#### Wetlands

6,098 acres of wetlands established, rehabilitated or reestablished on agricultural lands between 2010 and 2013



#### Forest Buffers

7,994 miles of streamside trees and shrubs planted since 1996



#### Fish Passage

2,576 miles of rivers and streams reopened to migratory fish since 1989



#### Protected Lands

572,000 acres of land permanently protected from development between 2010 and 2013



#### Public Access

36 new sites for the public to enjoy the Bay and its rivers were opened in 2013



#### Reducing Pollution to the Bay and its Tidal Rivers

Between 2009 and 2013, our partners reduced pollution by:

- o Nitrogen: 20.28 million pounds
- o Phosphorous: 2.04 million pounds
- o Sediment: 497 million pounds



### Re-Building Ecosystem Resilience

Resilience—the ability to successfully adapt and endure against the odds—is a quality we see every year in the vast network of living waters and lands that make up the Chesapeake Bay watershed. Each year, the balance between health and degradation continues to be tenuous as the interconnected parts of the ecosystem perpetually shift and change in connection with one another. Their variation shows just how dynamic and complex this ecosystem is.

The Bay Program's scientific indicators, presented here, provide a snapshot of how individual parts of the Bay ecosystem are responding to ongoing challenges and our efforts to protect and repair our natural world. This consistent scientific exploration, in the face of the ever-changing natural factors, provides a basis for clear paths forward in restoration, conservation and protection. With it, Bay Program partners can better understand where and how our work can support and increase the resilience of our lands and waters, adjusting according to need along the way.

How well the region's landscapes and waters endure and continue to offer life-giving services to our communities is up to us. More than thirty years of Bay Program science has shown that people can significantly contribute to degrading or increasing nature's resilience. Where we poorly build and over develop our towns, our local natural environments suffer; where we nurture and restore our rivers and landscapes, our communities thrive. Healthy waters, forests, farmlands, parks and open spaces in our communities depend on the decisions and choices we make at a local level.

With wisdom, caring and perseverance, each of us can be active participants in bolstering the resilience of our local and regional ecosystems and continue to enjoy nature's beauty, bounty and company.

Nick DiPasquale

Director, Chesapeake Bay Program

Resilience: Communities continue to find creative and innovative ways to live on the land and restore their waters.



For more detailed information, visit [www.chesapeakebay.net/trackprogress](http://www.chesapeakebay.net/trackprogress)

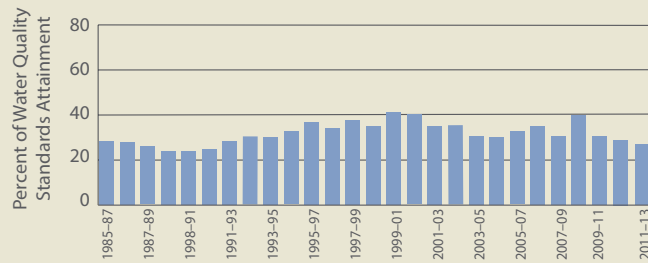
# Watershed Health

What we are seeing



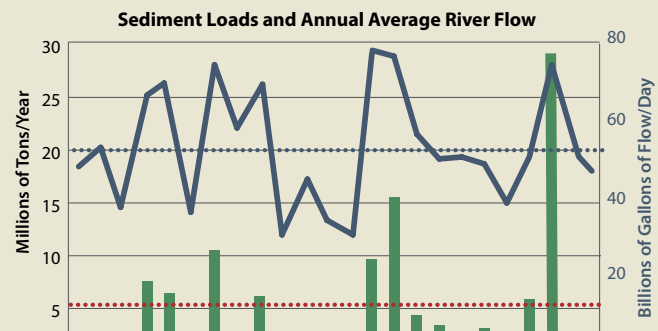
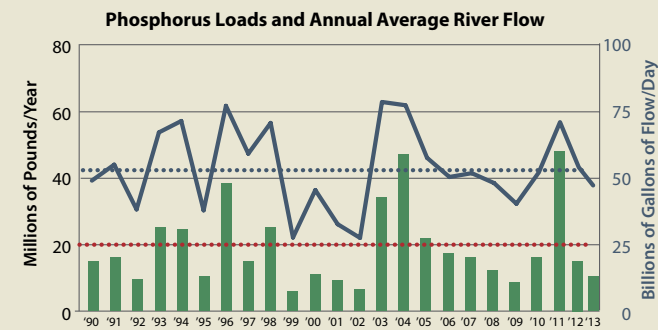
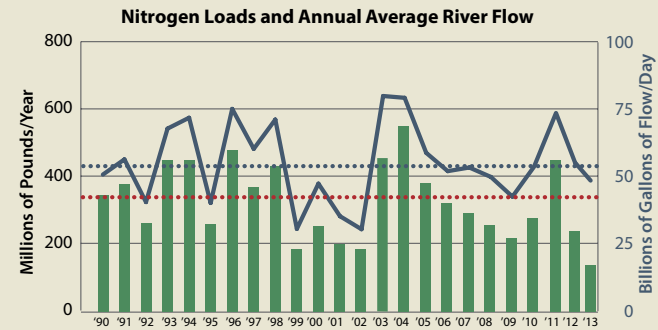
**Bay Water Quality Remains Challenged**

