



(Photo by Will Parson/Chesapeake Bay Program)

I. Introduction

The Chesapeake Bay Program partners first recognized and set goals related to urban tree canopy in the 2003 Chesapeake Executive Council Directive (03-01) on Expanded Riparian Forest Buffer Goals. At the time, partners committed to working with five local jurisdictions in each state to complete an assessment of urban forests, adopt a local goal to increase urban tree canopy cover and encourage measures to attain the established goals.

Since then, through the combined efforts of local, state and federal resources, there has been a steady progression in the use of high-resolution urban tree canopy assessments to set canopy goals and inform tree planting efforts in communities. These efforts were aided by a 2006 workshop and resulting guidance document, [Urban Tree Canopy Goal Setting: A Guide for Chesapeake Bay Communities](#). Figure 1 shows a map of the over 70 communities and nine counties that had conducted assessments in the Bay watershed as of 2011, and more have been completed since then.

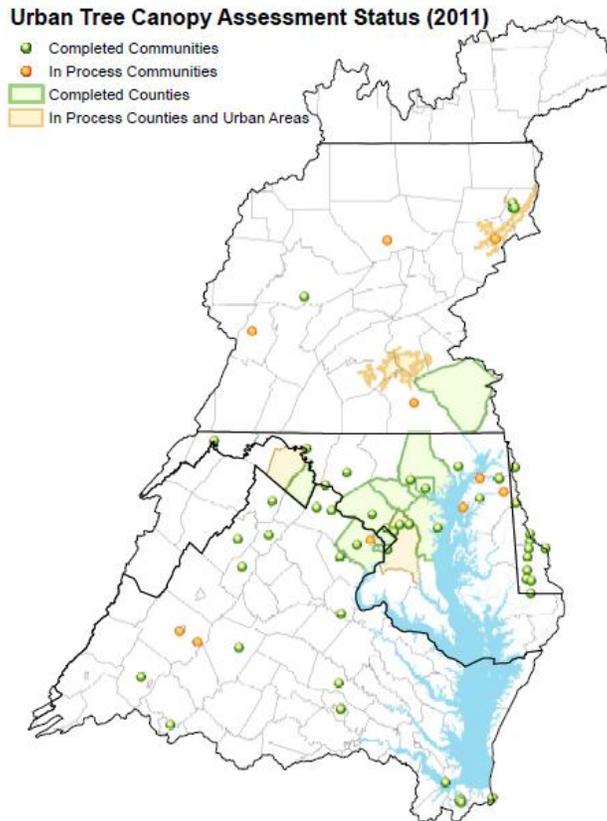


Figure 1. Urban Tree Canopy Assessments in Bay watershed (2011)

Despite these achievements, relatively little information exists on the progress communities have made in increasing tree canopy through planting, protection and maintenance efforts. The 2014 *Chesapeake Bay Watershed Agreement* builds on past progress by setting a quantitative outcome for increasing urban and community tree canopy and tasking Chesapeake Bay Program partners with creating a management strategy and two-year workplans to assist communities with achieving their goals.

II. Goal, Outcome and Baseline

This Management Strategy identifies approaches for achieving the following goal and outcome:



Vital Habitats Goal

Restore, enhance and protect a network of land and water habitats to support fish and wildlife, and to afford other public benefits, including water quality, recreational uses and scenic value across the watershed.

Tree Canopy Outcome

Continually increase urban tree canopy capacity to provide air quality, water quality and habitat benefits throughout the watershed. Expand urban tree canopy **by 2,400 acres by 2025.**

This Management Strategy uses a broad definition of “urban” tree canopy that includes all sizes of communities. It is important to note that this goal is intended to reflect a *net gain* in acreage of tree canopy, after accounting for canopy losses due to various factors such as development, storms, pests/diseases and natural mortality. Meeting the goal requires protecting as much of our existing tree canopy as possible and planting enough to both mitigate losses and expand the tree canopy cover by 2,400 acres.

