

State of the Chesapeake Bay Program

*Report to the Chesapeake Bay
Program Executive Council*

August 2018





The first *Chesapeake Bay Agreement* was signed on Dec. 9, 1983 by the governors of Maryland, Pennsylvania and Virginia; mayor of the District of Columbia; chair of the Chesapeake Bay Commission and administrator of the Environmental Protection Agency.

Introduction

For 35 years, the Chesapeake Bay Program has led and directed the restoration and protection of the Chesapeake Bay. A unique and regional partnership, the Chesapeake Bay Program brings together leaders and experts from a wide range of federal, state and local government agencies, including non-governmental organizations and academic institutions. The Chesapeake Bay Program is guided by the 2014 [Chesapeake Bay Watershed Agreement](#), a plan for collaboration across political boundaries, and whose signatories include the seven watershed jurisdictions of Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia and West Virginia, as well as the Chesapeake Bay Commission and the Environmental Protection Agency on behalf of federal agencies.

The *Watershed Agreement* established ten goals to advance the restoration and protection of the Chesapeake Bay watershed. Each goal is linked to a set of outcomes, or time-bound and measurable targets, which will directly contribute to its achievement. Signatories promised to openly and publicly engage watershed citizens in implementing these goals and outcomes. Partners work through Goal Implementation Teams (GITs), Workgroups and Advisory Committees to collaborate, share information and set goals. Following the adoption of the *Watershed Agreement*, the partners crafted [Management Strategies](#), and subsequently, work plans for the outcomes included within.

This report celebrates our successes by providing an overview of the progress toward our outcomes, as demonstrated by some of our indicators. It also acknowledges the challenges we currently are facing and looks to the future as we continue down the road to 2025 and beyond.



A recent study published in the Proceedings of the National Academy of Sciences analyzed the positive impact of nutrient reductions from the Chesapeake Bay Total Maximum Daily Load. It found that on-land nutrient reductions along with conservation initiatives have resulted in a rebounding underwater grass population—the biggest resurgence of grasses ever recorded, not only in the Chesapeake Bay, but in the world.

Celebrating Successes

The Chesapeake Bay Program has now passed the halfway point of the Chesapeake Bay Total Maximum Daily Load (Bay TMDL) and remains at a critical tipping point. Our indicators are showing that the watershed is resilient, vibrant and healthy in many ways, but out of balance in others.

The Chesapeake Bay Program uses a suite of environmental health, restoration and stewardship indicators to track progress toward the *Watershed Agreement*. These indicators support the partnership's adaptive management-based decision-making process and highlight the critical work that is furthering the commitments we have made.

An update of the progress the Chesapeake Bay Program is making toward meeting the goals and outcomes of the *Watershed Agreement* is published annually in the [Bay Barometer](#), our review of environmental health and restoration. Additionally, our indicators are published on [ChesapeakeProgress](#), which supports federal, public and internal oversight of our work. Some of these indicators track the factors that influence our ability to achieve our goals. Others track whether we are putting our management approaches and actions in place. Still others track whether we are achieving the goals and outcomes that will support our vision of a sustainable watershed. It is important to note that we are making progress toward all of our outcomes—even those currently without a performance indicator.



Between 2017 and 2018, the number of adult females fell 42 percent. However, the number of young crabs rose 34 percent. The young crabs counted are expected to reach maturity later this summer, which could provide a boost to commercial and recreational crabbing.

This is Progress

This is a snapshot of indicators of the *Watershed Agreement*. Please refer to the Bay Barometer for a complete update on our progress toward all 31 outcomes.

Blue crabs: Between 2017 and 2018, the abundance of adult female blue crabs in the Chesapeake Bay fell 42 percent, from 254 million to 147 million. This number is below the 215 million target but above the 70 million threshold. According to the Chesapeake Bay Stock Assessment Committee, an estimated 21 percent of the female blue crab population was harvested in 2017. For the tenth consecutive year, this number is below the 25.5 percent target and the 24 percent overfishing threshold. The stock is not depleted and is not being overfished.

Fish Passage: Between 2012 and 2017, Maryland, Pennsylvania and Virginia have opened 1,236 miles of streams to the movement of migratory fish, surpassing our 1,000-mile restoration goal.

Oysters: Eight out of 10 Chesapeake Bay tributaries have been selected for oyster reef restoration: Harris Creek, the Little Choptank River and the Tred Avon River in Maryland, and the Great Wicomico, Lafayette, Lower York, Lynnhaven and Piankatank rivers in Virginia. In seven of these tributaries, 1,008 acres of reefs have been restored. Each tributary 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.