Between 2011 and 2013, 29 percent of the water quality standards for dissolved oxygen, water clarity/underwater grasses and chlorophyll *a* in the Bay and its tidal rivers were met. These results are not significantly different from those of the previous three-year assessment period, during which 31 percent of the clean water standards were met.



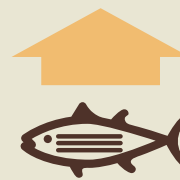
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**Pollution Loads in Rivers Decreased**

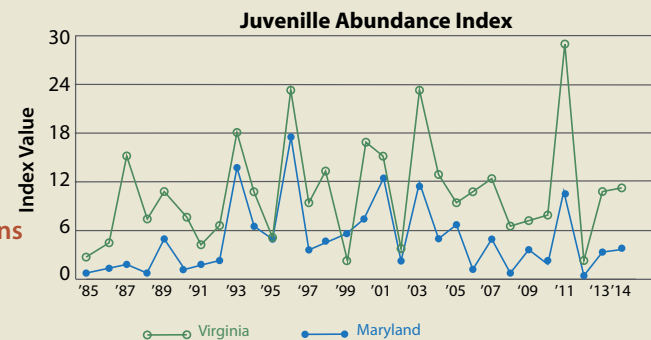


Average Load .....  
Average Flow .....  
River Flow ———

The amount of pollution that flowed from rivers and streams into the Bay during water year 2013 remained below the long-term average. Total river flow was normal, and approximately 160 million pounds of nitrogen, 10 million pounds of phosphorus and 2.71 million tons of sediment reached the Bay from its rivers during this time. While intensified agriculture and development can boost pollution flow, best management practices can lower our growing population's impact on land and water.



**Striped Bass Recruitment Returns to Historic Rates**



Between 2013 and 2014, the abundance of juvenile striped bass in the Bay increased. In Maryland, the striped bass juvenile abundance index—which measures the average number of young-of-the-year rockfish in each seine haul during annual sampling—rose from 3.42 to 4.06. In Virginia, the index rose from 10.92 to 11.37. These index values are about equal to the historic values in each state, and are a significant increase from the low recruitment seen in the region in 2012.

**Resilience: American Shad Recover**

**Chesapeake Bay Program: Working to Protect and Restore the Watershed**

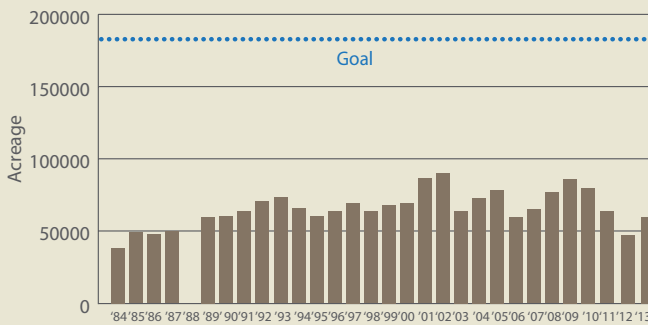
The Chesapeake Bay Program is a regional partnership that works across state lines to protect and restore the Chesapeake Bay watershed. Its partners include the U.S. Environmental Protection Agency, the Chesapeake Bay Commission, the District of Columbia and all six watershed states.