The goal of 2,400 acres was set in 2013 by each state forestry agency estimating what they thought could be accomplished on an annual and long-term basis over the next 12 years (2013-2025) (Table 1). However, this estimation was constrained by the fact that most of the states have not had access to good data on the tree plantings carried out by varied organizations throughout the state and trends in tree canopy gains and losses. Also, the targets were set based on an earlier BMP definition of 100 trees planted equals one acre of new canopy, which has since been updated to 300 trees planted equals one acre. This means three times as many trees would have to be planted to achieve the same targets. Through recent partner engagement to develop their Phase III Watershed Implementation Plan, Pennsylvania set a revised target of 50 acres by 2025 which reflects a more realistic estimate based on existing capacity and resources. During the 2019-2020 period, states will have the opportunity to revisit and revise targets if needed based on the latest data and state-specific strategies, and we will assess whether a change to the outcome might be recommended once we have updated watershed-wide tree canopy data to better gauge progress.

Table 1. State Targets set in 2013 to meet Tree Canopy Outcome*

| State | Annual Target (New Acres) | 2025 Target (New Acres) |
|---------------|---------------------------|-------------------------|
| Delaware | 5 | 60 |
| DC | 40 | 480 |
| Maryland | 45 | 540 |
| New York | 5 | 60 |
| Pennsylvania | 60 | 720 |
| Virginia | 40 | 480 |
| West Virginia | 10 | 120 |
| TOTAL | 205 | 2460 |

**In 2019, Pennsylvania revised their target to 50 acres by 2025 to align with the Phase III Watershed Implementation Plan target developed with stakeholder input*

Although the outcome focuses on the quantity of tree canopy – both existing trees protected and newly planted trees – it is just as important to address the quality or health of the urban forest in order for its benefits to be sustained over time. Therefore, this Management Strategy recommends a holistic approach to managing the urban tree canopy, incorporating planning, protection and maintenance actions needed to sustain a healthy urban forest.

One component of the urban tree canopy that provides unique water quality benefits is urban riparian forest buffers along waterways. The [Forest Buffer Management Strategy](#) addresses riparian buffer goals and actions throughout the watershed, with an emphasis on agricultural lands. Because riparian buffers are such a valuable practice in urban and suburban areas as well, they are included in the suite of information, tools and technical assistance developed to support the Tree Canopy outcome.

Baseline and Current Condition

One area of progress since the first Tree Canopy Management Strategy was released has been the development of a watershed-wide tree canopy dataset, as part of the Chesapeake Bay Program partnership's investment in high resolution land cover data. Table 2 shows the Baseline for the Tree Canopy outcome, based on the 2013 land cover data.

Table 2. Tree Canopy Outcome Baseline (acres within Chesapeake Bay watershed) based on 2013 high resolution land cover data.

| Jurisdictions | Total Tree Canopy (acres) | Forest in Urban Areas & Clusters (acres) | BASELINE Tree Canopy + Urban Forest (acres) |
|----------------------|---------------------------|--|--|
| Delaware | 6,320 | 3,414 | 9,734 |
| District of Columbia | 8,073 | 4,477 | 12,550 |
| Maryland | 317,076 | 331,308 | 648,384 |
| New York | 50,840 | 22,058 | 72,898 |
| Pennsylvania | 293,821 | 148,724 | 442,545 |
| Virginia | 407,940 | 303,375 | 711,315 |
| West Virginia | 46,069 | 15,481 | 61,549 |
| Watershed | 1,130,139 | 828,837 | 1,958,976 |

Note: Column 1 = Tree Canopy over Turf Grass and Tree Canopy over Impervious (both from Phase 6 land use). Column 2 = Forest as defined in Phase 6 model land use, exclusive of tree canopy; filtered to only 2010 Census Urban Areas and Urban Clusters.

In 2018, the Forestry Workgroup developed a proposal for a Tree Canopy Indicator that would use these data and other sources to track progress on this outcome over time. The Tree Canopy indicator was approved by Chesapeake Bay Program partners and has two components: 1) urban tree planting best management practices (BMPs) reported by states annually to track progress towards meeting the Chesapeake Bay Total Maximum Daily Load (Bay TMDL); and 2) remotely-sensed changes in tree canopy

updated approximately every five years. Both of these components combined represent the annual extent of tree canopy in the Bay watershed. Indicators and progress information for all the *Chesapeake Bay Watershed Agreement* goals are communicated via the [ChesapeakeProgress website](#), and the current page for Tree Canopy will be updated once indicator data are finalized in 2019.

