CHESAPEAKE BAY PROGRAM 2016-2017
BAY BAROMETER

HEALTH & RESTORATION
IN THE CHESAPEAKE BAY WATERSHED

BAY BAROMETER

The Chesapeake Bay watershed is a dynamic ecosystem. Tracking changes in its health over time allows scientists to understand the effects of our management actions, as well as our progress toward meeting our health and restoration goals. The data in this report reflect just some of the conditions we monitor to better understand the Bay and how we might protect and restore it.

THE CHESAPEAKE BAY PROGRAM

The Chesapeake Bay Program is a regional partnership that works across state lines to protect and restore the Chesapeake Bay watershed. Our partners include the U.S. Environmental Protection Agency, the Chesapeake Bay Commission, Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia. 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. Learn more at www.chesapeakebay.net.

THE CHESAPEAKE BAY WATERSHED AGREEMENT

The Chesapeake Bay Program is guided by the goals and outcomes of the *Chesapeake Bay Watershed Agreement*. Signed on June 16, 2014, this agreement commits our partners to protecting and restoring the Bay, its tributaries and the lands that surround them. Our environment is an interconnected system, and achieving the goals and outcomes of this agreement will support improvements in the health of the watershed and the people who live here. Track our progress toward this agreement at www.chesapeakeprogress.com.

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ABUNDANT LIFE

SUSTAINABLE FISHERIES

BLUE CRAB ABUNDANCE

OUTCOME

Maintain a sustainable blue crab population based on a target of 215 million adult females.

Over 100 percent of outcome achieved.

THE DATA

ADULT FEMALE BLUE CRAB ABUNDANCE

Population (Millions)

Year	Value
2007	89
2008	91
2009	162
2010	246
2011	191
2012	95
2013	147
2014	69
2015	101
2016	194
2017	254
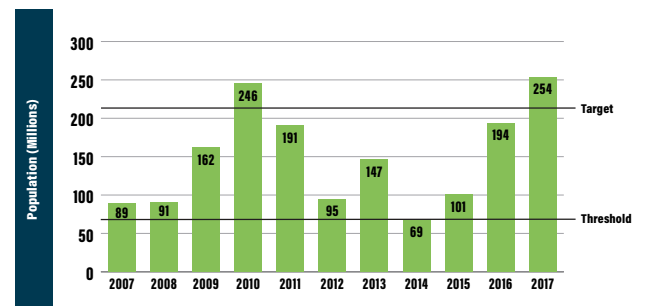
Target

Threshold

Between 2016 and 2017, the abundance of adult female blue crabs in the Chesapeake Bay rose 31 percent from 194 million to 254 million. This number is above the 70 million threshold and the 215 million target, and marks the highest amount ever recorded by the Bay-wide Blue Crab Winter Dredge Survey.

BLUE CRAB MANAGEMENT

OUTCOME

Manage for a stable and productive blue crab fishery. By 2018, evaluate the establishment of a Chesapeake Bay-wide allocation-based management framework.

The blue crab stock is not depleted and overfishing is not occurring.
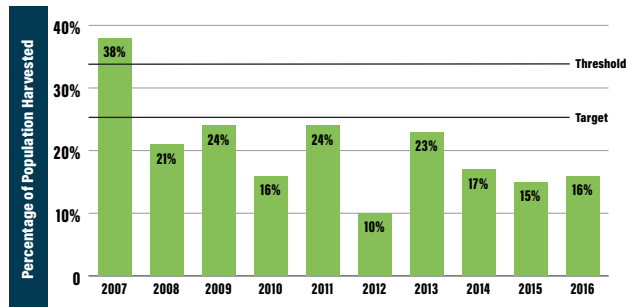
THE DATA

FEMALE BLUE CRAB HARVEST

In 2016, an estimated 16 percent of female blue crabs were harvested from the Chesapeake Bay. For the ninth consecutive year, this number is below the 25.5 percent target and the 34 percent overfishing threshold. Experts have determined the blue crab stock is not depleted and overfishing is not occurring.

DID YOU KNOW?

In 2017, the three jurisdictions that manage the Chesapeake Bay's blue crab fishery decided not to establish an allocation-based management framework, which would have assigned Maryland, Virginia and the Potomac River Fisheries Commission a portion of an annual "total allowable catch" of male and female crabs. The decision to continue to operate under a science-based management framework was based on jurisdictional perspectives and stakeholder feedback.

FISH HABITAT

OUTCOME

Identify and characterize critical fish and shellfish spawning, nursery and forage areas within the Chesapeake Bay and its tributaries. Integrate information and conduct assessments to inform restoration and conservation efforts.

DID YOU KNOW?

Smithsonian Environmental Research Center scientists and their collaborators collected more than 600,000 organisms at 587 sites in the Chesapeake Bay and Delaware Coastal Bays to investigate the impacts land cover and shoreline hardening can have on estuarine species. Findings indicate that fish and crustacean abundance is lower in areas near hardened shorelines, highlighting the importance of living shorelines, the conservation or restoration of coastal wetlands, and other alternatives to traditional shoreline hardening.

FORAGE FISH

OUTCOME

Improve our capacity to understand the role of forage fish in the Chesapeake Bay. By 2016, develop a strategy for assessing the forage base available as food for predatory species.

DID YOU KNOW?

New research from the University of Maryland Center for Environmental Science finds evidence that fish and invertebrate forage abundance in the Chesapeake Bay and its tributaries is closely linked to annual climate. An emerging pattern suggests that cooler springs can set the stage for higher forage abundance the following summer. Freshwater flow also appears to impact forage species, with a positive relationship between the volume of spring flow and the abundance of anadromous forage fish and some invertebrate forage species. Evidence also shows the diet of predatory fish can change based on a fish's location, and is correlated with some of the same climate indicators that impact forage abundance. These findings suggest a "bottom-up" link between climate conditions, forage abundance and, ultimately, the diet of predatory fish in the Chesapeake Bay.

OYSTERS

OUTCOME

Increase finfish and shellfish habitat and the water quality benefits afforded by restored oyster populations. Restore native oyster habitat and populations in 10 tributaries by 2025 and ensure their protection.

Restoration is underway in six tributaries.

THE DATA

Oyster Reef Restoration Progress Dashboard				
Tributary	Tributary Restoration Plan	Reef Construction & Seeding	Monitoring & Evaluation	Completed/Target Acreage (2016)
Harris Creek (Md.)	Complete	Complete	In Progress	350/350
Tred Avon (Md.)	Complete	In Progress		35/147
Little Choptank (Md.)	Complete	In Progress		178/440
Piankatank (Va.)	In Progress	In Progress		25/TBD
Lynnhaven (Va.)	In Progress	In Progress		63/TBD
Lafayette (Va.)	In Progress	In Progress		70.5/80

Each of the six tributaries that have been selected for oyster restoration is at a different level of progress in a process that involves developing a tributary restoration plan, constructing and seeding reefs, and monitoring and evaluating restored reefs. While reef monitoring and evaluation will determine success in meeting this outcome, these steps will not be complete until after 2025, as a tributary must be monitored in three– and six-year intervals after reef construction and seeding are complete before it can be deemed restored. Monitoring and evaluation began in Harris Creek in 2015, where many of the reefs seeded in 2012 and 2013 are meeting the criteria for success in oyster weight and density and serving as home to oysters of different ages, which indicates a healthy oyster population. In Maryland tributaries, 563.9 acres of oyster reefs are considered complete. In Virginia tributaries, 158 acres of oyster reefs are considered complete. Some of these reefs have undergone restoration as part of our progress toward this outcome, while others have undergone previous restoration work or, due to naturally occurring reefs and oysters, already meet our restoration criteria.
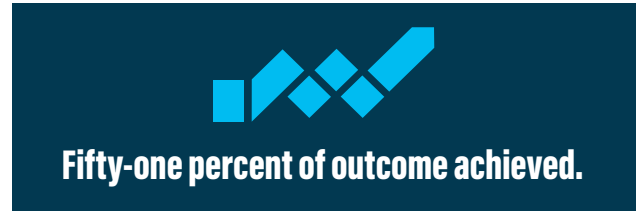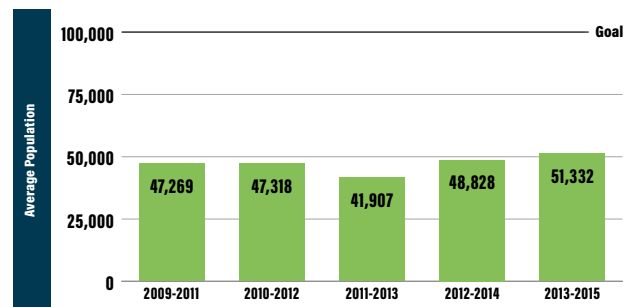
VITAL HABITATS

BLACK DUCK

OUTCOME

By 2025, restore, enhance and preserve wetland habitat to support a wintering population of 100,000 black ducks.