Through the Bay Program, federal, state and local agencies, non-profit organizations, academic institutions and citizens come together to secure a brighter future for the Bay region. But we need your help. Learn about our work, the Bay and our collaborative efforts to restore, protect and conserve this ecosystem at [www.chesapeakebay.net](http://www.chesapeakebay.net)



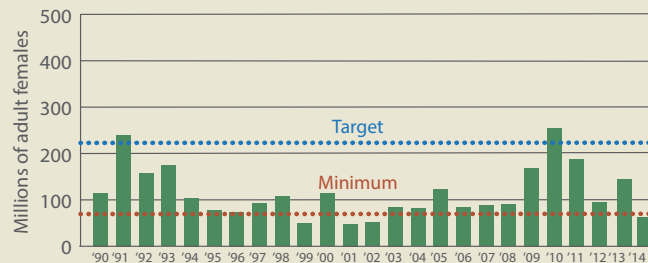
**Underwater Grasses Show Modest Rise**

Between 2012 and 2013, the abundance of underwater grasses in the Bay rose 24 percent. Scientists attribute the increase to an expansion in widgeon grass and a modest recovery of eelgrass. A boost in underwater grasses will improve the entire Bay ecosystem since they reduce shoreline erosion, help sediments settle out, and provide food and habitat for striped bass, crabs and waterfowl.



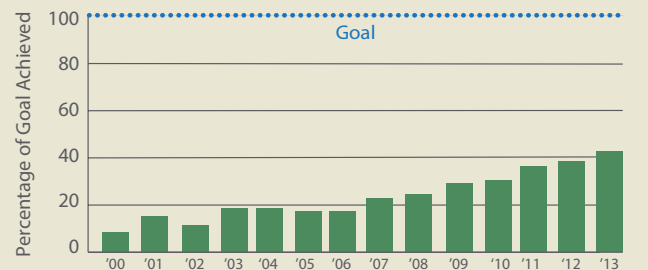
**Female Blue Crabs Depleted**

Between 2013 and 2014, the abundance of spawning-age female blue crabs in the Bay fell 53 percent, from 147 million to 68.5 million. This number is below the 215 million target and the 70 million threshold, which means adult female crabs are in a depleted state. Good water quality, adequate habitat and management that minimizes risks will be essential to sustaining blue crab numbers.



**American Shad Recover in Potomac River**

In 2013, the abundance of American shad in the watershed increased to 41 percent of the goal. This estimate is based on data from the James, Potomac, Rappahannock, Susquehanna and York rivers, where scientists hope to continue increasing spawning stocks of the migratory fish. The overall upward trend for shad is largely driven by the rising shad abundance in the Potomac and York rivers. Shad form an important link in the Bay food web, and good water quality and adequate fish passage are critical to increasing their numbers.



**Challenge: Female Blue Crabs Depleted**

**Bay Barometer**

The Chesapeake Bay watershed is a dynamic system. Across the watershed, rainfall, temperature and other conditions change from month to month and year to year, impacting the surrounding environment. But tracking changes in ecological health over time allows scientists to understand these natural variations as well as the long-term effects of restoration work.

Understanding the effects of our management actions and our progress toward meeting our health and restoration goals requires a complex set of tools, from hundreds of monitoring stations to computer simulations of the entire watershed. These tools helped produce the data in this report, which reflect changes in the Bay watershed over the course of many years.

**Resilience: Bay Grasses Show Modest Rise**

For more detailed information go to [Chesapeakebay.net/track/health](http://Chesapeakebay.net/track/health)



# Watershed Restoration

What we are doing

**Resilience:**  
Oysters show a 92% survival rate in MD



**NEWS: Oyster Recovery**

Though the Bay-wide oyster population remains at historic lows, an annual survey by the Maryland Department of Natural Resources showed the state's oyster population has reached its highest level since 1985. The 92 percent oyster survival rate is due in part to the diseases Dermo and MSX remaining at below-average levels. In Virginia, oyster harvests have increased more than ten-fold in the last 12 years.