III. Participating Partners

The following partners have participated in the development of this Management Strategy. An updated two-year workplan (2019-2020), which identifies additional partner commitments for implementation of actions, accompanies this Management Strategy.

Chesapeake Bay Watershed Agreement Signatories and key implementing partners:

- State of Delaware
- State of Maryland
- District of Columbia
- Commonwealth of Pennsylvania
- State of New York
- State of Virginia
- State of West Virginia
- Chesapeake Bay Commission
- USDA Forest Service
- Alliance for the Chesapeake Bay
- Cacapon Institute

The development and implementation of the Tree Canopy Management Strategy is being led by the Chesapeake Bay Program [Forestry Workgroup](#). Formed in 1989, the Forestry Workgroup is coordinated by the U.S. Department of Agriculture (USDA) Forest Service with longstanding representation from all Bay state forestry agencies and a variety of federal, state, local and nongovernmental partners. The lead state agency representatives contributing to the Tree Canopy Management Strategy are listed in Table 3 and serve as points of contact for other groups who would like to be involved with the Management Strategy.

Local Engagement

The Tree Canopy outcome will only be achieved through the efforts of local governments and their urban forestry partners working to plant, protect and maintain the community's tree canopy. Local governments play a primary role in achieving tree canopy goals by establishing and enforcing supportive policies and ordinances, providing funding and staffing, building partnerships with non-profit and private entities and tracking progress in meeting goals. Nongovernmental urban forestry partners, watershed groups and other conservation organizations often provide critical support to local governments in planting and maintaining trees, engaging volunteers and building public support. Because community governance varies significantly across the watershed in structure, policy and capacity, the Management Strategy recognizes that flexible, locally adapted approaches are needed to support tree canopy goals. The rest of this Management Strategy identifies key needs and management approaches related to local engagement, which are detailed more fully in the accompanying two-year workplan. These efforts will

be closely coordinated with the Chesapeake Bay Program Local Leadership Workgroup, the Local Government Advisory Committee and the Diversity Workgroup.

Table 3. Key Contacts for Tree Canopy Management Strategy

| Jurisdiction | Lead Agency/contact |
|-----------------------------|--|
| Federal Coordination | USDA Forest Service Julie Mawhorter, julie.mawhorter@usda.gov |
| State | |
| Delaware | Delaware Forest Service Keshia Braunskill, keshia.braunskill@state.de.us |
| District of Columbia | DDOT Urban Forestry Division Robert Corletta, robert.corletta@dc.gov District Dept. of Environment Jim Woodworth, James.Woodworth@dc.gov |
| Maryland | Maryland DNR Forest Service Marian Honecny, marian.honecny@maryland.gov |
| New York | NYSDEC, Div. Lands and Forests Gloria VanDuyne, gloria.vanduyne@dec.ny.gov |
| Pennsylvania | PA-DCNR Bureau of Forestry Rachel Reyna, rreyna@pa.gov |
| Virginia | VA Dept. of Forestry Lara Johnson, lara.johnson@dof.virginia.gov |
| West Virginia | Cacapon Institute (CB Tree Canopy Coordinator) Frank Rodgers, frodgers@cacaponinstitute.org WV Div. of Forestry Herb Peddicord, Herb.F.Peddicord@wv.gov |

IV. Factors Influencing Success

To begin engaging a broad network partners in guiding this Strategy’s development, the Chesapeake Urban Tree Canopy Summit was hosted on October 14-15, 2014 in Linthicum, Maryland by the Forestry Workgroup, Alliance for the Chesapeake Bay, and Maryland Dept. of Natural Resources, with funding support from the Environmental Protection Agency. The agenda, recorded presentations, attendee list, and Summit Proceedings report are available on the [Chesapeake Tree Canopy Network website](#). Over 80 representatives from across the watershed attended, and a larger list of over 250 “interested parties” have participated in meetings and updates on the Management Strategy process. In addition to featuring state programs, the Summit highlighted the critical role of urban forestry partner organizations who work closely with local governments on tree canopy goals – groups such as TreeBaltimore, TreeFredericksburg, Parks and People Foundation, Casey Trees, Alliance for the Chesapeake Bay, Virginia Tree Stewards, and many more.