Diversity: In the *Watershed Agreement*, the Chesapeake Bay Program adopted for the very first time a goal to increase the number and diversity of people who support and carry out conservation and restoration work. In 2016, the Alliance for the Chesapeake Bay distributed a diversity profile on behalf of the Chesapeake Bay Program to people who work for or with the partnership. Almost 84 percent of survey respondents self-identified as white or Caucasian, while 13 percent identified as non-white or non-Caucasian. Of those who identified as white, 32 percent identified themselves as a member of Chesapeake Bay Program leadership. Of those who identified as non-white, 24 percent identified themselves as a member of leadership. This latter group—people of color in positions of leadership—accounts for about three percent of total profile respondents. In 2018, the Chesapeake Bay Program committed to increasing the number of people of color in the partnership to 25 percent by 2025, and to increasing the number of people of color in leadership positions to 15 percent.

Environmental Literacy: In 2017, 23 percent of surveyed school districts identified as well-prepared to put environmental literacy programming in place. About half of these school districts are located in Virginia, and the other half in Maryland.

Public Access: Between 2010 and 2017, 153 boat ramps, fishing piers and other sites that provide direct access to the water were opening on and around the Chesapeake Bay. This brings the total number of public access sites in the region to 1,292.

Stewardship: In 2017, watershed residents scored a 24 out of 100 on the Citizen Stewardship Index: the region’s first comprehensive survey of stewardship actions and attitudes. There are three components to this score: Personal Action, Volunteering and Advocating. Personal Action (which in 2017 measured 38 out of 100) measures the adoption of 19 actions individuals can take to improve water quality and environmental health. Volunteering (which measured 23 out of 100) measures the portion of the public participating in community efforts to improve water quality and environmental health. Advocating (which measured 19 out of 100) measures the portion of the public engaging in local and regional activities on behalf of water quality and environmental health.

Student Meaningful Watershed Educational Experiences (MWEEs): In 2017, at least one-third of the Chesapeake Bay watershed’s public-school students were enrolled in a district providing system-wide MWEEs. Seventy-two percent of surveyed school districts reported providing MWEEs to at least some of their elementary school students; 77 percent reported providing MWEEs to at least some of their middle school students; and 82 percent reported providing MWEEs to at least some of their high school students.

Sustainable Schools: At least 14 percent of public and charter school in the Chesapeake Bay watershed were certified sustainable as of 2017. Certified sustainable schools include public and charter schools with the watershed that have been recognized as sustainable by the following programs: U.S. Green Ribbon Schools, National Wildlife Federation Eco-Schools USA, Maryland Green Schools, Pennsylvania Pathways to Green Schools and Virginia Naturally Schools.



Students from Benjamin Franklin High School plant native perennials to benefit pollinators at Masonville Cove Environmental Education Center in Baltimore, Md. Students planted milkweed and other pollinator-friendly plants in a garden at the center under a program led by the National Aquarium and funded through a grant from the National Fish and Wildlife Foundation.

Pollution Trends: Practices are in place to achieve 87 percent of the phosphorus reductions, 67 percent of the sediment reductions and 40 percent of the nitrogen reductions needed to reach clean water standards as compared to 2009, the year prior to the establishment of the Bay TMDL.

Underwater Grasses: In 2017, underwater grass abundance reached 57 percent of our ultimate restoration goal and highest amount ever recorded—104,843 acres—by the annual aerial survey. This is 14,483 acres greater than the 2017 restoration target.

Water Quality: During the 2014 to 2016 assessment period, 40 percent of the Bay and its tidal tributaries met water quality standards: the highest estimate of water quality standards attainment since 1985.

The data and information that support our indicators are drawn from a range of trusted sources, including government agencies, academic institutions, nongovernmental organizations and direct demographic and behavior surveys. In some cases, this data and information dates back three decades, and in others, data collection began shortly before the *Watershed Agreement* was signed.

How We Work

Using indicators to take a high-level look at our progress is a critical piece of the Biennial Strategy Review System. Implemented in 2017, the Chesapeake Bay Program's Biennial Strategy Review System (SRS) is a two-year adaptive management process as called for in the Watershed Agreement. It is based on the Adaptive Management Decision Framework as approved by the Principal's Staff Committee and is designed to improve our effectiveness in achieving the goals and outcomes of the *Watershed Agreement*. The SRS began with a two-day Biennial Review meeting in February 2017 designed to provide a broad review of where and why we have made progress, and identify issues and developments in the scientific, fiscal and policy fields that could impact goal and outcome achievement.

Since May of 2017, the Management Board has held five of the seven quarterly progress meetings in an SRS cycle. During these meetings, the partnership reviews progress toward individual outcomes, identifies lessons learned, applies new opportunities and understandings, and implements needed changes to management approaches and/or actions. Following these quarterly progress meetings, workgroups and teams draft changes to work plans and Management Strategies based on thoughtful analysis and Management Board input.