Fifty-one percent of outcome achieved.

THE DATA

WINTERING BLACK DUCK POPULATION

The U.S. Fish and Wildlife Service conducts a Mid-winter Waterfowl Survey each January to determine the abundance and distribution of several species of waterfowl. According to survey results, an average of 51,332 black ducks were observed in Chesapeake Bay watershed states between 2013 and 2015. This marks a five percent increase from the average number of black ducks observed in the region between 2012 and 2014 and 51 percent of the 100,000 bird goal.

DID YOU KNOW?

The mid-Atlantic region supports the largest population of wintering black ducks in eastern North America. In 2017, Chesapeake Bay Program partners launched a Black Duck Decision Support Tool to guide on-the-ground habitat conservation for this critical species. The tool uses current landscape conditions and expected land use change to identify high-quality, resilient habitat and target areas for restoration and protection, helping conservation practitioners prioritize black duck projects.

BROOK TROUT

OUTCOME

Restore and sustain naturally reproducing brook trout in the Chesapeake Bay's headwater streams, with an eight percent increase in occupied habitat by 2025.

FISH PASSAGE

OUTCOME

Increase habitat to support sustainable migratory fish populations in the Chesapeake Bay watershed's freshwater rivers and streams. By 2025, restore historical fish migration routes by opening 1,000 additional stream miles to fish passage.

Over 100 percent of outcome achieved.

THE DATA

STREAM MILES OPENED TO FISH PASSAGE (CUMULATIVE)
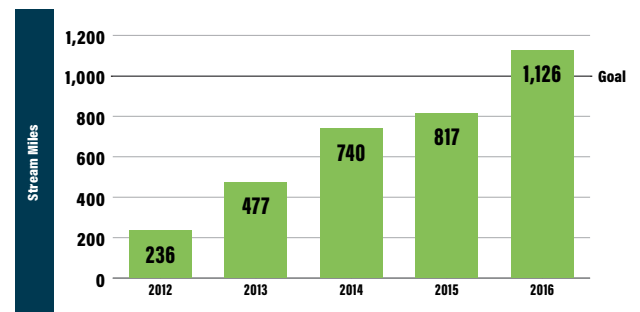
Progress to restore historical fish migration routes is measured against a 2011 baseline of 2,510 stream miles open to the migration of fish. Between 2012 and 2016, 1,126 additional miles were opened to fish passage, including 565 miles in Virginia, 538 miles in Pennsylvania and 22.6 miles in Maryland. This marks a 113 percent achievement of the 1,000-mile goal.

FOREST BUFFERS

OUTCOME

Increase the capacity of forest buffers to provide water quality and habitat benefits throughout the Chesapeake Bay watershed. Restore 900 miles of riparian forest buffers per year and conserve existing buffers until at least 70 percent of the watershed's riparian areas are forested.
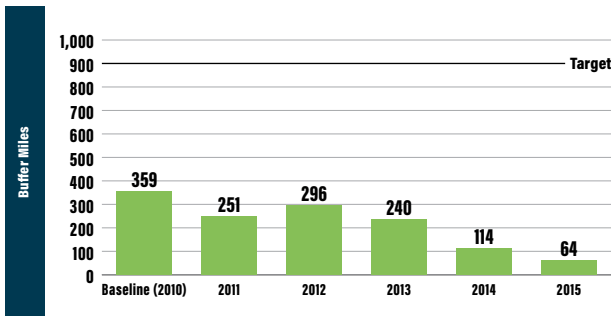
Seven percent of annual target achieved.

THE DATA

FOREST BUFFERS PLANTED (ANNUALLY)

Year	Buffer Miles
Baseline (2010)	359
2011	251
2012	296
2013	240
2014	114
2015	64

Target: 1,000 (Buffer Miles axis: 0–1,000)

In 2015, about 64 miles of forest buffers were planted along the Chesapeake Bay watershed's rivers and streams. While this marks some progress toward the outcome, it is significantly less than progress made in past years: at 836 miles below the 900-mile-per-year goal, it is the lowest restoration total of the last 16 years. An estimated 55 percent of the watershed's 288,000 miles of stream banks and shore-lines currently have forest buffers in place, and our partners will plant new buffers and conserve existing buffers until at least 70 percent of these areas are forested.

DID YOU KNOW?

The Chesapeake Riparian Forest Buffer Network, www.chesapeakeforestbuffers.net, was launched in March 2017 through a partnership between the Chesapeake Bay Program Forestry Workgroup, the Alliance for the Chesapeake Bay and the U.S. Forest Service to help communities meet their forest buffer goals. The website features an interactive map showing the progress of counties in enrolling landowners across the watershed in forest buffer programs, as well as educational information and resources on outreach strategies and funding opportunities.
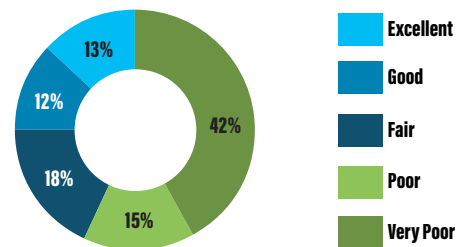
STREAM HEALTH

OUTCOME

Improve the health and function of ten percent of stream miles above the 2008 baseline.

Forty-three percent of streams in fair, good or excellent condition.

THE DATA

Stream Health (2000-2010): Average Chessie BIBI Scores of 10,000+ Sampling Sites

Category	Percent
Excellent	13%
Good	12%
Fair	18%
Poor	15%
Very Poor	42%

Over the last decade, thousands of stream samples have been collected to help us determine the physical, chemical and biological health of our waterways and to generate a Chesapeake Bay-wide indicator of stream health. In 2010, this indicator—known as the Chesapeake Bay-wide Index of Biotic Integrity or Chessie BIBI—ranked 43 percent of streams in fair, good or excellent condition and 57 percent in poor or very poor condition. Experts are working to refine the Chessie BIBI and update the index with more recent data representative of stream miles within the Bay watershed.
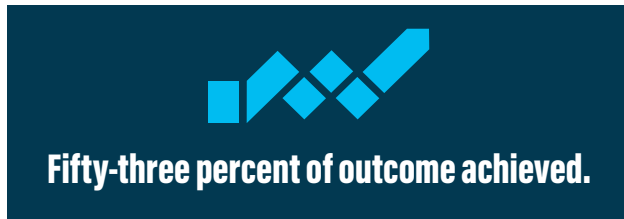
DID YOU KNOW?