The Summit offered an opportunity to learn about and start to prioritize the array of social and environmental factors that influence the ability to meet local tree canopy goals. The equation in Figure 2 illustrates the basic components of achieving an Urban Tree Canopy goal, demonstrating that success is not just a matter of how many trees are planted, but how existing and new trees grow and survive over time as a function of the protection and maintenance that is provided. It also shows the canopy losses

that occur through removals and mortality. Each element of this equation is influenced by a host of social and environmental factors, summarized in Figure 2 and Table 4.

Figure 2. The Basic Components of Achieving an Urban Tree Canopy Goal

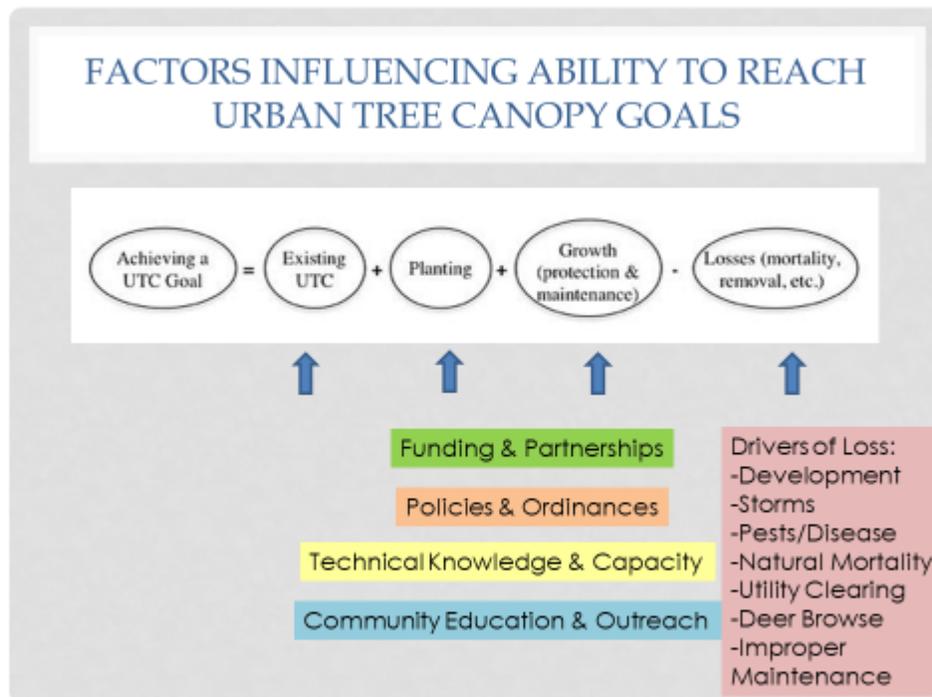


Figure 2. The Basic Components of Achieving an Urban Tree Canopy Goal

In developing the first version of this Management Strategy in 2015, the Forestry Workgroup and interested stakeholders assisted in ranking some of these key “influencing factors” to help prioritize those areas that can be impacted most readily through Management Strategy actions and collaboration. A rough ranking of these factors is included in Table 4 below. In developing the latest two-year workplan for Tree Canopy (2019-2020), the Logic Table’s list of influencing factors were renamed somewhat to be consistent with the list of factors being used across all Chesapeake Bay Program outcomes.

Hearing from stakeholders at the Summit helped to illumine a few priority needs and opportunities for the partnership to focus on first. Limited funding and capacity at the local level was a primary concern. Further, a need was expressed for making trees “count” in the context of the Chesapeake Bay TMDL – that is, ensuring that the water quality benefits of existing urban tree canopy and newly planted trees are credited in the TMDL modeling tools and BMP accounting framework. Stakeholders felt that addressing these crediting concerns would provide a stronger incentive for state and local stormwater program managers to include and invest in tree canopy as a priority practice, among other traditional and green infrastructure BMPs in Watershed Implementation Plans. These issues were a focal point in implementation of the first two-year workplan (2016-2018).