As of July 12, 2018, almost half of the outcomes in the *Watershed Agreement* have updated their work plans and are working towards revising their Management Strategies to reflect new direction and understanding. Most groups noted their reliance on the continued collection and analysis of data used to make decisions within their group and within the broader partnership. Coordination and increased understanding between existing partners, and the broadening of the partnership as a whole, will be critical to future success for many outcomes. The remaining quarterly progress meetings will take place in August and November 2018 to complete the first cycle, and by the next meeting of the Executive Council will include a fuller review of this first cycle. The next two-year cycle will begin in May 2019. The partnership created an SRS Planning Team under the Enhancing Leadership, Partnership and Management Goal Implementation Team to facilitate the implementation of the SRS and assist workgroups throughout the process.



The Chesapeake Bay Program Management Board makes a field trip to St. Luke's Church in Annapolis, Md., to tour a recent stream restoration and living shoreline on the property.



The Susquehanna River flows south past Conowingo Dam, toward Havre de Grace, Md., on June 27, 2016. Conowingo Dam has long trapped sediment runoff originating from farms and other sources upstream. But its capacity is reaching equilibrium, meaning it is trapping less sediment and sending more of it to the Bay.

Acknowledging Challenges

Despite these encouraging signs of resiliency, challenges remain for the restoration of the Chesapeake Bay, including knowledge and support among lawmakers, landowners, local government officials and members of the public; the alignment of goals, priorities and resources among Chesapeake Bay Program partners; and the availability of funding.

The Bay TMDL, established by the Environmental Protection Agency (EPA) in 2010, called for an assessment in 2017 to review the progress that the seven watershed jurisdictions have made to reduce the amount of nutrients and sediment flowing into the Chesapeake Bay and local rivers and streams. The midpoint assessment looked at the jurisdictions final [2016-2017 milestones](#) and [2017 progress data](#) to determine if practices were in place to achieve 60 percent of the necessary pollution reductions. While the partnership exceeded its halfway goal for reducing phosphorus and sediment, it fell short for nitrogen. Practices are currently in place to achieve 40 percent of the nitrogen reductions, 87 percent of the phosphorus reductions, 67 percent of the sediment and 40 percent of nitrogen reductions necessary to attain water quality standards.

The midpoint assessment was a chance for the EPA and the Chesapeake Bay Program to step back and assess how the Bay TMDL and Watershed Implementation Plans (WIPs) are making a difference in Bay restoration, if they are working as intended and if there is a better way to implement priorities and achieve local water quality as well as Bay restoration goals.

With the midpoint assessment and two-year milestone evaluations, many of the challenges identified by the Chesapeake Bay Program for this year center around water quality. After the first full SRS cycle concludes at the end of this year, next year's will focus on implementation of the other goals and outcomes of the *Watershed Agreement*.

The midpoint assessment identified two areas in which the implementation of conservation practices will need to accelerate in order to have 100 percent of pollution-reducing practices in place by 2025.

Agriculture: The U.S. Department of Agriculture Natural Resources Conservation Service estimates that there are more than 83,000 farms throughout the Chesapeake Bay watershed, comprising more than 30 percent of the region. Unfortunately, some agricultural practices can push pollution into the Bay and its waterways.

Urban/Suburban: Precipitation in an urban or suburban area that does not evaporate or soak into the ground but instead runs across the land and into the nearest waterway is considered stormwater runoff. Increased development across the watershed has made stormwater runoff the fastest growing source of pollution to the Chesapeake Bay. It can erode stream banks, lead to flooding and push excess nutrients, sediment and chemical contaminants into waterways.

Challenges to Bay restoration aren't just limited to pollution from source sectors. Development, population growth, man-made structures such as the Conowingo Dam and the increasing threat of climate change all play a different role in their impact of the Chesapeake Bay.

Conowingo Dam: Located on the lower Susquehanna River in Maryland, the Conowingo Dam has long captured sediment flowing downstream, but because the reservoir behind the dam is essentially full, it is now only trapping sediment in the short term. During large storms and severe floods, the fast-moving water flow scoops up the sediment and attached nutrients stored within the reservoir and carries it over the dam and into the Chesapeake Bay.

Climate change: Over the past century, the waters of the Chesapeake Bay have risen about one foot and the temperature has increased about 1.2 degrees Fahrenheit. Increased rainfall and higher stream and air temperatures can impact plants, animals, human health and the economy. Adapting to these changes will mean adjusting our policies as well as our protection and restoration efforts.

