



Chesapeake Bay Program Climate Change Directive—Workplan

July 5th, 2022

Introduction

In October 2021, the Chesapeake Executive Council signed *Directive No. 21-1 Collective Action for Climate Change*. The Directive acknowledges the consequences of climate change on Chesapeake Bay ecosystems and communities and commits the Chesapeake Bay Program (CBP) and partners to take concerted steps to address the impacts of climate change in all aspects of the partnership's work to restore the Chesapeake Bay and its watershed. The Directive includes four primary objectives:

- Address the threats of climate change in all aspects of the partnership's work to restore the Chesapeake Bay and its watershed
- Prioritize communities and habitats most vulnerable to ever-increasing risks
- Apply the best scientific, modeling, monitoring, and planning capabilities of the Chesapeake Bay Program
- Connect Chesapeake Bay restoration goals with emerging opportunities in climate adaptation, mitigation, and resilience.

Upon the direction of the Principals' Staff Committee (PSC), in December 2021 the Management Board (MB) discussed a partnership response to the Directive and established a planning team composed of partner representatives to lead development of a workplan for implementing the Directive's objectives, to be completed by Summer 2022.

This initial workplan represents the collective effort of the planning committee and the contributions of CBP staff and experts. It presents a set of partnership-level actions that, if pursued collaboratively with strong engagement from partners and CBP programs, would accelerate progress in meeting the Directive's objectives, address critical areas of need, and help lay the necessary groundwork for future action and growth in climate readiness and resiliency in the Chesapeake Bay region. In drafting these actions, the planning committee closely considered current partner and CBP efforts supporting progress on the Directive (Appendix A), federal agency commitments (Appendix B), expertise of CBP staff, and where CBP, as a collaborative body, could complement these efforts and address urgent needs that require cooperative attention. The planning committee recommends that these actions be completed or substantively initiated by the partnership by 2024, when it should reassess progress and establish new targets.

2022-2024 Partnership Actions

1. **A Climate Directive Pilot Project:** Each signatory jurisdiction commits to launching an on-the-ground, nature-based implementation project that meets the intent of the Climate Directive and advances progress towards multiple Chesapeake Bay Agreement Outcomes, with an emphasis on projects that help achieve the forest buffer, tree canopy, or wetlands outcomes. Jurisdictions will prioritize projects located in underserved and/or climate vulnerable communities and seek input

from CBP Goal Implementation Teams and workgroups in selecting pilot project types and site locations. Projects could be supported by additional Infrastructure Investment and Jobs Act (IIJA) funding coming through CBP to the jurisdictions.

2. **Next steps for implementing the Principals Staff Committee (PSC) Monitoring Report.** Monitoring the trends and impacts of changing climate conditions on the Chesapeake Bay ecosystem and communities is critical to assessing the effectiveness of restoration practices and tracking progress and challenges towards meeting the climate resiliency goal and other goals of the *Chesapeake Bay Watershed Agreement*. The [Summary of Monitoring Needs and Investment Report](#) to the PSC (PSC Monitoring Assessment Report) finds that current monitoring programs are insufficient for meeting long-term monitoring needs across outcomes, but that new funding programs and sources in addition to new or redirected investments from partners may provide opportunities to address these needs, including towards addressing gaps in monitoring the impacts of climate change. This action includes three subtasks:
 - Identify recommendations in the PSC Monitoring Assessment Report that support ongoing climate change monitoring programs.
 - Create a forum for identifying action-oriented endpoints on investment and partnering to address climate monitoring needs. Consider funding opportunities provided by the Infrastructure Investment and Jobs Act (IIJA).
 - The Monitoring Review Team will update the partnership annually on the monitoring investment and implementation progress along with insight on new networks designs, status of development, and gaps in addressing monitoring needs.
3. **Improve understanding of Best Management Practice (BMP) responses to climate change conditions.** Further data and research are needed to understand the risks that climate change poses to BMP performance and to support implementation of climate-resilient BMPs. The Water Quality Goal Implementation Team, with support from the Climate Resiliency Workgroup and the Modeling Workgroup, will organize cross-workgroup meetings to discuss findings from recent assessments and research (e.g., Virginia Tech BMP Climate Resilience Assessment Report) to develop a research agenda framework for climate-adapted BMPs. The CBP will also support progress on priority initiatives identified in the Urban Stormwater Workgroup’s memo “Recommendations on Next Steps to Advance Efforts to Maintain Resilience of Stormwater BMPs.”
4. **Create Bay-wide plan for tidal wetland restoration, marsh migration, and coastal resiliency:** There is a need to develop a comprehensive tidal wetland restoration plan that identifies 1) recommended siting criteria for tidal wetland restoration projects that incorporates various marsh habitat benefits (e.g., low marsh for fish, high marsh for birds) and marsh and community resilience considerations, 2) potential restoration areas based on criteria, and 3) partners that could implement projects. The Management Board will identify funding to create this Bay-wide comprehensive plan to guide coordinated implementation of tidal wetland restoration projects that consider marsh migration, improve marsh and coastal community resiliency, maximize habitat benefits, and enable access to national funding programs. The Management Board will also identify a partnership lead to coordinate development of the comprehensive plan across the

various partners involved in tidal wetland restoration and/or marsh resilience planning and identify resources that can support this coordination. This project will build on the outcomes of the GIT-funded project, “Partnership-Building and Identification of Collaborative Tidal Marsh Adaptation Projects.”