Table 4. Factors Influencing Ability to Meet Goal – ranked by priority to be addressed through Management Strategy actions

| | Rank (1=highest, 5 = lowest) |
|---|---|
| Funding/partnerships <ul style="list-style-type: none"> • State funding • Local funding • Private/foundation/other funding | 1 |
| Policies/ordinances <ul style="list-style-type: none"> • State policies/regulations • Local policies/ordinances • TMDL/Stormwater program priorities | 2 |
| Community outreach and education <ul style="list-style-type: none"> • State or CB-wide outreach campaigns • Locally driven outreach campaigns | 5 |
| Capacity/knowledge <ul style="list-style-type: none"> • Of local government • Of nonprofit/volunteers/partner groups • Of private sector | 4 |
| Key Drivers of Canopy Loss <ul style="list-style-type: none"> • Development • Storms • Pest/disease (e.g. Emerald Ash Borer, etc.) • Utility-related removals • Homeowner/property owner removals • Mortality – poor maintenance/site conditions • Natural Mortality - aging tree populations • Deer Browse | 3 |

V. Current Efforts and Gaps

Across the watershed, there are vital state and local programs that help communities with tree planting and management. Each state forestry agency, supported in part by annual Urban and Community Forestry program funding from the USDA Forest Service, delivers a variety of technical, financial, and educational assistance to help communities sustain and enhance their tree canopy. Local programs are the primary driver of tree canopy efforts, but capacity and investment varies widely across the watershed. On the whole, local programs will need to be strengthened significantly to reduce canopy losses, accelerate plantings, and bolster maintenance efforts in order to make progress in their tree canopy goals.

This section highlights some of the recent partnership actions completed to advance the Tree Canopy outcome and notes some of the critical gaps that we aim to address through management approaches and two-year workplan (2019-2020) actions.

Current Efforts - Key Areas of Progress (2016-2018 Workplan)

Management Approach 1: Bolster Funding & Partnerships

- State urban forestry grant programs and policies/regulations (where they exist) are the primary source of reported tree canopy progress at this time (Action 1.1)
- Partners worked together to develop a comprehensive guide, [Financing Urban Tree Canopy Programs: Guidebook for Local Governments in the Chesapeake Bay Watershed](#), released in March 2019. This NFWF-funded project was led by UMD Environmental Finance Center and Alliance for the Chesapeake Bay and engaged localities from the Metropolitan Washington Council of Governments and beyond. (Actions 1.2, 1.3)

Management Approach 2: Strengthen Policy & Ordinances

- The Forestry Workgroup worked with Chesapeake Bay Program partners to credit/incentivize urban tree canopy in the TMDL framework through 1) incorporating tree canopy data layers/loading rates into the Land Use Model used for the Bay TMDL and 2) defining/approving [urban tree planting and urban forest planting BMP credits](#) through the BMP Expert Panel process (Action 2.2).

Management Approach 3: Increase Technical Capacity & Knowledge

- Through the Chesapeake Bay Program's [high resolution land cover data project](#), tree canopy data are now freely available for the entire watershed and have been incorporated into the free online analysis tool [i-Tree Landscape](#) (Action 3.2) The Forestry Workgroup developed the methodology for the new Tree Canopy Indicator, which will be used to track progress utilizing a combination of land cover data updates and annual tree planting BMP data.

Management Approach 4: Expand Education & Outreach

- The Alliance for the Chesapeake Bay, USDA Forest Service, and Forestry Workgroup collaborated to launch the [Chesapeake Tree Canopy Network](#) website, which provides a hub of technical and funding information, best practices, a quarterly e-newsletter, and “community spotlight” stories from across the watershed. (Action 4.2)
- Metropolitan Washington Council of Governments was awarded a USDA Forest Service grant to complete the Tree Canopy, Environmental Justice & Community Engagement project, including a [2017 “Trees for All” regional workshop](#), pilot community projects in the Anacostia watershed, and a set of case studies that will be released in 2019 (Actions 4.1, 4.4)

While these partnership actions have been important first steps in building some foundational resources around the Tree Canopy outcome, much work remains to be done. Table 5 provides a summary of key gaps identified by partners and included in our Tree Canopy Outcome Logic Table and Two-Year Workplan.