Population growth: Thanks to a strong economy, diverse communities and rich natural and historic resources, more than 18 million people currently reside in the Chesapeake Bay watershed. However, each one of these people consume natural resources, pollute the land, water and air, and alter the landscape to best fit our needs. Since 1950, the human population of the watershed has more than doubled, and experts believe the number will reach 20 million by 2030.



A child plays in nuisance flooding—associated with tides instead of weather—near the Chrysler Museum of Art in Norfolk, Va., after a heavy rainfall on July 29, 2017. Climate change and land subsidence have combined to make Norfolk second only to New Orleans in terms of population size threatened by sea level rise.



Darius Stanton of the Chesapeake Bay Program teaches a young girl about the human impact on the Chesapeake Bay watershed using a bead activity at the Festival del Río Anacostia in Bladensburg, Md., on October 14, 2017.

Moving Forward

Our partners are working hard to develop collaborative and innovative solutions for addressing the trapping capacity of the Conowingo Dam, accounting for the increasing watershed population and the threats of climate change. For example, Chesapeake Bay Program jurisdictions are also in the process of developing and will implement a separate WIP for Conowingo Dam with oversight by EPA. But other entities are deeply involved as well—from watershed organizations to local governments, people are engaged in what they can do to help combat the flow of nutrients and sediments into their local waterways.

The jurisdictions develop WIPs to help them determine how they will meet their pollution reduction goals. Phase I WIPs were developed in 2010 and Phase II in 2012. The results of the midpoint assessment will help inform the next iteration of WIPs, Phase III, which will guide the jurisdictions and their local partners and stakeholders on what actions and controls they will need to take and put in place to meet their pollution reduction goals by 2025.

These updated plans, along with the most current science and data, and the actions taken by watershed residents, will all play a role in how the next chapter of Bay restoration is written.

New modeling tools: The Chesapeake Bay Program has developed a brand-new suite of modeling tools for jurisdictions and local partners to use in drafting and implementing their Phase III WIPs and two-year milestones through 2025. The new suite has a more simplified structure than the previous version and includes improved nutrient data, cutting edge high-resolution land cover data and new and improved information about the efficiencies of pollution reducing conservation practices.

Co-benefits: The Chesapeake Bay Program continues to foster a culture of collaboration and advocates for work that crosses organizational boundaries. Teams within the Bay Program continue to explore the opportunity to maximize the [co-benefits](#) of restoration and conservation

work and to quantify ecosystem services. Jurisdictions are encouraged to build co-benefits into their Phase III WIPs to help meet their pollution reduction targets, improve the local waterways in their communities and meet additional restoration goals under the *Watershed Agreement*.

Next-generation stewards: The well-being of the watershed will soon rest in the hands of its youngest citizens. Strong, targeted environmental education programs can give students the skills they need to protect and restore their local watersheds. The Education Workgroup will continue to direct and support the systemic implementation of environmental literacy throughout the watershed, as well as advocate for encouraged collaboration between State Superintendents of Education and conservation and environmental agencies.

Promoting a culture of diversity and environmental stewards: The Chesapeake Bay Program will continue efforts to increase people of color both in the Bay Program and among its leadership. After adopting for the very first time a goal to increase diversity, the Bay Program now strives to meet a higher goal to be more reflective of the watershed it represents. The Chesapeake Bay Program will also continue to promote stewardship actions to empower residents to help enhance the health of their local watersheds.

Local action: Local governments play a critical role in the work of restoring and protecting the Chesapeake Bay watershed. Work continues to ensure local governments and local elected officials are engaged, informed and knowledgeable with watershed issues and the capacity to implement restoration and protection initiatives. Work is underway to develop a methodology for measuring our work to increase the knowledge and capacity of local officials on issues related to water resources and the implementation of incentives that will support local conservation.

The Chesapeake Bay Program celebrates the vibrancy and resiliency of the Chesapeake Bay watershed but continues to be mindful and address the challenges of the ecosystem. Efforts to engage localities, residents and students will help ensure a sustainable future for the Chesapeake Bay region. Through efforts like the Biennial Strategy Review System and the Phase III WIPs, jurisdictions and the Bay Program will continue to build a collaborative culture to protect this national treasure.



The 2017 Citizen Stewardship Index was the first comprehensive survey of stewardship actions and attitudes in the Chesapeake Bay watershed. It found that 70 percent of watershed residents want to do more to help make their local creeks, rivers and lakes healthier and that 86 percent of watershed residents believe if people work together, water pollution can be fixed.



Ashley Shepard, left, supplies fourth grade students from Granby Elementary School in Norfolk, Va., with grabbers and plastic bottle "fish" to grab after learning how herons hunt for prey on the Learning Barge docked at Grandy Village Learning Center in Norfolk on Oct. 23, 2015. Learning stations on the barge featured science lessons on topics such as water quality and wildlife.