5. **Refine and prioritize climate science needs and develop a resource plan.** Climate science needs for each outcome of the *2014 Chesapeake Bay Watershed Agreement* have been identified through the Strategic Science and Research Framework (SSRF). Completing and addressing the climate science needs for all the outcomes will require stronger engagement and collaboration from our partners to evolve their work to match CBP needs. The Management Board will host special sessions with support from STAR to 1) improve understanding of each outcome’s climate science needs, 2) update the status of engaged resources addressing those needs, 3) identify priority climate science needs 4) quantify required additional resources for addressing remaining gaps, 5) and develop a plan for how partner programs, expertise and resources could be further leveraged to address priority climate science needs. The partnership will present their committed efforts to support implementation of the resource plan. The SSRF will be used to document and track future climate science needs identified for the outcomes and present, on an annual basis, to the Management Board to follow through with identifying opportunities to better engage science providers who can address these needs.
6. **Improve coordination on national funding for climate:** CBP will host focused meetings with partners to improve coordination, collaborative planning, and priority-setting around funding for climate-related objectives to enable access to national funding programs. The GIT-Chairs will convene an initial set of meetings with subject matter experts (i.e., from GITS, workgroups, STAR) with the objective of identifying shared climate funding priorities and opportunities for aligning short and long-term funding proposals. A second series of meetings hosted by the Budget and Finance Workgroup will convene funders, grant-writing partners, and potential funding recipients to exchange lessons, improve understanding of national funding programs and the challenges and strategies for accessing these programs for climate change investments, and to identify potential funding routes for supporting priority climate needs. Meetings will also be used to identify opportunities for improving targeting and impact of funding on climate vulnerable communities in the Chesapeake Bay region and for improving awareness of the needs, threats, and challenges facing these communities.
7. **Complete climate change-related activities crosswalk and promote biennial reporting of climate efforts to the Climate Resiliency Workgroup:** The Management Board Climate Directive planning group will finalize the crosswalk of partner and partnership climate adaptation, mitigation, and resilience activities and present it to the Executive Council as part of the Climate Directive strategic workplan. The Management Board will take steps to promote partner participation in the Climate Resiliency Workgroup’s biennial request for information about climate adaptation, mitigation, and resilience efforts, completed as part of their Strategy Review System (SRS) process.
8. **Advance conservation finance priorities:** The Enhance Partnering, Leadership, and Management Goal Implementation Team (GIT6) and the Budget and Finance Workgroup will work with jurisdictions and GITs to showcase lessons learned from the Finance and Investment Forum held

in March 2020 (including the expert consultations), spotlight new jurisdictional innovations in conservation financing and carbon markets, and develop additional recommendations to advance these priorities.

- 9. Establish a learning and capacity building network:** Building on the efforts of the Climate Resiliency Workgroup and the Education Workgroup, CBP will take steps to support climate change education and learning and to improve awareness and institutional capacity to address climate change in all the partnership's work. The Management Board will identify partnership leads for the following actions:
- Identify and expand opportunities for partner staff to participate in comprehensive training, workshops, and in-depth topical discussions and symposia, such as through establishment of an exchange network or website.
 - Convene leaders and stakeholders in climate and environmental education to develop a common understanding of climate change education in the region and determine how learning and action related to climate change can help advance the environmental literacy goal.

Appendix A: Current and Planned Efforts to Advance the Executive Council Climate Directive

Objective 1: Address the threats of climate change in all aspects of the partnership's work to restore the Chesapeake Bay and its watershed.

Strategy 1: Integrate climate science and adaptation to climate change throughout the work of the Chesapeake Bay Program; ensure the partnership's organizational structure effectively advances this integration.

>**Delaware** Department of Natural Resources and Environmental Control Division of Coastal, Climate and Energy (DNREC-DCCE) is initiating an effort to assess the feasibility and need for climate projections using the Coupled Model Intercomparison Project Phase 6 (CMIP 6), resulting in updated rainfall and heat indicators for use in resiliency work. Sea level rise scenarios will also be updated as part of this effort.

> **Pennsylvania** published the most recent iterations of the Pennsylvania Climate Impacts Assessment and Pennsylvania Climate Action Plan in 2021. In addition to updating climate projections for the Commonwealth, [Pennsylvania Climate Impacts Assessment 2021](#) takes a risk-based approach to analyzing the consequences of climate hazards across different sectors. This approach allows for the prioritization of climate adaptation actions to the sectors facing the most severe consequences of climate change. [Pennsylvania Climate Action Plan 2021](#) outlines a pathway to reaching Pennsylvania's greenhouse gas reduction goals. The Plan also charts specific adaptation pathways for priority climate change hazards identified in Pennsylvania Climate Impacts Assessment 2021.

> The **District of Columbia** completed a vulnerability assessment in 2016 that references climate science and projections for the District of Columbia.

> **Maryland** Commission on Climate Change (MCCC) advises the Governor and General Assembly on ways to mitigate the causes of, prepare for, and adapt to the consequences of climate change. Four working groups (1. Adaptation and Resiliency, 2. Education, Communication and Outreach, 3. Mitigation, 4. Scientific and Technical) and the Climate Justice Advisory Committee inform the MCCC workplan. States agencies are required to report annually to the MCCC on the status of programs that support the state's greenhouse gas reduction efforts or address climate change.

> **New York's** Climate Leadership and Community Protection Act (Climate Act) was signed into law in 2019. New York State's Climate Act is among the most ambitious climate laws in the country and requires New York to reduce economy-wide greenhouse gas emissions 40 percent by 2030 and no less than 85 percent by 2050 from 1990 levels. The law creates a Climate Action Council charged with developing a scoping plan of recommendations to meet these targets and place New York on a path toward carbon neutrality.

> **Virginia's** Phase III WIP accounts for climate change and associated increased loads (1.7 million pounds of additional nitrogen reduction). Working with the Department of Environmental Quality's (DEQ) Office of Environmental Impact Review and Long-Range Priorities, the Virginia Chesapeake Bay TMDL program completed an internal Climate

Adaptation Strategy Analysis identifying strategies to address future climate conditions. To date, an additional twelve DEQ programs have been assessed in a similar manner.

> **The Climate Resiliency Workgroup** is working on a climate change indicator framework that identifies cross-workgroup pathways that connect climate-related physical changes with ecological and community impacts to inform adaptation strategies for the *Chesapeake Bay Watershed Agreement* Outcomes.

> **USGS is working with the CBP Office, USEPA, NOAA, and the Chesapeake Conservancy** to provide science-based information, including about climate resiliency and adaptation, that can be considered by agencies and organizations for a more strategic approach to targeting resources to achieve multiple goals and outcomes of the Chesapeake Bay Watershed Agreement. <https://gis.chesapeakebay.net/targeting/>

Strategy 2: Direct the Management Board to incorporate climate risks into the appropriate management strategies of the 2014 *Chesapeake Bay Watershed Agreement* outcomes.