The Steam Health Workgroup will bring together scientists and managers to come to a consensus on a practical base-line for the Chesapeake Bay-wide Index of Biotic Integrity, or the indicator used to measure stream health. Establishing this baseline is necessary to measure progress toward the Stream Health Outcome and gauge the effectiveness of management actions.
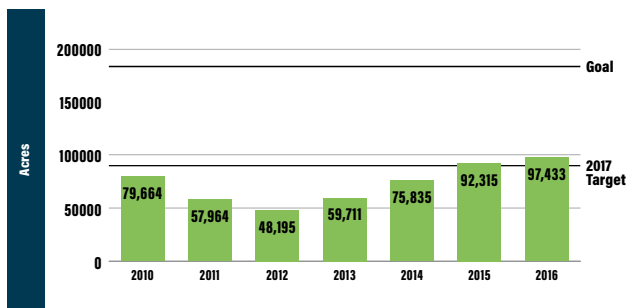
SUBMERGED AQUATIC VEGETATION (SAV)

OUTCOME

Sustain and increase the habitat benefits afforded by submerged aquatic vegetation (SAV) in the Chesapeake Bay. Achieve and sustain 185,000 acres of SAV Bay-wide, with a target of 90,000 acres by 2017 and 130,000 acres by 2025.

Fifty-three percent of outcome achieved.

THE DATA

SUBMERGED AQUATIC VEGETATION (SAV) ABUNDANCE

In 2016, an estimated 97,433 acres of underwater grasses were mapped in the Chesapeake Bay: 7,433 acres greater than the Chesapeake Bay Program's 2017 restoration target and 53 percent of the partnership's 185,000-acre goal. For the second year in a row, the 2016 total is the highest amount ever recorded by the Virginia Institute of Marine Science. Researchers attribute the rise in underwater grasses to a strong increase in the tidal freshwater and moderately salty regions of the Bay. The iconic grass beds at the mouth of the Susquehanna River, for instance, continued their four-year recovery following damage from Hurricane Irene and Tropical Storm Lee. And at over 10,000 acres, the grasses that stretch from Smith Island to Tangier Island have become the biggest contiguous grass bed in the Bay. Researchers observed a drop in the eelgrass that grows in the very salty waters of the lower Bay, where beds had increased in recent years following losses that occurred during the hot summers of 2005 and 2010.

TREE CANOPY

OUTCOME

Expand urban tree canopy by 2,400 acres by 2025 to provide air quality, water quality and habitat benefits throughout the Chesapeake Bay watershed.

DID YOU KNOW?

In August, Forestry Workgroup partners gathered 120 urban forestry and community engagement practitioners from government, nonprofits and the private sector to explore how the principles of environmental justice impact their work. The 'Trees for All' workshop covered some of the underlying factors that contribute to unequal distribution of quality canopy coverage in communities and provided opportunities for participants to map out how to overcome these barriers where they work. Attendees learned how to model their own success at home from regional and national examples of successful community-driven tree programs. Highlights from this and other initiatives throughout the watershed can be found on the Chesapeake Tree Canopy Network website.
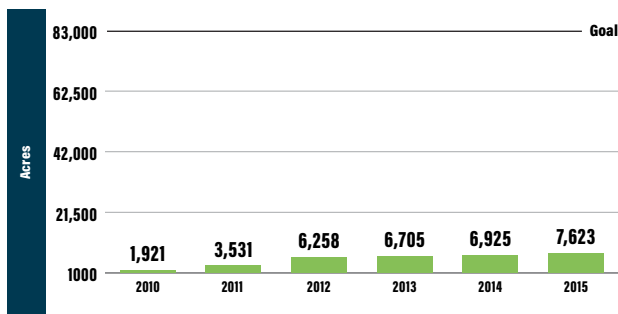
WETLANDS

OUTCOME

Increase the capacity of wetlands to provide water quality and habitat benefits throughout the Chesapeake Bay watershed. Create or reestablish 85,000 acres of tidal and non-tidal wetlands and enhance the function of an additional 150,000 acres of degraded wetlands by 2025, primarily on agricultural or natural landscapes.

Nine percent of outcome achieved.

THE DATA

WETLANDS RESTORED ON AGRICULTURAL LANDS (CUMULATIVE)

Acres						
83,000						Goal
62,500						
42,000						
21,500						
1000	1,921	3,531	6,258	6,705	6,925	7,623
	2010	2011	2012	2013	2014	2015

Between 2010 and 2015, 7,623 acres of wetlands were created or reestablished on agricultural lands. While this outcome includes a target to restore 85,000 acres of tidal and non-tidal wetlands in the watershed, 83,000 of these restored acres should take place on agricultural lands. The wetlands restored on agricultural lands between 2010 and 2015 mark a nine percent achievement of the 83,000-acre goal.
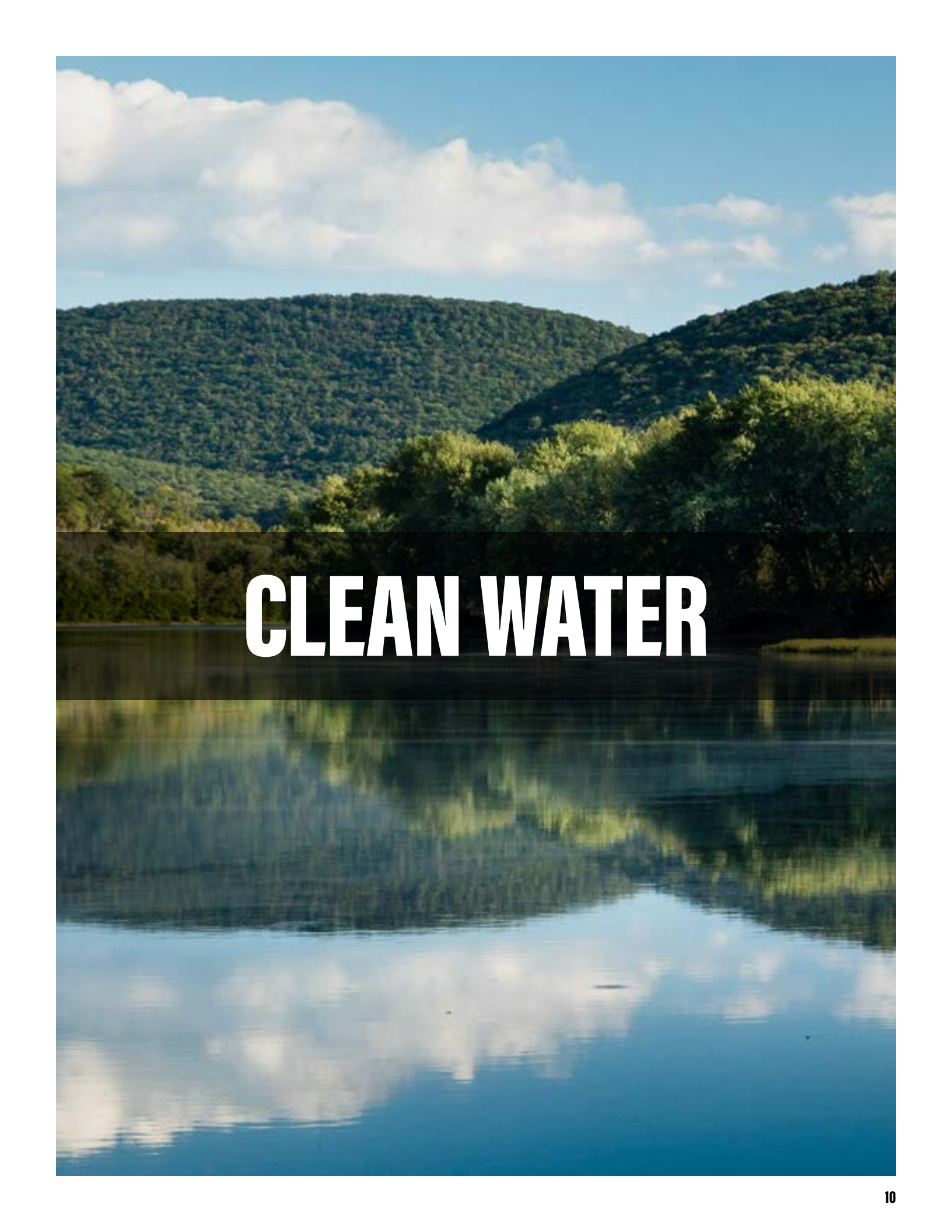
DID YOU KNOW?