Table 5. Key gaps/needs influencing ability to achieve Tree Canopy outcome

| Factors Influencing Outcome | Gaps |
|--|---|
| Funding and Finances | Funding (federal, state, local) to support tree canopy efforts (both planting and preservation) is still primary need cited by partners; need to work with jurisdictions and funding partners to incorporate and act on findings from Tree Canopy Financing Guide |
| Federal and State Government Agency Engagement | More engagement with other state agencies (water quality, etc.) and other federal partner agencies needed next cycle, especially around tree canopy as stormwater/MS4/WIP strategy |
| Local Government Agency Engagement | Need to ramp up local engagement for tree canopy implementation and tracking through WIP/TMDL process and through UTC network capacity building efforts |
| Legislative Engagement at State and Local Level: Policies and Ordinances | More partnership focus needed to assess and help strengthen local ordinances and policies for tree canopy planting/preservation and capacity for their implementation and/or enforcement |
| Partner Coordination | Within jurisdictions, need greater collaboration with state and local water quality/stormwater programs and NGO efforts; at CBP need greater collaboration with related outcomes and workgroups (local leadership, diversity, stewardship, schools, climate etc.) |
| Scientific and Technical Understanding: Technical Capacity and Knowledge | Need user-friendly tree tracking tool for reporting BMP progress; Need to get data, BMP information, training and resources out to more partners (e.g. local governments, NGOs, stormwater managers, etc.) |
| Public and Landowner Engagement: Education and Outreach | Need to continue and build on Tree Canopy and Environmental Justice project to reach high need/opportunity communities; Increase collaboration with CBP Green Schools efforts |
| Environmental Factors Challenging Tree Canopy progress: Population Growth (Development); Climate Change (storms, drought, etc.) Biota (pests, invasive species, etc.) Habitat Condition (poor soils, utility/infrastructure conflicts, etc. impacting urban tree plantings) | Needs more attention in future workplans, weaving in new strategic focus to integrate and address these factors |

VI. Management Approaches

This section highlights long-term partnership strategies that will continue to be pursued to address key needs and gaps for meeting the Tree Canopy outcome (Table 6). A more detailed set of near-term actions for each of the management approaches is provided in the latest two-year workplan (2019-2020).

Based on our recent review of current efforts and gaps, the following overarching priorities will be a focal point in the next two years of partnership actions, and specific requests (“asks”) that were conveyed to the Management Board in the November 2018 Strategy Review System (SRS) Meeting are noted for each.

1. Build state and local capacity through new funding and policy strategies

- ✓ Build demand through compelling messaging/outreach materials that highlight latest research on tree canopy co-benefits and new partnership opportunities
- ✓ Use Tree Canopy Financing Guide, Healthy Watershed Forest Retention Study, and proposed TC Communications and Outreach plan as a platform for new strategies and local capacity building

Management Board Asks:

- ✓ Provide CBP Communications, LGAC, and cross-outcome support for integrated messaging and outreach campaign
- ✓ Help us plant and protect more trees!
- ✓ Support action team on tree canopy funding and policy strategies with high level state representation; report recommendations to Executive Council

(note: this request has been incorporated into a “roundtable” in conjunction with the Urban Tree Canopy Summit 2.0 action below)

2. Promote tree canopy more vigorously through state and local stormwater programs and WIP efforts

- ✓ Bolster urban tree BMPs in WIP III planning efforts
- ✓ Overcome barriers to tree protection and planting in urban stormwater programs

Management Board Ask:

- ✓ Assure agency teamwork in integrating tree canopy goals in WIP planning and stormwater program delivery

3. Increase local and partner engagement in tree canopy strategies and tracking progress

- ✓ Develop user-friendly BMP Tree Tracking tool to capture local/partner efforts not currently reported
- ✓ With LGAC help, engage local partners in latest tools, data, and strategies through Chesapeake Tree Canopy Summit 2.0

Management Board Ask:

- ✓ Come to the summit! Help your local partners participate and identify funding for support