> **Maryland** established an Office of Resilience in the Maryland Department of Emergency Management in 2022 (SB630) which will have authority to coordinate/integrate resilience measures across all state agencies. As a supporting measure, the State's [Climate Change Academy](#) provides climate adaptation, mitigation, and risk assessment training to local and state governments and decision makers.

> The **District of Columbia** incorporates climate risks into strategies put forth in various plans including the 2016 Climate Ready DC, 2017 Sustainable DC 2.0, 2018 Clean Energy DC, 2019 Resilient DC, and forthcoming 2022 Keep Cool DC and 2022 Carbon Free DC.

> **Delaware** will begin a Climate Leadership Academy in Spring 2022. This program is designed to help participants build competencies to effectively integrate climate change into their decision-making and professional activities, as well as advance entrepreneurship and leadership skills.

> The **Pennsylvania** GreenGov Council was established by Governor Wolf's Executive Order 2019-01 to assist state agencies in incorporating environmentally sustainable practices into policy and planning decisions. Pennsylvania's Climate Leadership Academy was established in 2021 to support the work of PA state agencies and the Pennsylvania GreenGov Council, as well as develop a community of climate smart local government and infrastructure leaders through its training and solutions development activities.

> As part of the Strategy Review System, **CBP Goal Implementation Teams and workgroups** are asked to describe how the impacts of climate change affect their progress or may influence their work to achieve Chesapeake Bay Watershed Agreement Outcomes. Answers are recorded in the Narrative Analysis section of the SRS tracking tool, Chesapeake Decisions.

Strategy 3: Work partnership-wide to ensure the science, restoration and programs equitably address the impacts of climate change on vulnerable populations, including indigenous people, historically underrepresented communities, those of lower economic status and people of color, considering existing social, economic and health disparities.

> **Delaware's** Coastal Programs Section of DNREC manages a Resilient Community Partnership that assists communities throughout Delaware that are threatened by the results of climate change, including inland flooding, coastal storms, sea level rise, and changing climate conditions. The Partnership leverages federal funding provided by the **National Oceanic and Atmospheric Administration (NOAA)** to help Delaware communities improve their planning and preparation capabilities.

> In **Virginia**, DEQ established the Office of Environmental Justice to ensure the fair and meaningful involvement of all people into the development, implementation and enforcement of environmental laws, regulations and policies across all agency programs. The 2020 General Assembly underscored the Commonwealth's and DEQ's commitment to environmental justice by adopting the Environmental Justice Act, which enhanced DEQ's statement of policy in the *Code of Virginia* to center on environmental justice considerations related to fulfilling the agency's environmental responsibilities.

> **Pennsylvania's** *Pennsylvania Climate Action Plan 2021* was developed with a focus on environmental justice and equity throughout, including equity considerations for proposed greenhouse gas reduction strategies, as well as specific adaptation pathways for mitigating the effects of climate hazards on vulnerable communities. To better inform Pennsylvania's 2024 iteration of the plan, and as we develop programs to deploy federal Bipartisan Infrastructure Law funding, PA DEP seeks to hire a contractor to develop a plan for community engagement, facilitate that engagement, solicit and coordinate input from disadvantaged communities and experts on diversity, equity and inclusion, and develop a guide that answers questions related to implementation of climate strategies for maximum benefit to disadvantaged communities and how to measure success.

> The **District of Columbia's** forthcoming Keep Cool DC includes an extreme heat exposure-sensitivity index that combines not only measurements of urban heat island effect but also demographic indicators like age, race, etc. to help identify areas that are most vulnerable to negative impacts of high heat. Actions included in the Keep Cool DC plan then prioritize implementation in the most vulnerable area.

> The **District of Columbia's** climate plans include strategies to equitably address the impacts of climate change on vulnerable populations. District Government has engaged with an Equity Advisory Group and similar community committees around the impacts of climate change on vulnerable populations since 2017.

> Launched in 2021, the **District of Columbia** Council Office of Racial Equity conducts Racial Equity Impact Assessments on almost every piece of legislation the Council proposes. To address existing inequities, the District's Office of Racial Equity develops racial equity tools and collaborates with agencies to embed racial equity in all government operations and practices.

> **Maryland's** Commission on Climate Change formed a Climate Justice Advisory Committee to ensure integration of climate justice into the Commission's approach, activities, and deliverables.

> Under the **New York** Climate Leadership and Community Protection Act, the Climate Justice Workgroup Group is tasked with establishing criteria for identifying disadvantaged communities. The Act requires a minimum of 35% of projects or investments to occur in disadvantaged communities.

- > The **Local Leadership Advisory Committee** will host climate justice sessions and develop climate justice recommendations at its 2022 Local Government Forum.
- > The **Forestry Workgroup** is initiating an effort to conduct a bay-wide assessment of forests and tree canopy using the new land use/land cover data that will include overlays with environmental justice and equity layers to better understand who is benefiting from forests and tree canopy in the watershed

Strategy 4: Continuously improve our knowledge of and response to the threats of climate change and report on implementation of this Directive and new challenges at Chesapeake Executive Council annual meetings.

- > The **District of Columbia** reports annually on the implementation of Climate Ready DC and Resilient DC which both address the current and future threats of climate change.
- > **Pennsylvania** updates its Climate Impacts Assessment and Climate Action Plan every 3 years with the latest on climate projections, hazards, and mitigation strategies.
- > **Delaware** is taking steps to develop a dashboard to track metrics for implementation of the DE Climate Action Plan Tracking and reporting are necessary to evaluate progress on emissions reduction and resilience actions. To evaluate progress over time, a suite of key metrics to track climate action will be identified and tracked.
- > **Maryland's** Coastal Adaptation Report Card provides a snapshot of the current adaptation status in Maryland's coastal counties and establishes a framework for measuring future progress. The report card scores adaptation progress across Maryland's coastal counties through 15 indicators divided in four categories—ecosystem, flooding, planning, and socioeconomic.
- > **New York's** Clean Energy Dashboard is an online resource that provides a snapshot of the utilities and New York State Energy Research and Development Authority's progress towards meeting the State's clean energy and climate agenda.
- > A **STAC** Workshop “Rising Watershed and Bay Water Temperatures—Ecological Implications and Management Responses STAC Workshop” was hosted in March. A Report and recommendations will be published later this year (2022).
- > The **Climate Resiliency Workgroup** is developing climate change indicators on Chesapeake Progress and working with the **Status and Trends Workgroup** to update the Average Air Temperature and Total Annual Precipitation Indicators.