While a recent survey estimated approximately one-third of the region's private landowners have expressed interest in restoring wetlands on their property, many are not aware of the restoration programs that are available to them. The Chesapeake Bay Program's Wetland Workgroup and Creative Team are developing a website to overcome this obstacle and accelerate wetland restoration on private lands. By providing a comprehensive listing of restoration programs and a tool to support landowner decision-making, this website will allow both landowners and restoration practitioners to identify the programs that are best suited to an individual's interests.

"FROM CLEANING UP AFTER OUR PETS, TO INSTALLING RAIN BARRELS OR RAIN GARDENS ON OUR PROPERTIES, TO KEEPING LITTER OUT OF STREAMS, WE ALL HAVE A ROLE TO PLAY IN MEETING OUR CLEAN WATER GOALS FOR THE ANACOSTIA AND POTOMAC RIVERS, ROCK CREEK AND THE CHESAPEAKE BAY."

- TOMMY WELLS
DIRECTOR, DISTRICT OF COLUMBIA DEPARTMENT OF ENERGY AND ENVIRONMENT

CLEAN WATER

WATER QUALITY

2017 AND 2025 WATERSHED IMPLEMENTATION PLANS (WIPS)
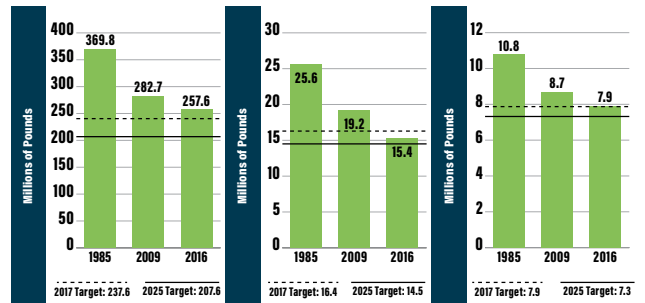
OUTCOME

By 2017, have practices and controls in place that are expected to achieve 60 percent of the nutrient and sediment load reductions necessary to achieve applicable water quality standards compared to 2009 levels. By 2025, have all practices and controls in place to achieve applicable water quality standards as articulated in the Chesapeake Bay Total Maximum Daily Load.

Practices are in place to achieve 33 percent of the nitrogen reductions, 81 percent of the phosphorus reductions and 57 percent of the sediment reductions necessary to attain water quality standards.

THE DATA

MODELED POLLUTION LOADS

	Nitrogen	Phosphorus	Sediment
1985	369.8	25.6	10.8
2009	282.7	19.2	8.7
2016	257.6	15.4	7.9
2017 Target	237.6	16.4	7.9
2025 Target	207.6	14.5	7.3

(Millions of Pounds)

Computer simulations show that pollution controls put in place in the Chesapeake Bay watershed between 2009 and 2016 lowered nitrogen loads nine percent, phosphorus loads 20 percent and sediment loads nine percent. Experts attribute the drop in estimated nitrogen loads to technological upgrades at wastewater treatment plants and agricultural best management practices (BMPs). Agricultural BMPs have also contributed to the drop in estimated phosphorus and sediment loads, but increased phosphorus and sediment pollution from urban development has offset or reduced the overall benefits these practices have engendered. Pollution-reducing practices are in place to achieve 33 percent of the nitrogen reductions, 81 percent of the phosphorus reductions and 57 percent of the sediment reductions necessary to attain applicable water quality standards as compared to 2009, the year before the U.S. Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (Bay TMDL).

WATER QUALITY STANDARDS ATTAINMENT AND MONITORING

OUTCOME

Improve our capacity to monitor and assess the effects of the management actions being taken to implement the Chesapeake Bay Total Maximum Daily Load and improve water quality. Report annual progress being made in attaining water quality standards and trends in reducing nutrients and sediment in the watershed.
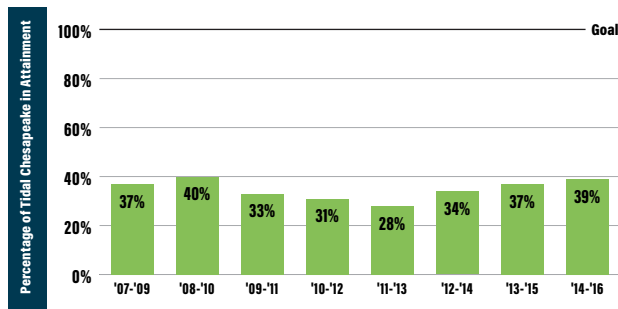
Thirty-nine percent of the Chesapeake Bay and its tidal tributaries met water quality standards between 2014 and 2016.

241 million pounds of nitrogen, 13.6 million pounds of phosphorus and 2.5 million tons of sediment reached the Bay in 2016.

THE DATA

### WATER QUALITY STANDARDS ATTAINMENT

According to preliminary data, almost 40 percent of the Chesapeake Bay and its tidal tributaries met water quality standards during the 2014 to 2016 assessment period. This marks the second highest level of water quality standards attainment since 1985, and shows aquatic conditions have improved following the damaging impacts of Hurricane Irene and Tropical Storm Lee. While the long-term trend in estimated water quality standards attainment is positive, water quality remains far below the 100 percent attainment needed for clean water and a stable aquatic habitat, and an estimated 60 percent of tidal waters are considered impaired.

NITROGEN LOADS AND RIVER FLOW
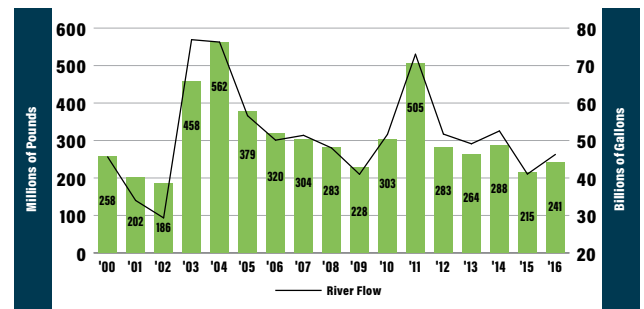
PHOSPHORUS LOADS AND RIVER FLOW
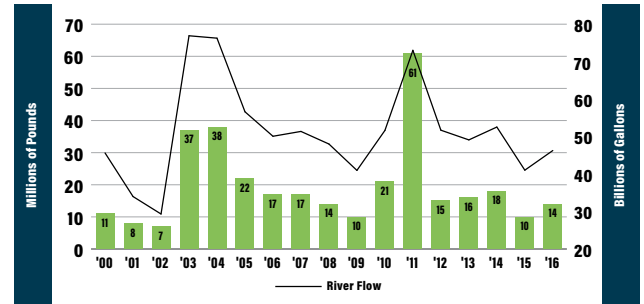
SEDIMENT LOADS AND RIVER FLOW
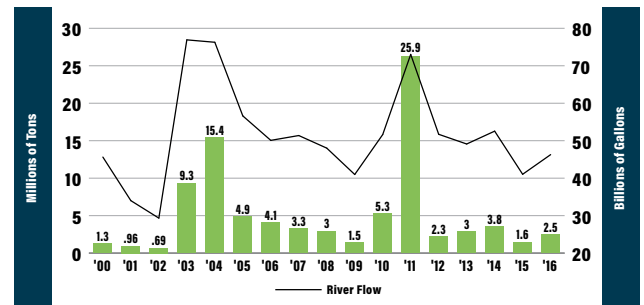
Between October 2015 and September 2016, approximately 241 million pounds of nitrogen, 13.6 million pounds of phosphorus and 2.5 million tons of sediment reached the Chesapeake Bay. While these loads were below the long-term average, they do mark a 12 percent, 35 percent and 59 percent increase from the previous year, respectively. Experts attribute this increase in large part to the fact that river flow—which is based on precipitation—also increased from the previous year, and pollution loads are heavily impacted by the amount of water flowing into the Bay. These load estimates are based primarily on monitoring data from the Bay's major rivers and wastewater treatment facilities.