Table 6. Management Approaches (Longterm)

| Tree Canopy Management Approaches |
|--|
| <p>1. Bolster Funding & Partnerships</p> <p>1.1. Implement state programs and grants to incentivize tree canopy progress.</p> <p>1.2. Assess and summarize federal, state, local and private funding opportunities available to support local UTC implementation, including riparian forest buffers in developed areas. (COMPLETED 2016-2018)</p> <p>1.3. Provide guidance/case studies/best practices for local governments and partner organizations on how to strengthen funding and partnerships for UTC.</p> <p>1.4. Explore options for expanding UTC funding for diverse Chesapeake communities through leveraging federal, state, and private resources. (e.g. work with Bay Funders Network)</p> |
| <p>2. Strengthen Policy & Ordinances</p> <p>2.1. Review state and local policies in place to support urban tree canopy and provide recommendations on best practices, model ordinances, etc. for Bay jurisdictions</p> <p>2.2. Support efforts to credit/incentivize tree canopy protection in addition to planting in the TMDL framework. (COMPLETED 2016-2018)</p> <p>2.3. Work with stormwater program managers (federal/state/local) to better integrate urban tree canopy and riparian buffer goals with TMDL/WIP implementation and MS4 programs.</p> |
| <p>3. Increase Technical Capacity & Knowledge</p> <p>3.1. Provide guidance, training, and technical assistance to help local governments and partners develop robust urban tree canopy implementation programs.</p> <p>3.2. Support the development of Baywide high resolution UTC data updated regularly (e.g. every 5 years) to track progress/net gain. (COMPLETED 2016-2018, update ongoing)</p> <p>3.3 Work with states to develop user-friendly tracking and verification systems for groups to report urban tree planting to the Chesapeake Bay model for BMP credit, in alignment with Chesapeake Bay Program Forestry BMP Verification Guidance.</p> <p>3.4. Provide guidance and standards/best practices for tree planting and maintenance to improve long-term survival.</p> |
| <p>4. Expand Community Outreach & Education</p> <p>4.1. Work with the Diversity Workgroup and solicit guidance from LGAC and others to facilitate greater local participation, including representation of underserved and underrepresented communities.</p> <p>4.2. Use online tools/webinars/listserves to support ongoing training and information sharing in the urban forestry community of practice. (e.g. a “Chesapeake Tree Canopy” group within the existing Chesapeake Network tools)</p> <p>4.3. Develop and pilot social marketing and other innovative outreach methods to broaden community engagement in urban tree canopy implementation.</p> <p>4.4. Develop communication and outreach strategies targeted to diverse audiences, focusing on areas with greatest need and opportunity. (e.g. low canopy/underserved communities; schools, faith-based, and other civic organizations; homeowner associations; etc.)</p> <p>4.5. Continue to increase and promote the number of Arbor Day events and UTC education programs on DoD installations for military community awareness.</p> <p>4.6. Develop educational resources that expand the awareness, appreciation, planting and stewardship of fruit and nut trees within educational institutions, under-served communities, parks and other public lands.</p> |

Cross-Outcome Collaboration and Multiple Benefits

The Tree Canopy outcome overlaps with and complements a number of other Chesapeake Bay Program outcomes and workgroups and will be integrated as much as possible with these related efforts. We will continue and expand our coordination with the following Chesapeake Bay Program workgroups, and any others who express interest in working with us:

- Local Leadership Workgroup and Local Government Advisory Committee.
- Water Quality Goal Implementation Team, including Urban Stormwater Workgroup and Land Use Workgroup.
- Stewardship Goal Implementation Team, including Diversity Workgroup, Citizen Stewardship Team, Education Workgroup (schools initiatives).
- Healthy Watersheds Goal Implementation Team – forest conservation resources/tools
- Climate Resilience Workgroup.
- Communications Workgroup.

There are many opportunities to collaborate more with specific efforts that complement other GIT activities. Local Leadership – including collaboration with LGAC - is a prime area of need and opportunity, as we continue to try to build capacity, support and best practices for local funding and ordinances that support tree canopy. The Healthy Watersheds GIT's Forest Retention project will provide insight for tree canopy preservation, and the project's work related to crediting conservation is vital to tree canopy. We will continue to stay engaged in the Diversity Workgroup and coordinate future tree canopy and environmental justice engagement efforts. There is much interest in collaborating with the Education Workgroup and related goals on tree canopy implementation and education efforts on school grounds. We would like to be integrated with the Citizen Stewardship metrics/efforts where appropriate and engage with cross-GIT social marketing approaches that could be used for tree canopy. And, in the future, we plan to engage with the Climate Change Workgroup to promote tree canopy as a mitigation strategy that is particularly helpful with addressing urban heat island and public health priorities. Priority collaborative projects are noted in the current two-year workplan.