Objective 2: Prioritize communities and habitats most vulnerable to ever-increasing risks.

Strategy 5: Prioritize achieving our outcomes to conserve and restore wetlands, forest buffers and urban tree canopies for both increased resilience to climate impacts and to assist in meeting national goals for achieving 30% of lands and waters conserved by 2030.

- > **New York's** 2020 New York State Forest Action Plan has goals to keep forests as forests, keep forests healthy, increase forest benefits for humans and all living creatures, and appreciate, support, and protect NY's forests. Each goal includes an assessment and strategy including understanding the negative effects of climate change on forests and

supporting forest management as a climate change mitigation and adaptation strategy. The Chesapeake Bay watershed was identified in the plan as a multistate priority area.

> The **Virginia** Department of Forestry (VDOT) recently established a new Watershed Program with four full-time staff to guide these efforts across the Commonwealth. VDOT also funds three Riparian Buffer Specialists to facilitate buffer conservation and establishment in priority watersheds, is piloting flexible cost-share programs to increase buffer establishment with landowners who do not qualify for other federal programs and is creating an agency-wide Riparian Buffer Action Plan to direct future buffer establishment and conservation efforts. DEQ's Office of Wetland and Stream Protection completed a Climate Adaptation Strategy Analysis which identified strategies to address future climate conditions.

> **Maryland's** Coastal Resiliency Easement initiative prioritizes wetland adaptation and community resiliency benefits as eligibility criteria for enrollment. The easement program requires the adoption of a Coastal Resiliency Management Plan that includes the delineation of a wetland adaptation buffer, prescribes marsh migration management practices, and must be updated every 10 years to address changing environmental conditions and emerging science related to climate change.

> **Delaware's** 2020 State Forest Action Plan acknowledges the long-term effects of climate change with strategies to enhance public benefits from trees and forests. The Delaware Forest Service will work with DNREC to enhance the opportunity for forest management and urban forestry carbon credits through the Regional Greenhouse Gas Initiative (RGGI). In addition, DNREC and partners are developing a Riparian Forest Buffer strategy to accelerate forested buffer implementation in both rural and urban areas of the watershed.

> **Pennsylvania Climate Action Plan 2021** charts specific adaptation pathway for addressing the impacts of increasing average temperatures on forests, ecosystems, and wildlife - one of the priority climate change hazards identified in Pennsylvania Climate Impacts Assessment 2021. Additionally, Pennsylvania DCNR's 2017 Climate Change Adaptation and Mitigation Plan outlines 123 action steps to be undertaken to make the commonwealth more resilient to potential impacts from a changing climate. The plan includes objectives to prepare for and mitigate the risks associated with potential climate impacts to Pennsylvania, including higher temperatures and more extreme weather events, range shifts for wildlife and plant species, and an increase in invasive species.

> The **District of Columbia's** Wetland Conservation Plan Goal is to achieve no net loss of District wetlands, and an eventual net gain of wetland acreage and function. In addition, the Sustainable DC 2.0 Plan includes a goal to plant and maintain an additional one hundred fifty (150) acres of wetlands in targeted conservation opportunity areas, and to reduce threats to seventy-five (75) aquatic species of greatest conservation need. Sustainable DC 2.0 also includes a goal of 40% urban tree canopy.

> The **Forestry Workgroup** is convening a Tree Canopy Funding and Policy Roundtable in late 2022 for local and state decisionmakers which will focus on tree canopy as a strategy

for equity and climate resilience. The workgroup coordinated the April 2022 Chesapeake Riparian Forest Buffer Leadership Workshop, which focused on accelerating riparian forest buffer implementation and refining state strategies for expanding forest buffers.

> The **Climate Resiliency Workgroup's** project, "Partnership-Building and Identification of Collaborative Tidal Marsh Adaptation Project" is set to kick off in June 2022 with support from FY21 GIT-funding. This project will identify and compile existing resilience metrics, geographic priorities, and organizational restoration goals from research and restoration partners and identify large-scale tidal restoration projects in MD and VA for which partners can collaboratively seek funding.

> The **Healthy Watersheds Goal Implementation Team** is incorporating climate metrics and vulnerability into their Healthy Watersheds Assessment.

Strategy 6: Build climate science and solutions into environmental literacy programs for students, the public and decision-makers, with a focus on inclusion of material on the most vulnerable habitats, people, communities, and industries.

> **Delaware's** University of Delaware Cooperative Extension has purchased a climate change curriculum for youth through the National 4-H organization. This curriculum highlights educational modules about climate change and will be tested this summer, with students who will receive guidance from adult mentors to complete hands-on projects.

> **New York's** 2019 Climate Leadership and Community Protection Act (Climate Act) required a Disadvantaged Communities Barriers and Opportunities Report that analyzed why some communities are disproportionately impacted by climate change and air pollution and have unequal access to clean energy. The report recommends actions for NYS agencies to design climate protection and clean energy programs through a lens of justice.

> The **District of Columbia's** [Environmental Literacy Plan](#) and programming includes climate science and solutions and lays out strategies for achieving environmental literacy goals.

> **Maryland's** Project Green Classrooms is integrating Climate Change Science as an element of outdoor learning environmental literacy efforts. This intersects with strategies for equitable access to natural spaces and development of environmental literacy programs in school districts lacking robust programs.

> **Pennsylvania's** Climate Leadership Academy provides a wide range of foundational and cutting-edge training for leaders who want to increase Pennsylvania's capacity to tackle climate change. These trainings are open to elected officials, leaders and staff in state and local government agencies, executive and senior personnel in critical infrastructure organizations, leaders in business, industry and agricultural sectors, and leaders of nonprofit organizations and academic institutions

> **STAR** is planning to incorporate climate change factors into CNP Tributary Summaries to help explain water quality trends.