TOXIC CONTAMINANTS POLICY AND PREVENTION

OUTCOME

Improve practices and controls that prevent or reduce the effects of toxic contaminants on aquatic systems and humans. Build on existing programs to reduce the amount and effects of polychlorinated biphenyls (PCBs) in the Chesapeake Bay watershed. Evaluate the implementation of additional policies, programs and practices for other contaminants that need to be further reduced or eliminated.
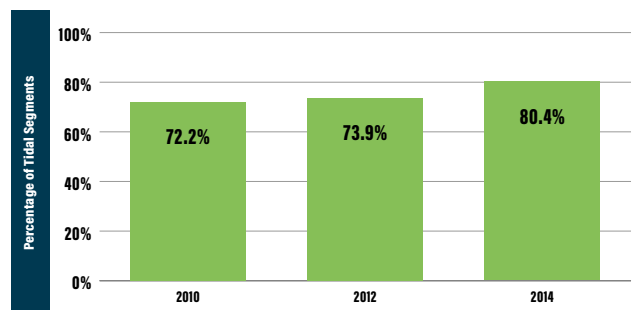
Eighty percent of the Chesapeake Bay and its tidal tributaries was partially or fully impaired by toxic contaminants in 2014.

THE DATA

TOXIC IMPAIRMENTS IN THE TIDAL CHESAPEAKE BAY

According to data submitted to the U.S. Environmental Protection Agency in 2014, 80 percent of the Chesapeake Bay's tidal waters are partially or fully impaired by toxic contaminants. This marks a continued increase in toxic contaminant impairments since 2010. While chemical contamination is often characterized as a localized problem occurring in "hot spots" or "regions of concern," metals, polychlorinated biphenyls (PCBs) and priority organics exceed water quality criteria in at least part of all of the tidal tributaries that deliver water to the main stem of the Bay. Even if inputs of toxic contaminants decline, there may be little short-term change in this indicator of environmental health, as toxics will persist in bottom sediment and fish tissue.

TOXIC CONTAMINANTS RESEARCH

OUTCOME

Increase our understanding of the impacts and mitigation options for toxic contaminants. Develop a research agenda and further characterize the occurrence, concentrations, sources and effects of mercury, PCBs and other contaminants of emerging and widespread concern. In addition, identify which best management practices might provide multiple benefits of reducing nutrient and sediment pollution as well as toxic contaminants in waterways.

DID YOU KNOW?

The U.S. Geological Survey (USGS) continues studies on the sources and effects of endocrine-disrupting compounds, including chemicals of emerging concern, and other stressors on fish, so that partners will have improved information to reduce their effects on fisheries. USGS research found 85 percent of male smallmouth bass and 27 percent of male largemouth bass tested in waters in or near 19 National Wildlife Refuges in the northeastern United States had intersex conditions (male fish having eggs that are usually only found in females).

"IT IS IMPORTANT THAT OUR DECISIONS BE BASED ON DATA TO ENSURE THE BEST EXPENDITURE OF PUBLIC FUNDS TO PROVIDE FOR THE GREATER BENEFIT OF INCREASING WATER QUALITY, AND QUALITY OF LIFE, ACROSS THE CHESAPEAKE BAY WATERSHED."

- KATE FRITZ
EXECUTIVE DIRECTOR, ALLIANCE FOR THE CHESAPEAKE BAY
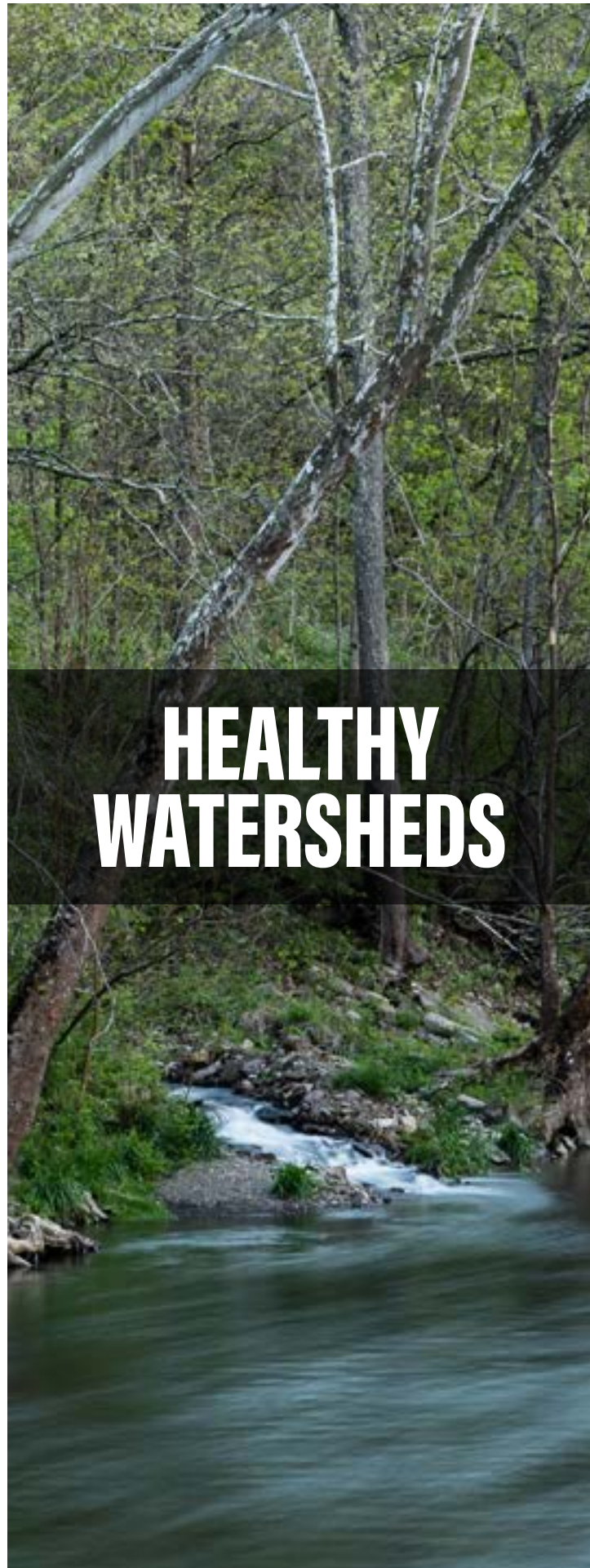
HEALTHY WATERSHEDS

OUTCOME

Ensure 100 percent of state-identified currently healthy waters and watersheds remain healthy.

HEALTHY WATERSHEDS

CONSERVED LANDS

PROTECTED LANDS

OUTCOME

By 2025, protect an additional two million acres of lands throughout the watershed—currently identified as high-conservation priorities at the federal, state or local level—including 225,000 acres of wetlands and 695,000 acres of forestland of highest value for maintaining water quality.

Fifty percent of outcome achieved.

