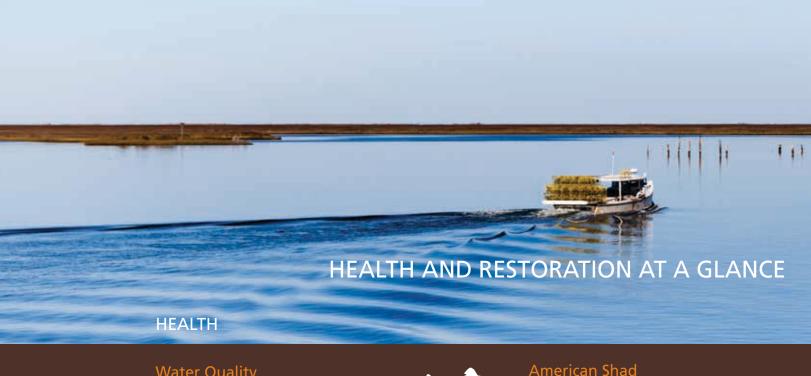


Chesapeake Bay Program *Science. Restoration. Partnership.* 





### **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.



Rise in spawning shad in some watershed rivers



### **Juvenile Striped Bass**

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



### **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



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.



## Resilience:

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





### 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:

- Nitrogen: 20.28 million pounds
- Phosphorous: 2.04 million pounds
- 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.

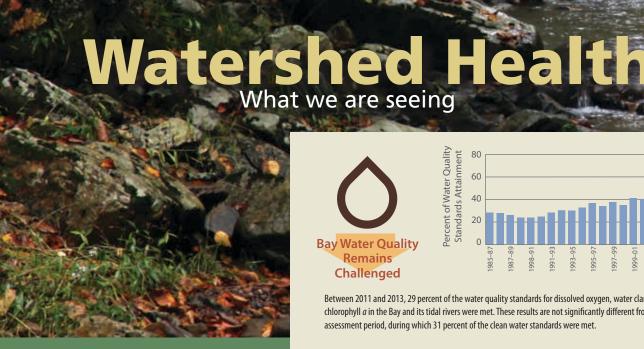
How well the region's landscapes and waters endure and continue to offer life-giving services to our communities is up to us. More than thirty years of Bay Program science has shown that people can significantly contribute to degrading or increasing nature's resilience. Where we poorly build and over 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.

Mick DiFasquale
Nick DiPasquale

Director, Chesapeake Bay Program

For more detailed information, visit www.chesapeakebay.net/trackprogress



## 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

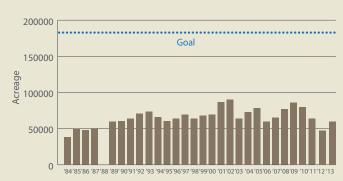






Between 2011 and 2013, 29 percent of the water quality standards for dissolved oxygen, water clarity/underwater grasses and chlorophyll a in the Bay and its tidal rivers were met. These results are not significantly different from those of the previous three-year assessment period, during which 31 percent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





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.





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.

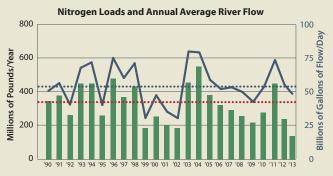


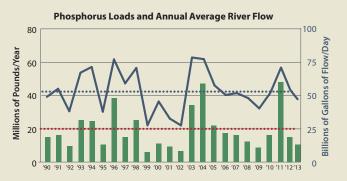
Percentage of Goal Achieved 60

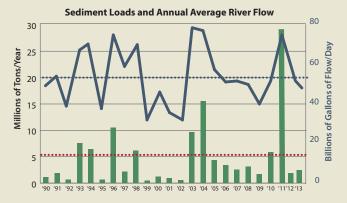
In 2013, the abundance of American shad in the watershed increased to 41 percent of the goal. This estimate is based on data from the James, Potomac, Rappahanock, Susquehanna and York rivers, where scientists hope to continue increasing spawning stocks of the migratory fish. The overall upward trend 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.



# Pollution Loads in Rivers Decreased



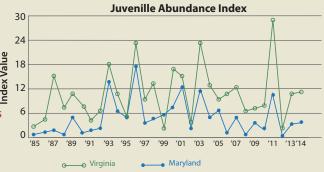




Average Load •••••
Average Flow •••••
River Flow

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.





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.



## 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

# Watershed Restoration

What we are doing

Resilience: Oysters show a 92% survival rate in MD

6,098 acres

### 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.



Total since 1996: 7, 994 miles



### Fish Passage Reopened

2013: 33 miles restored

Installing fish ladders, lifts and other passageways or fish to reach their upstream spawning grounds.



### **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.



2013: 229 miles planted

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.



miles

**Total since 1989: 2,576 miles** 

removing dams, culverts and other barriers allow migratory



sites

### **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.

For more detailed information go to Chesapeakebay.net/track/restoration



### **NEWS: Oyster Recovery**

Though the Bay-wide oyster population remains at historic lows, an annual survey by the Maryland Department of Natural esources 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.

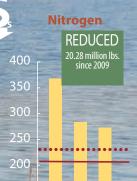
### **NEWS: Local Restoration Projects Watershed-wide**

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 pollutionreducing practices.



150

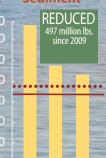
Total Pollution Loads to the Bay in millions of pounds/year (Estimated)



### **Phosphorus**



### **Sediment**



### **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.

2017 Interim Targe

2025 Planning Target (amt. allowed in Bay

Percent of Target Achieved 2009-2013

Nitrogen 27% Phosphorus 43% Sediment 37%



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.



**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.



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



**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.