> **The Climate Resiliency Workgroup and Local Leadership Workgroup** identified climate resiliency communication and engagement needs into the Local Engagement Needs and Resources database. The project “Planning for Clean Water: Local Government Workshops” will engage local government planners to expand understanding of these needs and discuss mutual goals and best practices for incorporating climate resilience considerations into planning decisions.

Objective 3: Apply the best scientific, modeling, monitoring and planning capabilities of the Chesapeake Bay Program.

Strategy 7: Emphasize the continued need to update best management practice design standards to account for the impacts of climate change, using leading predictive models and tools, to ensure investments made today continue to yield benefits even as the climate changes.

> **Maryland’s** State Interagency Coast Smart Council establishes Coast Smart Siting and Design Guidelines (Guidelines) that apply to state and local construction or reconstruction of certain capital projects over \$500,000, that fall water-ward of the Coast Smart Climate Ready Action Boundary (CS-CRAB) and receive at least 50% state funds. The CS-CRAB establishes a resilience boundary that addresses sea level rise inundation and coastal flood impacts.

> **Pennsylvania’s** [2020 Climate Impacts Assessment](#), Chapter 2, specifically looks at climate change impacts to PA’s watershed management strategies, including BMPs, and water quality goals (meeting TMDLs).

> The **District of Columbia’s** [Resilient Design Guidelines](#) include best management practices for buildings and landscapes that account for the impacts of climate change and include predictive models and tools for designers to ensure projects yield benefits even as the climate changes.

> **Delaware** will prioritize natural and green infrastructure solutions to enhance and protect natural resources and urban environments. Efforts will be undertaken to use “climate-smart” principles in BMP design to reduce the impact of sea level rise, coastal storms, increased temperature, and extreme precipitation events on BMP performance over time. Tools such as the Flood Planning Tool and Flood Risk Adaptation Map are used to make informed decisions about flood risk and impacts of climate change. Flexibility and adaptability will also be built into decision making by allowing for changes in BMP selection as climate and ecosystem science, research, or data become available and understanding of the impact of climatic and weather conditions on the performance of watershed restoration practices improves.

> **Virginia** is working on comprehensive resilience master planning efforts, incorporating input on a river basin and regional scale, to help identify the expected impacts of flooding throughout the Commonwealth. The Department of Conservation and Recreation is developing strategies for identifying, prioritizing, and funding projects to help mitigate

the impacts of recurrent flooding and increase resiliency. Phase I of the Coastal Resilience Master Plan was completed in December 2021; and additional planning efforts are expected to be completed for the non-coastal areas of the Commonwealth and additional coastal specific planning to add riverine, pluvial (rainfall driven) and compound flooding. DEQ's Stormwater Management Program completed a Climate Adaptation Strategy Analysis to address future climate conditions. DEQ supports the revision of NOAA's Atlas 14 to address new and anticipated climate conditions (in association with the Virginia Coastal Resilience Master Plan).

> The **Urban Stormwater Workgroup** reviewed the memo "Recommendations on Next Steps to Advance Efforts to Maintain Resilience of Stormwater BMPs" and developed a proposed resource plan for each of the priority initiatives.

> **Virginia Tech and the Chesapeake Research Consortium**, with support from CBP, completed the technical report, "A Systematic Review of Chesapeake Bay Climate Change Impacts and Uncertainty: Watershed Processes, Pollutant Delivery, and BMP Performance.

Strategy 8: Determine capacity needed to monitor the impacts of climate change on our natural resources within the existing Chesapeake Bay Program partnership's science programs and evaluate the opportunity to fill those needs with ongoing climate change monitoring programs.

> **Pennsylvania** DCNR's Climate Change Adaptation and Mitigation Plan includes a vulnerability assessment of Pennsylvania tree species to climate change. PA DCNR is also responsible for monitoring and managing destructive forest insects and diseases on all commonwealth lands.

> The **District of Columbia's** Urban Forestry Division, with the Department of Transportation, completed a vulnerability assessment of tree species to climate change impacts ([WashingtonDC_TreeSpeciesVulnerability.pdf \(forestadaptation.org\)](#)) and continuously monitors the health of the District's urban forest ([Forest Health | DDOT Urban Forestry \(dc.gov\)](#)).

> **Delaware's** National Estuarine Research Reserve has a NOAA-approved Sentinel Site. The Sentinel Site Program is a system-wide effort to understand the effects of changing water levels and tidal dynamics on the composition and distribution of marsh plant communities. Delaware's NERR collects long-term data at two sites in the state, to assess coastal habitat response to change water levels.

> **Maryland's** Resiliency through Restoration Initiative supports design and implementation of nature-based practices that enhance community resiliency to the impacts of climate change. Monitoring is being conducted to evaluate project performance and identify adaptive management opportunities in design and permitting.

> **CBP** included recommendations in the PSC Monitoring Assessment Report to invest in actions that support ongoing climate change monitoring programs (i.e., SAV, Shallow water monitoring, Ocean Acidification, Temperature).

Strategy 9: Improve the Chesapeake Assessment Scenario Tool cost calculator to account for climate change so that the partnership can ensure investments in water quality consider the impacts of delayed action

> **CBP CAST Team and the Water Quality GIT** are taking steps to build on existing efforts to quantify the carbon sequestration and ecosystem service benefits of BMPs to incorporate co-benefits information into CBP tools, including CAST. New functionality which will quantify ecosystem health outcomes by the amount of CAST water quality BMP implemented and draw connections with Chesapeake Bay Agreement outcomes is planned for the CAST toolbox.

> The **Urban Stormwater Workgroup** will work with the CAST team on developing a strategy to quantify cost of delayed action.

Objective 4: Connect Chesapeake Bay restoration goals with emerging opportunities in climate adaptation, mitigation, and resilience.

Strategy 10: Recognize, and where feasible, assess and adopt the water quality practices that sequester greenhouse gases, and the climate mitigation practices that reduce nitrogen pollution to watersheds.