THE DATA

PROTECTED LANDS (CUMULATIVE)

	2011 (Baseline)	2013	2015-2016
Acres	8,013,130	8,409,080	8,804,580
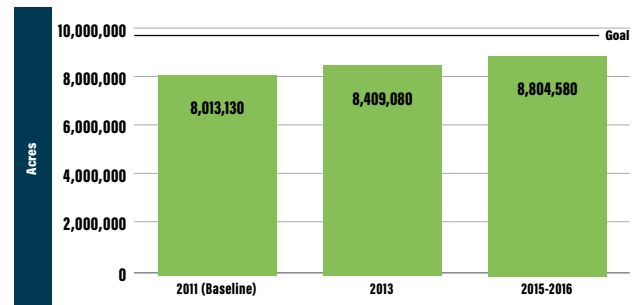
Data collected between 2015 and 2016 show that, since 2010, approximately 1,004,500 acres of land in the Chesapeake Bay watershed have been permanently protected from development. This marks an achievement of 50 percent of the goal to protect an additional two million acres, and brings the total amount of protected land in the watershed to 8 million acres. State agencies are the largest entity contributing to land protection: they hold approximately 46 percent of the protected acres in the watershed.

DID YOU KNOW?

In 2017, the Chesapeake Conservation Partnership executed an agreement with the Environmental Law Institute to have them assess and recommend revised and new mitigation policies in the states of Pennsylvania, Maryland and Virginia for linear energy projects (e.g. pipelines and power lines) that impact landscapes.

LAND CONSERVATION

LAND USE METHODS AND METRICS DEVELOPMENT

OUTCOME

By 2016, develop a watershed-wide methodology and local-level metrics for characterizing the rate of farmland, forest and wetland conversion, measuring the extent and rate of change in impervious surface coverage and quantifying the potential impacts of land conversion to water quality, healthy watersheds and communities. Share this information with local governments, elected officials and stakeholders.

DID YOU KNOW?

Using images collected through the Landsat program between 1984 and the present, Chesapeake Bay Program partners are exploring methods of assessing annual changes in forest and impervious surface coverage. Partners are also assessing options for remapping historical land use and cover in the region—including urban tree canopy—with high-resolution imagery. The results of these analyses will be publically available in 2018.

LAND USE OPTIONS EVALUATION

OUTCOME

By the end of 2017, with the direct involvement of local governments or their representatives, evaluate policy options, incentives and planning tools that could assist them in continually improving their capacity to reduce the rate of conversion of agricultural lands, forests and wetlands as well as the rate of changing landscapes from natural lands to those that are impervious. Strategies should be developed for supporting local governments' and others' efforts in reducing these rates by 2025 and beyond.

DID YOU KNOW?

Local governments play a critical role in land conservation. Local officials design and enact regulations that dictate how a region develops, and can provide property owners incentives to facilitate conservation and growth. In 2017, the National Center for Smart Growth Research and Education worked with the Chesapeake Bay Program and Chesapeake Bay Trust to publish a Conservation Land-Use Policy Toolkit that helps local governments select the best policy tool to slow the loss of farms, forests and wetlands.

ENGAGED COMMUNITIES

PUBLIC ACCESS

OUTCOME

By 2025, add 300 new public access sites to the Chesapeake Bay watershed, with a strong emphasis on providing opportunities for boating, swimming and fishing, where feasible.

Forty-four percent of outcome achieved.

THE DATA

PUBLIC ACCESS SITES (CUMULATIVE)

	Baseline	2011	2012	2013	2014	2015	2016
Sites	1,139	1,154	1,172	1,208	1,225	1,247	1,271

Goal: 1,500
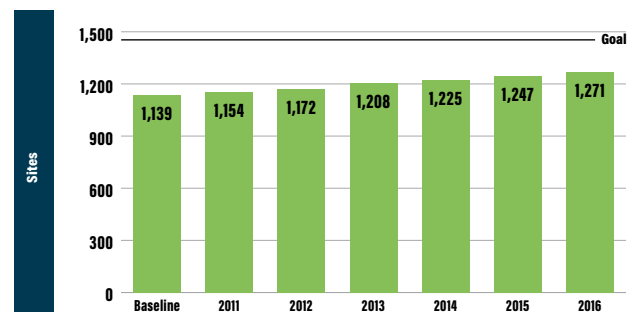
Between 2010 and 2016, 132 public access sites were opened to the public. This marks a 44 percent achievement of the goal to add 300 new access sites to the watershed, and brings the total number of access sites in the region to 1,271. There are currently seven public access sites in Delaware, 24 in the District of Columbia, 36 in New York, 46 in West Virginia, 207 in Pennsylvania, 350 in Virginia and 601 in Maryland.

PUBLIC ACCESS
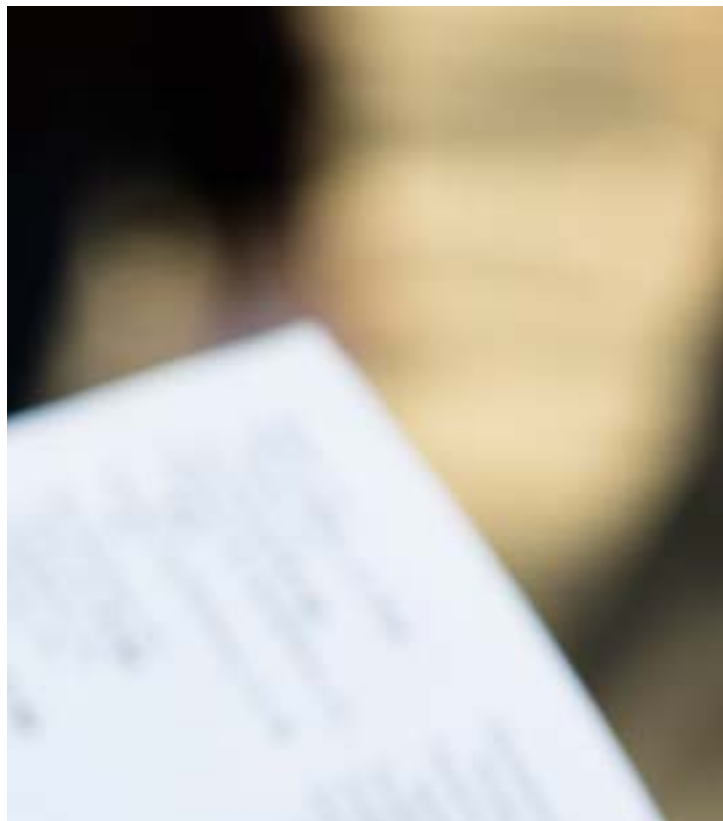
ENVIRONMENTAL LITERACY PLANNING

OUTCOME

Each participating Chesapeake Bay jurisdiction should develop a comprehensive and systemic approach to environmental literacy for all students in the region that includes policies, practices and voluntary metrics that support the environmental literacy goals and outcomes of the Watershed Agreement.

Twenty-one percent of respondents to a Chesapeake Bay Program survey self-identified as well-prepared to put a comprehensive and systemic approach to environmental literacy in place.

THE DATA

LOCAL EDUCATION AGENCIES' ENV. LITERACY PREPAREDNESS (2015)

Percentage of Local Education Agencies

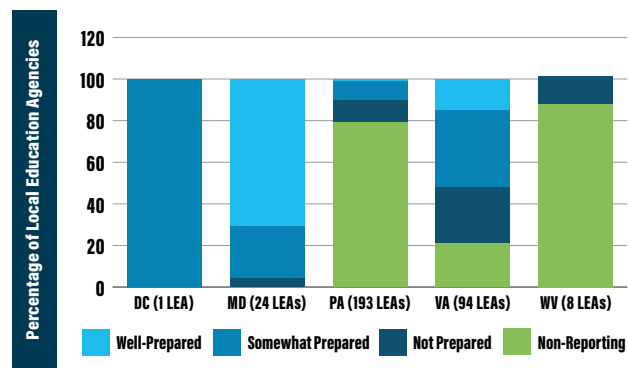Categories (x-axis): DC (1 LEA), MD (24 LEAs), PA (193 LEAs), VA (94 LEAs), WV (8 LEAs)

Legend: Well-Prepared, Somewhat Prepared, Not Prepared, Non-Reporting

In 2015, 21 percent of the 149 local education agencies that responded to a Chesapeake Bay Program survey self-identified as well-prepared to put a comprehensive and systemic approach to environmental literacy in place. About 43 percent of these local education agencies identified as somewhat prepared, and 35 percent identified as not prepared. Fifty-eight percent of the local education agencies in the watershed—or those school districts that operate public elementary, middle and high schools—did not respond to this survey. This dataset does not include information from Delaware or New York.