VII. Monitoring Progress

When the Tree Canopy outcome was adopted in the 2014 *Watershed Agreement*, the Chesapeake Bay Program partnership did not have a well-established mechanism for tracking progress in achieving the Tree Canopy outcome. In the last few years of partnership action, some advancements have been made. A Tree Canopy indicator methodology was developed and approved in 2018, which utilizes high resolution land cover data to track long-term gains and losses in tree canopy over time, supplemented by annual urban tree BMP data reported for the Bay TMDL.

To track real-time progress that jurisdictions and partners are making in planting trees to increase canopy, we will use annual BMP progress data that are reported for the Bay TMDL. We will use the combined reported acres of Urban Tree Planting, Urban Forest Planting, and Urban Forest Buffer BMPs to summarize progress in each state, wherever they are reported in the watershed.

Most jurisdictions are reporting some BMP data on state-funded urban tree planting, but most do not have reporting systems set up to get tree planting data from local governments and partners across the state. The Forestry Workgroup will work with state forestry partners and Phase III Watershed Implementation Plan (WIP)/Bay TMDL reporting contacts in 2019-2020 to scope and develop as needed a tree tracking tool to meet the reporting needs of states.

The annual BMP data provide the best real-time estimate of tree canopy expansion. However, this measure only captures gains, not the losses in tree canopy that we know are occurring across the landscape every day due to development, storms, rising sea levels, invasive pests such as Emerald Ash Borer and other factors. To track overall net changes in tree canopy, remotely-sensed land cover data are needed to supplement the annual BMP data.

Thanks to the Chesapeake Bay Program's investment in high-resolution land cover and land use data with tree canopy coverage, we have a remotely-sensed estimate of tree canopy throughout the watershed for 2013-14. The first planned update of the high-resolution land cover and land use data is scheduled for release in 2021 based on 2018-19 imagery. Having this second year of data will be tremendously helpful in assessing the tree canopy change that has occurred since 2013, and will help us refine the Tree Canopy indicator methodology as needed for the future.

Lessons Learned

The adaptive management process through the Chesapeake Bay Program Biennial Strategy Review System (SRS) helped the Forestry Workgroup/Tree Canopy team identify several lessons learned from the first few years of workplan implementation:

- Last workplan had a longer list of "wish list" actions than could be accomplished in the two-year period; this workplan focuses on a smaller set of priority actions through which our CBP partnership efforts can add value
- Although we made progress on key actions, more emphasis is needed on reaching out beyond our core partners to increase engagement with local efforts, stormwater programs and new partners reflecting co-benefits of tree canopy (e.g. public health)
- Local funding, policy and technical capacity continue to be high priority needs where sustained action is needed

As we begin to get better data on tree BMPs implemented and a new set of land cover data, we anticipate there will be much new learning about our progress and needs for the future.

VIII. Assessing Progress and Adaptive Management

The two-year workplan will be the main tool for focusing collaboration across federal, state, local and nongovernmental partners on Tree Canopy goals. In addition to looking at the growing body of tree planting and canopy data that will become available over the next two years, we will track progress in meeting the state and Bay-wide partnership actions set out in the workplan. Assessment of progress will also be aligned with the two-year milestone reporting required by jurisdictions under the Chesapeake Bay TMDL, as urban tree BMP data will be reported as part of meeting these milestones. Following the Chesapeake Bay Program's Biennial Strategy Review System, we will review progress, assess challenges and lessons learned, and adapt management strategies in conjunction with the Management Board review of the Tree Canopy outcome scheduled for February 2021.

IX. Biennial Workplan

The two-year workplan (2019-2010) that accompanies this Management Strategy includes the following information:

- Key actions
- Performance targets
- Partners responsible and collaborators
- Geographic location
- Timeline for the action