> **New York** State DEC has multiple competitive grant programs for implementing water quality practices that sequester greenhouse gases and provide climate mitigation and nutrient pollution reduction. The Water Quality Improvement Project Program funds projects that reduce polluted runoff, improve water quality, and restore habitat. The Urban and Community Forestry Program Cost Share Grants aids communities comprehensive planning, management, and education to create healthy urban and community forests. The Climate Smart Communities Grant Program provides funding for climate change mitigation, adaptation, and planning and assessment projects.

> The **Virginia** Department of Forestry (VDOT) assists landowners and forest operators with harvest planning, best management practices (BMP) recommendations and site restoration guidance. VDOT also monitors BMP implementation on areas statewide to ensure that water quality is being protected through harvest inspections.

> **Maryland's** Targeted Resiliency Assessment identifies specific geographies to conduct place-based assessments and develop Comprehensive Water Quality and Climate Resilience project portfolios to implement nature-based restoration and conservation actions for risk reduction to vulnerable communities and habitats. Projects are scoped to complement each other to generate area-wide resilience benefits and leverage greenhouse gas mitigation, water quality improvements and habitat co-benefits.

> **The District of Columbia** Department of Energy and Environment (DOEE) stream and wetland restoration considers carbon sequestration and nitrogen pollution reduction. <https://doee.dc.gov/service/stream-habitat-restoration>

> **Delaware's** Climate Action Plan and Chesapeake Bay WIP have multiple linkages for practices that improve water quality and sequester greenhouse gases. Each report identifies best management practices that also offer climate benefits through carbon sequestration, reduced emissions, and enhanced resiliency to climate change. BMP selection is maximized when co-benefits are recognized like climate or coastal resiliency,

soil health, flood attenuation, habitat restoration, carbon sequestration, or socioeconomic and quality-of-life benefits.

Strategy 11: Prioritize the adoption of farming and forestry best management practices to maximize the co-benefits of improved water quality, fish and wildlife habitat, resilience, carbon sequestration and soil health.

> **New York** State Department of Agriculture and Markets launched the Climate Resilience Farming Program in 2015 to reduce the impact of agriculture on climate change and increase resiliency of NYS farms. The program has funded implementation of best management practices systems that reduce greenhouse gases, increase carbon storage in soils, and improve the health and resiliency of farms, ecosystems, and communities. Projects funded included manure storage cover and flare systems, water management projects, and soil health management practice systems.

> **Delaware's** Natural and Working Lands Policy describes the climate benefits (carbon sequestration, reduced emissions, resilience) provided by Delaware's forests, wetlands, and urban greenspaces. Practices planned for implementation, in the Agricultural Sector that benefit climate change, include non-urban stream restoration, forest buffers, tree planting, and forest harvesting practices.

> **Maryland's** Healthy Soils Program recognizes the importance of soil health and seeks to improve health, yield, and profitability of soils, increase biological activity and carbon sequestration in agricultural soils and promote further education and adoption of healthy soil practices.

> **Pennsylvania** Climate Action Plan 2021 includes greenhouse gas reduction strategies specifically aimed at increasing the deployment of agricultural BMPs such as no-till farming and integrated farm management, and tailor forest management practices to increase carbon sequestration. The plan also charts a specific adaptation pathway for addressing the impacts of a warmer and wetter climate on agriculture and addressing the impacts of increasing average temperatures on forests, ecosystems, and wildlife - two of the priority climate change hazards identified in *Pennsylvania Climate Impacts Assessment 2021*.

> The 2020 **Pennsylvania [Forest Action Plan \(PDF\)](#)** assesses the condition of the commonwealth's forests, both public and private, and sets a framework of strategies for long-term forest sustainability. The Pennsylvania Forest Action Plan describes current conditions and trends of forests across all ownerships, delineates priority landscapes, and provides a suite of broad strategies to ensure the long-term sustainability of Pennsylvania's forests and trees.

Strategy 12: Promote greenhouse gas mitigation through restoring coastal ecosystems and enhancing green infrastructure throughout the watershed.

> **Delaware** Launched the Tree for Every Delawarean Initiative as part of Delaware's comprehensive plan to respond to climate change with the goal of planting at least one tree for every Delawarean. This initiative is seeking to increase the carbon sequestration value of natural and working lands. State funding is provided for this program and is leveraged, by partners, using federal dollars.

> **New York** State Environmental Facilities Corporation administers state and federal grants and interest-free and low-cost financing for communities to implement water infrastructure projects. The Green Innovation Grant Program funds green stormwater infrastructure, energy efficiency, water efficiency, and environmental innovation projects across New York that mitigate the effects of climate change and improve water quality.

> **Maryland's** BUILD (Beneficial Use: Identifying Locations for Dredge) tool enables the spatial identification of beneficial use of dredged material opportunities to allow project planners to proactively identify sources of dredged material to place in restoration projects, or vice versa, to enhance the sustainability of coastal ecosystems and generate blue carbon benefits.

> **Pennsylvania** *Climate Action Plan 2021* includes a greenhouse gas reduction strategy specifically aimed at tailoring forest management practices to increase carbon sequestration. The plan also charts a specific adaptation pathway for addressing the impacts of increasing average temperatures on forests, ecosystems, and wildlife - one of the priority climate change hazards identified in Pennsylvania Climate Impacts Assessment 2021.

Strategy 13: Utilize conservation finance where appropriate to leverage public and increase private investments, including emerging carbon markets, in Chesapeake Bay restoration.

> The **District of Columbia's** Green Bank accelerates energy efficiency improvements and the deployment of clean energy technology by leveraging private investment, removing upfront costs, and increasing the efficiency of public dollars. The Green Bank is capitalized with limited public funds to attract private capital investment, which are then used to offer loans, credit enhancements, and other financing services to close funding gaps for energy focused retrofits, clean energy installation, clean transportation, green infrastructure, and sustainable development projects.

> **Maryland's** 2022 Conservation Finance Act (SB348) expands the ways private financing can benefit state climate, water quality, and conservation goals. The bill makes green infrastructure, natural infrastructure and a focus on social equity a bigger part of a diversity of Maryland environmental programs.