ENVIRONMENTAL LITERACY
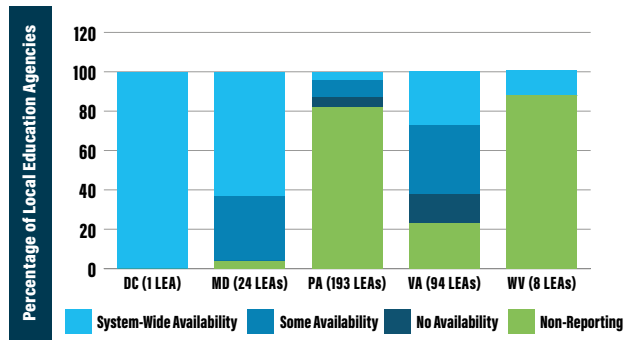
STUDENT MWEE

OUTCOME

Increase students' age-appropriate understanding of the watershed through participation in teacher-supported Meaningful Watershed Educational Experiences (MWEEs) and rigorous, inquiry-based instruction, with a target of at least one MWEE in elementary, middle and high school depending on available resources.
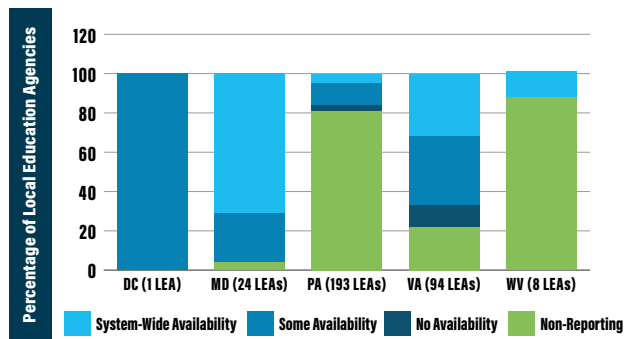
Twenty-one percent of responding local education agencies reported providing system-wide MWEEs in at least one grade level in elementary school, 35 percent reported providing system-wide MWEEs in at least one grade level in middle school and 28 percent reported providing system-wide MWEEs in at least one course in high school.

THE DATA

ELEMENTARY SCHOOL MWEE AVAILABILITY

Percentage of Local Education Agencies

DC (1 LEA) | MD (24 LEAs) | PA (193 LEAs) | VA (94 LEAs) | WV (8 LEAs)

System-Wide Availability | Some Availability | No Availability | Non-Reporting

MIDDLE SCHOOL MWEE AVAILABILITY

Percentage of Local Education Agencies

DC (1 LEA) | MD (24 LEAs) | PA (193 LEAs) | VA (94 LEAs) | WV (8 LEAs)

System-Wide Availability | Some Availability | No Availability | Non-Reporting

HIGH SCHOOL MWEE AVAILABILITY

Percentage of Local Education Agencies

DC (1 LEA) | MD (24 LEAs) | PA (193 LEAs) | VA (94 LEAs) | WV (8 LEAs)

System-Wide Availability | Some Availability | No Availability | Non-Reporting

During a Meaningful Watershed Educational Experience (MWEE), students must investigate an environmental issue, participate in an outdoor field experience, take action to address an environmental issue and analyze, evaluate and communicate their conclusions. In 2015, 37 percent of the approximately 140 local education agencies that responded to a Chesapeake Bay Program survey reported providing system-wide MWEEs in at least one grade level in elementary school. Forty-three percent reported providing system-wide MWEEs in at least one grade level in middle school, and 31 percent reported providin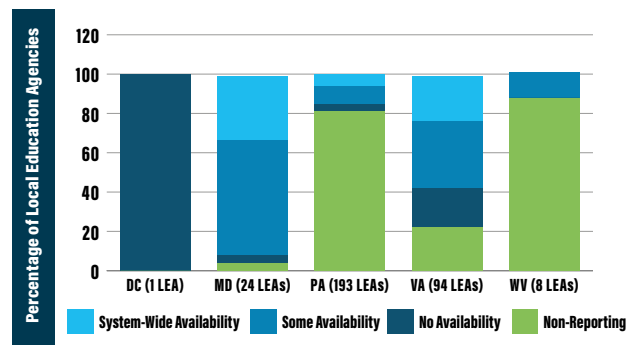g system-wide MWEEs in at least one course in high school. About 67 percent of the local education agencies in the watershed—or those school districts that operate public elementary, middle and high schools—did not respond to this survey. This dataset does not include information from Delaware or New York.

DID YOU KNOW?

In 2017, the Chesapeake Bay Program's Education Workgroup published An Educator's Guide to the Meaningful Watershed Educational Experience. This easy-to-use manual for constructing high-quality educational experiences for all students brings consistency and quality to the work done under the Environmental Literacy Planning, Student MWEE and Sustainable Schools outcomes. As jurisdictions continue to implement improved and more systemic MWEEs, they will use and promote this so-called MWEE Guide with teachers and non-formal educators and strengthen outdoor learning for students throughout the region. This resource will help create young citizens who understand and respect our natural world.
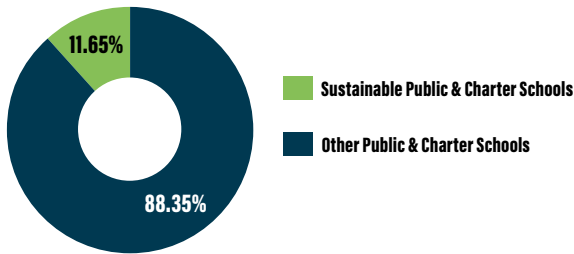
SUSTAINABLE SCHOOLS

OUTCOME

Increase the number of schools in the region that reduce the impact of their buildings and grounds on their local watershed, environment and human health through best practices, including student-led protection and restoration projects.

Twelve percent of public and charter schools in the Chesapeake Bay watershed are certified sustainable.

THE DATA

Certified Sustainable Schools (2015)

11.65%

88.35%

Sustainable Public & Charter Schools

Other Public & Charter Schools

In 2015, 12 percent of public and charter schools in the Chesapeake Bay watershed—a total of 502 schools—were certified sustainable by the U.S. Green Ribbon Schools, National Wildlife Federation Eco-Schools USA, Maryland Green Schools and Virginia Naturally Schools programs. At 82 percent of the total (or 410 schools), Maryland is home to most of the certified sustainable schools in the watershed. Seventeen percent of the sustainable schools in the watershed are located in Virginia, with additional schools in Pennsylvania and Washington, D.C.

"MANY OF OUR DAILY ACTIVITIES HAVE THE POTENTIAL TO DIRECTLY IMPACT OUR LOCAL WATER QUALITY, SO WE ALL CAN PLAY A ROLE IN PROTECTING AND IMPROVING OUR WATERWAYS AND THE CHESAPEAKE BAY."