**NEWS: Bay Dead Zone**

The duration of the Chesapeake Bay's annual "dead zone" has declined over time from five months to four months, although its size and severity have not.

**NEWS: Local Restoration Projects Watershed-wide**

In the Chesapeake Bay region, 45 environmental projects received \$9.8 million from the National Fish and Wildlife Foundation's Chesapeake Bay Stewardship Fund. These projects reflect many local government and non-profit restoration efforts and range from marsh, wetland and forest buffer restoration to the installation of pollution-reducing practices.



**Wetlands Restored**

2013: **287 acres established, rehabilitated or reestablished** on agricultural lands  
**Total since 2010: 6,098**

Wetlands trap pollution, slow erosion, protect properties from floods and provide critical habitat to wildlife. Land purchases and conservation easements continue to protect wetland habitat, while the removal of invasive species rehabilitates degraded wetlands.



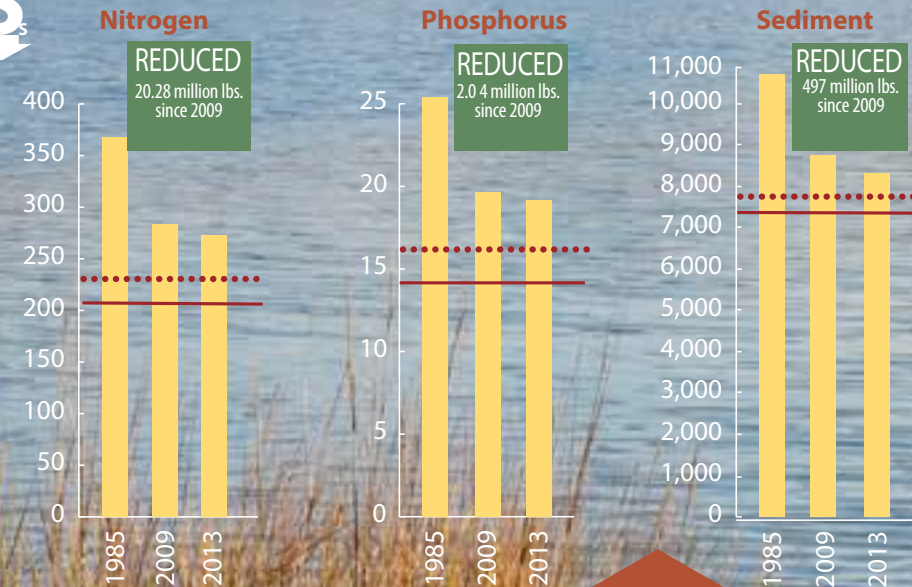
**Lands Protected**

2010-13: **572,000 acres**  
**Total: 8,371,682**

Conserved lands protect water quality, sustain fish and wildlife, maintain working farms and forests, preserve our history, and provide opportunities for outdoor recreation. Approximately 21 percent of the land (8,371,682 acres) in the Chesapeake Bay watershed has been permanently protected from development.



Total Pollution Loads to the Bay in millions of pounds/year (Estimated)



**Estimated Pollution Reduced**

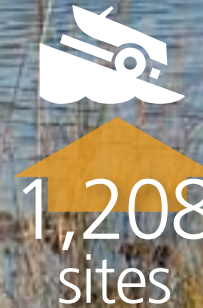
2009 - 2013: 20.28 million pounds of nitrogen, 2.04 million pounds of phosphorous and 497 million pounds of sediment reduced

Over the last four years, pollution controls put in place by Chesapeake Bay Program partners have led to further reductions in nutrients and sediment entering the Chesapeake Bay. Between 2009 and 2013, our estimates show that nitrogen loads to the Bay fell 7 percent, phosphorous loads fell 11 percent and sediment loads fell 6 percent. As a whole, reductions in phosphorous and sediment are on track, but efforts to reduce nutrient and sediment pollution from urban streets, farm fields and onsite septic systems are lagging behind. These decreases move us closer to achieving our overall targets for reducing pollution.

**Forest Buffers Planted**

2013: **229 miles planted**  
**Total since 1996: 7,994 miles**

Streamside trees and shrubs, also known as riparian forest buffers, stabilize shorelines, remove pollutants from runoff and shade streams for brook trout and smaller creatures that thrive in cool temperatures and clean waters. Forest buffers are essential to healthy stream habitats.