> **Pennsylvania** is currently developing a Green Bank - a facility that can translate and coordinate financing efforts and provide a communications bridge between contractors and finance providers to help finance clean energy projects. For example, Pennsylvania's Green Bank could provide product enhancements for small commercial and agriculture enterprises such as interest rate buy-down, loan loss reserve, and other credit enhancements to make financing more accessible. Pennsylvania's Green Bank could also develop new mechanisms such as a specific finance product or market facilitation to connect Green Bank Partnership investments to private capital

> **Virginia** DEQ's Clean Water Financing and Assistance Program completed a Climate Adaptation Strategy Analysis to identify strategies to address future climate conditions.

> **CBP** partner organizations (UMD, Chesapeake Bay Foundation, The Commons) are developing a Farm Conservation Certification program which would provide a site specific, scientifically rigorous, and trustworthy assessment of the greenhouse gas

reducing and carbon sequestration benefits of farm conservation practices and expand market driven incentives for conservation.

Appendix B: Federal Commitment to Implement the *Chesapeake Executive Council Directive No. 21-1 Collective Action for Climate Change*

Federal Commitment to Implement the *Chesapeake Executive Council Directive No. 21-1 Collective Action for Climate Change*

April 22, 2022



Chesapeake Bay Program

Science. Restoration. Partnership.

In alignment with mission, applicable law and budget constraints, the U.S. federal government will work together to implement the *Chesapeake Executive Council Directive No. 21-1 Collective Action for Climate Change*, recognizing that urgent attention is needed to confront the challenges that a changing climate poses to the Chesapeake Bay region. The Directive emphasizes the importance of the “...resiliency of the Chesapeake Bay Watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.” This landmark directive is consistent with Executive Order 14008 issued by President Biden in January 2021 committing the federal government to tackle the climate crisis, and with Executive Order 13508, under which federal agencies have reaffirmed their longstanding and shared commitment to protecting and restoring the Chesapeake Bay watershed.

This collective Commitment to Implement by federal agencies reflects our resolve to minimize the adverse effects of climate change on the Chesapeake Bay watershed and its habitats, and to do our part, as appropriate to our missions, to implement the Directive. Leaders of our agencies balance near and long-term priorities to reflect the ever-increasing need to implement the Directive while partnering with state and local governments, supporting urban, and underserved communities, protecting farms, forests, wildlife and habitats, and restoring and protecting water quality and living resources in the Chesapeake Bay watershed.

The federal agencies in the Chesapeake Bay Program will collectively identify opportunities to carry out the four major goals of the Directive: to address the threats of climate change in all aspects of the partnership’s work; prioritize communities, working lands, and most vulnerable habitats; apply the best scientific, modeling, monitoring and planning capabilities; and connect restoration outcomes with emerging opportunities.

Examples of the types of projects for Directive goals include enhanced technical assistance for comprehensive planning to mitigate effects of tidal wetlands, oyster reefs and submerged aquatic vegetation, soil health conservation, climate change on multiple Chesapeake Bay Program priorities including fisheries, habitat, water quality, healthy watersheds, and stewardship. Agencies will advance efforts aimed at accelerating projects to reduce flooding in communities, enhancing carbon sequestration and soil health on working lands, increasing the resiliency of habitats such as projects for living shorelines and riparian buffers, and enhancing science to forecast the effects of climate and land change to help target climate adaptation efforts. The federal agencies will look to support projects to address water-quality and habitat restoration that can take advantage of new opportunities in the Infrastructure Investment and Jobs Act and other federal appropriations.

In all these efforts, the federal departments and agencies will seek to advance environmental justice principles and commit to an ongoing partnership with tribes and underserved communities to build their adaptive capacity and address their adaptation-related priorities. As appropriate to agency missions, we will work to prioritize projects and allocate funding that promote wildlife habitat, species diversity, and climate resiliency in areas that benefit underserved communities.

U.S. Environmental Protection Agency

- Leverage the Infrastructure Investment and Jobs Act's historic funding to enhance ecosystem and community resilience in the Chesapeake Bay watershed, especially in communities which are underserved and disproportionately at risk from climate change.
- Enhance understanding of Best Management Practice (BMP) responses to climate change conditions and support implementation of climate adapted BMPs, including new and emerging BMPs.
- Identify actions in Climate Adaptation Implementation Plans that align with Directive goals; encourage collaboration to enhance outcomes.

U.S. Department of Defense

- Report on Readiness and Environmental Protection Integration (REPI), REPI Challenge, and Sentinel Landscape Projects that include climate resilience co-benefits.
- Provide a tally of dollars spent and a list of water quality best management practice project types implemented that provide climate resilience co-benefits.
- Report on the number and percentage of installations who have updated their Integrated Natural Resource Management Plans to address climate change.

National Oceanic and Atmospheric Administration

- Work with partners to conduct climate focused summer teacher workshops, develop online course that models use of Climate data tools, and support the development and implementation of a climate education needs assessment for the region
- Coordinate the Chesapeake Bay Program Climate Resiliency Workgroup with an emphasis on connecting partners to pursue nature-based climate resilience projects (e.g., coastal wetland restoration).
- Continue place-based initiatives in the Choptank complex and Middle Peninsula to identify and support oyster and nearshore habitat restoration to enhance ecological and community resilience.
- Continue operating the Chesapeake Bay Interpretive Buoy system to include temperature, salinity, hypoxia and fish telemetry observations.
- Provide research and synthesis quantifying the impact of climate change drivers on fish and habitat status and trends to support ecosystem-based fishery management.

U.S. Army Corps of Engineers

- With our partners, continue to implement projects consistent with the Final Chesapeake Bay Comprehensive Plan (January 2021).
- Through Engineering with Nature, explore opportunities to implement natural and nature-based features to enhance climate resiliency.
- Maximize use of technical assistance programs such as Planning Assistance to States, Floodplain Management Services, National Hurricane Program and Silver Jackets.
- Collaborate with and support communities, installations, other federal and state agencies, and non-governmental organizations to leverage resources and expertise to proactively address the impacts of climate change.