- LAUREN IMGRUND
DEPUTY SECRETARY FOR CONSERVATION AND TECHNICAL SERVICES, PENNSYLVANIA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, AND ACTING INTERIM CHAIR, FOSTERING CHESAPEAKE STEWARDSHIP GOAL IMPLEMENTATION TEAM
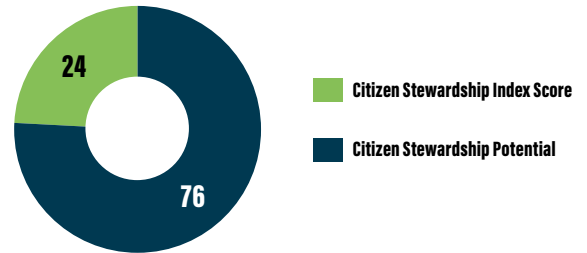
STEWARDSHIP

CITIZEN STEWARDSHIP

OUTCOME

Increase the number and diversity of trained and mobilized citizen volunteers who have the knowledge and skills needed to enhance the health of their local watersheds.

Residents of the region scored a 24 out of 100 on the Citizen Stewardship Index.

THE DATA

Citizen Stewardship (2017)

24

76

■ Citizen Stewardship Index Score

■ Citizen Stewardship Potential

In 2017, residents of the Chesapeake Bay region scored a 24 out of 100 on the first-ever Citizen Stewardship Index. There are three components to this baseline score. The Personal Action score—which is currently 38—measures the adoption of 19 actions that individuals can take to improve water quality and environmental health. The Volunteering score—which is currently 23—measures the portion of the public participating in community efforts to improve water quality and environmental health. And the Advocating score—which is currently 19—measures the portion of the public engaging in local and regional activities on behalf of water quality and environmental health. To score a 100 on the Citizen Stewardship Index, everyone in the region would need to do everything they could in their daily lives to improve water quality and environmental health.
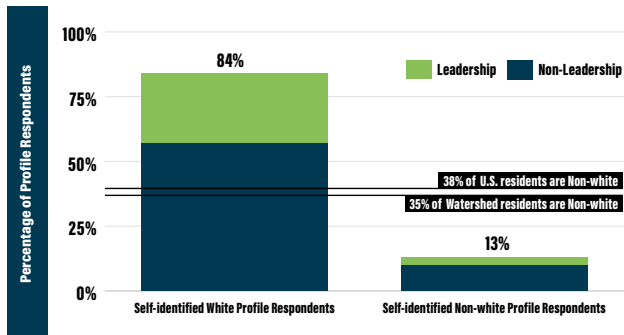
DIVERSITY

OUTCOME

Identify minority stakeholder groups not currently represented in the leadership, decision-making or implementation of current conservation and restoration activities. Create meaningful opportunities and programs to recruit and engage these groups in the Chesapeake Bay Program's work.

About 13 percent of respondents to a Chesapeake Bay Program diversity profile self-identified as non-white.

THE DATA

CHESAPEAKE BAY PROGRAM DIVERSITY PROFILE (2016)

Percentage of Profile Respondents

100% | 75% | 50% | 25% | 0%

84%

Leadership Non-Leadership

38% of U.S. residents are Non-white
35% of Watershed residents are Non-white

13%

Self-identified White Profile Respondents   Self-identified Non-white Profile Respondents

While age, gender, sexual orientation, religious faith, income level and other characteristics are important aspects of diversity, the Chesapeake Bay Program has chosen to focus first on expanding ethnic diversity among the partnership. In 2016, 13 percent of respondents to a Chesapeake Bay Program diversity profile self-identified as non-white. According to the U.S. Census Bureau, this is smaller than the portion of watershed residents who identify as non-white (about 35 percent). Of these respondents, about one-quarter identified themselves as a member of Chesapeake Bay Program leadership.

DID YOU KNOW?

In 2016, the Chesapeake Bay Program completed its first diversity profile assessment, which led many officials within the partnership to create and staff positions dedicated to diversity, equity and inclusion. New perspectives have expanded the Diversity Workgroup's efforts beyond traditional partnership events and into community groups and networks. In 2017, the Diversity Workgroup participated in career fairs at multiple universities and other venues, attended environmental justice listening sessions in Pennsylvania and helped organize the Trees for All: Environmental Justice Tree Canopy workshop in Laurel, Maryland.

LOCAL LEADERSHIP

OUTCOME

Continually increase the knowledge and capacity of local officials on issues related to water resources and in the implementation of economic and policy incentives that will support local conservation actions.

DID YOU KNOW?

Strategic Outreach Education Program for Local Elected Officials in the Chesapeake Bay Watershed, a report commissioned by the Chesapeake Bay Program's Local Leadership Workgroup and released in July 2017, provides recommendations for the design of a strategic outreach and education program for elected officials to meet the local leadership outcome in the Chesapeake Bay Watershed Agreement. The report makes recommendations in five key areas: content that needs to be conveyed to local elected officials to increase their knowledge and capacity for water resource protection and restoration; informational programs and delivery mechanisms – what exists and where gaps lie; the best way to coordinate and focus delivery mechanisms to tailor to needs of local elected officials; program cost and recommended funding sources; and how to measure progress.

CLIMATE CHANGE

CLIMATE ADAPTATION & CLIMATE MONITORING AND ASSESSMENT

OUTCOMES

CLIMATE ADAPTATION

Pursue, design and construct restoration and protection projects to enhance the resiliency of the Chesapeake Bay and its aquatic ecosystems against the impacts of coastal erosion, coastal flooding, more intense and more frequent storms, and sea level rise.

CLIMATE MONITORING AND ASSESSMENT

Monitor and assess the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs and projects.

DID YOU KNOW?

The Chesapeake Bay Program's Climate Resiliency Work-group is developing a suite of climate-related indicators that can be used to track and analyze trends, impacts and progress toward advancing climate resiliency. The suite will include measurements of physical and chemical environmental attributes; measurements of ecological, economic and societal impacts; and measurements of programmatic progress toward resilience and adaptation over time. The Climate Resiliency Workgroup is currently reviewing and prioritizing proposed indicators and will release an initial subset of indicators along with an implementation plan for the full suite by July 2018.

CLIMATE RESILIENCY

FROM THE DIRECTOR
CONTINUED IMPROVEMENTS

In reflecting over the past six years as director of the Chesapeake Bay Program, I am heartened by the progress we are making due to the hard work of this partnership to restore the Chesapeake Bay watershed. We are seeing continued improvements in many of the indicators we use to measure the health and restoration of the Bay and its tributaries. Most notable among these accomplishments are underwater or bay grasses. Bay grasses are a particularly important indicator of our progress because they need clear water to grow and thrive. This demonstrates our progress in improving water quality. Bay grasses are also an important habitat for fish and crabs, providing a safe harbor from predators, and promoting sustainable populations.

In 2011, following Hurricane Irene and Tropical storm Lee, we anticipated that underwater grass beds would be significantly damaged from high velocity storm flows and sediment, especially the Susquehanna Flats grass beds at the head of the Bay. While those beds were damaged, it was not nearly as significant as we feared. In the following years, the Susquehanna Flats and other grass beds throughout the watershed repaired themselves and expanded, showing us that our restoration efforts are rebuilding resilience back into this ecosystem. In addition to expanding acreage, we also are observing a significant increase in the diversity of underwater grass species, as well as the density of grass beds.

The progress we are seeing with underwater grasses is associated with improvements in other indicators as well. Water clarity continues to improve in certain areas of the Bay; dissolved oxygen levels are increasing and dead zones are shrinking in size, duration, frequency and severity. Almost 40 percent of our tidal waters are now meeting water quality standards. At 254 million adult female blue crabs, we are well above the 70 million threshold and the 215 million sustainability target, marking the highest amount ever recorded by the Bay-wide Blue Crab Winter Dredge Survey. And rockfish populations are considered to be recovered throughout the Bay, with this year's index in Maryland rising above the 64-year average.

The continued improvement in these indicators is clear evidence that the efforts of local, state and federal governments, the agricultural community, environmental advocacy groups and individual citizens are working. I am proud to have helped play a role in rebuilding and restoring this complex and important ecosystem. Our task now is to stay on track and finish the job.

Nick DiPasquale

Nick DiPasquale
Director, Chesapeake Bay Program

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