**Public Access Established**

2013: **36 sites opened**  
**Total: 1,208 sites**

Increasing public access to open space and waterways strengthens the bond between people and place, boosting local economies and creating citizen stewards who are engaged in conservation work.

**Oyster Reefs Being Built**

2014: **6 tributaries selected for restoration**

Oysters are filter-feeders that help clean the Bay's waters; the reefs that they form also create valuable habitat for many bottom-dwelling creatures. In 2010, our partners embarked on a tributary-based strategy to restore oyster reefs in Maryland and Virginia waterways. As of February 2014, six tributaries have been selected for restoration. Reefs have been built and seeded on almost 190 acres in Harris Creek, and restoration plans have been drafted for the Little Choptank and Tred Avon rivers.



**NEWS: Habitat Restoration**

The U.S. Fish and Wildlife Service determined that for every federal dollar spent, \$7 to \$9 of restoration work happens on the ground and almost \$2 of economic activity is gained by the state in which the work takes place.



**NEWS: Wastewater Treatment**

Wastewater treatment plant upgrades in Maryland, Virginia and the District of Columbia led to decreased nutrient concentrations, improvements in bay grasses and reduced dead zone periods in the Potomac, Patuxent and Back rivers.



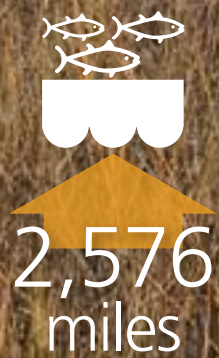
**NEWS: Air Pollution**

The Clean Air Act's Acid Rain Program led to a 32 percent reduction of power plant emissions in the mid-Atlantic from 1997 to 2005, which has improved water quality in the Chesapeake region.



**NEWS: Agricultural Runoff**

Researchers found best management practices that reduce polluted runoff from farmland, such as planting cover crops, managing manure and excluding cattle from rivers and streams, can improve the quality of local waters in as little as one to six years.



**Fish Passage Reopened**

2013: **33 miles restored**  
**Total since 1989: 2,576 miles**

Installing fish ladders, lifts and other passageways or removing dams, culverts and other barriers allow migratory fish to reach their upstream spawning grounds.

For more detailed information go to [www.chesapeakebay.net/track/restoration](http://www.chesapeakebay.net/track/restoration)



Restoration,  
Conservation &  
Protection into the  
Future:

*the Chesapeake Bay  
Watershed Agreement*

In June 2014, the Chesapeake Executive Council—a body of top-level leaders representing the seven watershed jurisdictions, a tri-state policy group and federal agencies—signed the *Chesapeake Bay Watershed Agreement*, committing the Chesapeake Bay Program partners to a set of interrelated goals to advance the restoration, conservation and protection of the Bay, its tributaries and the lands that surround them.

*Chesapeake Bay  
Watershed Agreement*

This is the most inclusive, collaborative, goal-oriented agreement the Chesapeake Bay Program has ever had for guiding its efforts, highlighted by new levels of participation from the three headwater states and the public. It contains ten goals and thirty-one measurable, time-bound outcomes that will help create a healthy watershed by: lowering nutrient and sediment pollution; ensuring our waters are free of toxic contaminants; sustaining blue crabs, oysters and forage fish; restoring wetlands, underwater grass beds and other habitats; conserving farmland and forests; boosting public access to and education about the Bay and its tributaries; and increasing the climate resiliency of the watershed's resources, habitats and communities. In addition to addressing these water quality and land use challenges, it also confronts critical emerging issues—environmental literacy, toxic contaminants and climate change. Finally, it challenges us to build upon the strength of our diverse communities and citizenry, calling to action all of the nearly 18 million people that call our watershed home.

For more, visit [www.chesapeakebay.net/watershedagreement](http://www.chesapeakebay.net/watershedagreement). The plans for achieving the *Chesapeake Bay Watershed Agreement* goals and outcomes are now being written. To join in this process, visit [www.chesapeakebay.net/managementstrategies](http://www.chesapeakebay.net/managementstrategies).

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