U.S. Department of Agriculture - National Resources Conservation Service

- Invest in climate smart commodities, expanding markets, and strengthening rural America by providing funding to partners through the USDA's Commodity Credit Corporation for pilot projects to provide incentives to producers and landowners to: implement climate-smart production practices, activities, and systems on working lands; Measure/quantify, monitor and verify the carbon and greenhouse gas (GHG) benefits associated with those practices; and develop markets and promote the resulting climate-smart commodities.
- Invest millions of dollars in the implementation of climate-smart agriculture and forestry conservation practices and conservation activities in the Chesapeake Bay.
- Continue to invest millions of dollars in locally driven, public-private partnerships to mitigate climate change and address other natural resources challenges in the Chesapeake Bay Watershed through the Regional Conservation Partnership Program (RCPP).

U.S. Geological Survey

- Enhance monitoring of relative sea-level rise, through improved measurements of land subsidence and rising waters in coastal areas.
- Conduct monitoring during extreme storm events of coastal inundation and inland flooding.
- Develop and provide tools forecasting vulnerability and likelihood of change to coastal areas from sea-level rise.
- Forecast how coastal marshes may migrate in response to on sea-level rise, sediment supply, and nearshore characteristics.
- Aggregate partnership water-temperature data across nontidal portions of the watershed and analyze data to describe status and trends in water temperature.
- Assess the potential effects of climate and land change on freshwater streams and fish populations.
- Develop web-based hub of existing decision tools so climate change can be better considered for actions to improve water quality, restore habitats, and conserving lands.
- Engage stakeholders to understand and apply findings to increase resiliency of restoration and conservation actions to climate change.

National Park Service

- Conduct Climate Vulnerability Assessments of all the coastal park sites of the Chesapeake Bay region which will provide recommendations for climate resiliency including adaptation, managed retreat, and protect-in-place decisions. The NPS has also started a dialogue with the Underground Railroad Network to Freedom members about partner sites and impacts from climate change.
- Provide technical and financial support to convene and facilitate the Chesapeake Conservation Partnership (CCP), a large landscape collaborative of government, Tribal and nonprofit partners, collectively working to conserve 30 percent of the watershed by 2030 through prioritized and targeted land conservation. The Chesapeake Conservation Partnership is focused on the nexus of conservation, equity, community resilience, and

ecosystem restoration. A new effort of the CCP called *Chesapeake Conservation Ready* will strive to collectively advance land conservation priorities within the watershed (federal and non-federal lands) and coordinate across multiple funding sources (Federal, state, local, private).

- Develop a Chesapeake Gateway Communities program to collaborate and partner with underserved Bay communities and local organizations to support and promote local resilience and community sustainability, equitable access, welcoming experiences, inclusive storytelling, community stewardship, and tourism and economic benefits tied with sectors closely linked with Chesapeake heritage, such as indigenous, handcrafted, agriculture and maritime activities.
- Continue to provide technical and financial assistance to develop and utilize Indigenous Cultural Landscape Studies in partnership and consultation with Tribal partners across the Chesapeake region so that the natural and cultural resources that supported American Indian lifeways and settlements and uniquely Indigenous perspectives can be understood and applied in land-management and climate resiliency decisions.
- Ensure consistent and meaningful Tribal consultation by establishing two permanent positions working across the Chesapeake watershed to serve as Tribal liaison.
- Utilize the Public Land Corps authority that provides youth under 30 years old and veterans under 35 years old with pathways to careers in conservation by offering direct hiring authority for two years following internships.

U.S. Fish and Wildlife Service

- Identify opportunities for restoration and protection projects that enhance ecosystem and community resilience and mitigate the effects of climate change on the Chesapeake Bay, giving particular attention to projects that augment wetlands and forest buffers.
- Build the resiliency of vulnerable ecosystems and help fish, plants, and wildlife adjust to the impacts of climate change, by investing in cutting-edge science that will guide conservation, including land and species management, and habitat restoration.
- Review best management practices and maintenance of stormwater and nonpoint source management on Refuge lands throughout the Chesapeake Bay to account for the impacts of climate change while protecting fish and wildlife habitats.
- Provide support to the Chesapeake Conservation Partnership, a landscape collaborative of Federal, State and local government, Tribal, and nonprofit partners, collectively working to conserve 30 percent of the watershed by 2030 through prioritized and targeted land conservation.
- Lead a pilot study called Targeted Outreach for Green Infrastructure to prioritize natural resources, wildlife habitats, and public infrastructure needs in underserved communities at risk due to climate change. Two cities Cambridge, MD and Williamsport, PA were chosen as pilot cities. In addition, two Tribal communities were chosen for this pilot.
- Continue to work with the Baltimore Rivers to Harbor Urban Wildlife Refuge Partnership, and the Greater Baltimore Wilderness Coalition to build resiliency of vulnerable ecosystems and populations, help communities and wildlife adjust to the impacts of climate change. The Service will look for opportunities to expand and repeat the success of these initiatives in other cities throughout the Chesapeake Bay Watershed.

- Work with underserved communities to identify vacant lots to be restored as pollinator and tree canopy habitat, for community gardens in food deserts, and to offset urban heat island effects in these communities.
- Continue to work with Upper Mattaponi, the Mattaponi, and the Pamunkey tribes on developing climate resistant and sustainable communities on Tribal lands.
- Focus environmental literacy on understanding the impacts of climate change, promoting climate change topics into formal and nonformal K-12 education and encouraging environmental stewardship throughout the Chesapeake Bay watershed.

U.S. Department of Transportation

- DOT will incorporate resilience criteria into DOT discretionary grant and loan programs, wherever appropriate. DOT may change Notices of Funding Opportunity to include project resiliency as part of the selection criteria, if appropriate. The goal is to ensure that projects supported by DOT discretionary grant and loan programs incorporate effective climate change resiliency protective features, where possible.
- DOT will enhance resilience throughout the Project Planning and Development process. DOT will evaluate and update current regulations and guidance to incorporate resilience throughout, where appropriate. If gaps are identified, new guidance may be issued. This will also include updating guidance on how resilience can be incorporated throughout the planning and environmental processes for proposed actions, including transportation planning conducted by States and Metropolitan Planning Organizations, and more holistically throughout the community. This may also include external training for stakeholders. This will ensure that Federally-funded transportation projects are planned, designed, and constructed to be resilient to climate change impacts.