Develop and Implement a Framework for a Climate Adaptive Bay and Watershed of the Future (Recommendation 1)

Climate change is rapidly and significantly altering the Chesapeake Bay and its watershed. As detailed in the CESR report, it is infeasible to return the Bay to its pre-colonial state. Therefore, the Chesapeake Bay Program (CBP) must work with partners and communities to envision a Bay of the future and enact climate adaptive measures to support a healthy system given anticipated changes. To tackle the wide scope and impact of climate challenges, such as increased storm flows, temperatures, sea levels, and storm events, and the widespread impacts these changes will have on habitats and people, the CBP needs to embrace an overall climate strategy and the capacity to support it.

Impact to how we work: Adapt partnership structure and increase capacity to effectively advance integration of climate considerations in all aspects of the partnership's work.

- Revise CBP structure (e.g., establishing a climate resilience GIT) to continue the important work of the partnership while prioritizing climate change and promoting cross-partnership work to accelerate implementation of climate adaptation measures across outcomes.
- Enhance CBP knowledge and capacity to apply scientific capabilities to respond to climate vulnerabilities, for example, by expanding the climate science support team, integrating climate science into BMPs, and promoting climate education in training materials.
- Apply decision science (e.g., structured decision making) at all levels of the CBP to support cooperative problem solving and improve outcomes under conditions of uncertainty.

Impact on Chesapeake Bay Watershed Agreement: Evaluate existing and proposed Bay Agreement goals for alignment with climate change projections and multiple benefits.

- Develop new goals that are compatible with anticipated future climate conditions and that support a healthy, equitable, and resilient Bay.
- Establish more holistic climate adaptation goal(s) and set numerical outcomes. Numeric outcomes are essential for assessing meaningful progress towards a healthy Bay.

General Level of Effort: High

- Anticipate 3+ years of time to obtain the scientific data and conduct the community engagement necessary to update the Bay Agreement goals using climate projections and local perspectives.
- Commitment of partnership time, resources for completing new assessments, and dedicated staff time to enhance coordination, structure new adaptive management processes, and conduct community engagement.

How to Strategies (Phase 2 Actions):

- Develop system for engaging watershed communities, collaboratively setting new goals, prioritizing climate adaptation strategies, and identifying indicators of progress.
- Identify climate projections, research, and data/vulnerability assessments that could help inform setting of climate-adapted goals, outcomes, management strategies, and indicators; Develop new vulnerability/impact assessments of projected climate change (complete 2035 climate assessment).

Improve the resilience of communities to key regional climate vulnerabilities. (Recommendation 2)

This approach would help mitigate impacts to the Chesapeake Bay Watershed exacerbated by climate change by helping communities protect water quality and habitat while adapting to climate change impacts such as sea level rise, extreme heat, and changing rainfall patterns. Given the inextricable link between natural systems and the human communities across the Chesapeake Bay watershed, climate considerations need to address impacts to both habitats and people. This approach would make the work of the Chesapeake Bay Program more locally relevant and could increase buy-in and participation while allowing for new partnerships.

Impact to how we work: Consider socio-ecological impacts of climate change and how community-level resilience intersects with holistic Bay health.

- Prioritize efforts and resources for adaptation projects in communities most vulnerable to ever-increasing risks or with highest cumulative risk.
- Identify ways to better incentivize community adaptation through our crediting and accountability framework with an emphasis on practices with multiple benefits (water quality, flood protection, habitat, greenspace, etc.) to communities.
- Support research into long-term monitoring of BMPs and other adaptation measures to evaluate real-world performance for community resilience in addition to Bay Program goals.
- Improve involvement and outreach by directly engaging communities and supporting efforts to build networks of practice at different scales throughout the watershed.

Impact on Chesapeake Bay Watershed Agreement: This approach could include consideration of impacts to community resilience and adaptation in other outcome management strategies, creation of a community-level adaptation outcome and principle, and development metrics towards tracking the progress.

General Level of Effort: High

- Additional resources and capacity would be required to provide technical assistance to communities in order to align community resilience priorities with opportunities associated with water quality, climate adaptation, living resources, etc.

How to Strategies (Phase 2 Actions):

- Cultivate climate-resilient communities by building community capacity to adapt to climate change (i.e., increasing adaptive capacity).
- Promote nature-based solutions to improve infrastructure to withstand the effects of climate change and incorporate into community plans and policies.
- Advance modeling and monitoring of flood impacts for coastal and inland communities.
- Support efforts to develop effective and equitable policies for relocation that account for cultural, economic, and social constraints at the individual and community level.
- Develop meaningful engagement with climate-vulnerable and climate justice communities.
- Support development of downscaled climate projections that help communities understand the future impacts of climate change across multiple indicators.
- Broaden CBP scope of climate justice to include public health and other aspects that matter to stakeholders; establish metrics related to community climate vulnerability/resilience.

Promote Carbon Stewardship as a Holistic Approach to Climate Mitigation (Recommendation 3)

Climate change poses a major threat to the sustainability of communities and ecosystems within the Chesapeake Bay watershed and will impact our ability to meet water quality and other partnership goals. The *latest IPCC report* emphasizes the urgent need to reduce emissions worldwide to mitigate the most catastrophic effects of climate change for current and future generations. Carbon stewardship is a holistic approach to climate mitigation, encompassing actions that increase carbon uptake and storage as well as actions that stabilize existing carbon stocks through land management. Practices like forest and wetland conservation, management, and restoration deliver climate mitigation benefits while ensuring ecosystems also maintain the health, function, and resiliency needed to continue delivering water quality benefits.

Impact to how we work: Use carbon stewardship as a framework to integrate climate mitigation throughout the partnership's restoration, conservation, and scientific efforts.

- Advance understanding of carbon stewardship science, including adopting carbon accounting methods to better target existing above- and below-ground carbon sinks for conservation and management and to inform BMP selection.
- Develop better incentives for carbon stewardship to improve consideration of carbon in land use planning and decision-making, increase the conservation and stewardship of carbon sinks, and improve BMP selection to support climate mitigation and build soil health.
- Use decision support frameworks for considering tradeoffs between climate mitigation and other objectives associated with projected climate and land use changes.
- Improve regional coordination around carbon stewardship using natural climate solutions by convening state and local partners already engaged in these efforts.

Impact on Chesapeake Bay Watershed Agreement: Carbon stewardship could be built into the existing agreement by developing approaches to integrate carbon considerations into management strategies for existing goals or outcomes. In addition, a new goal or outcome could be established setting carbon targets to be achieved through conservation and restoration.

General Level of Effort: High. Since the Bay Program is not currently directly engaged with climate mitigation work, significant effort would be required to develop and implement a strategy for integrating carbon stewardship into the work of the partnership.

How to Strategies (Phase 2 Actions):

- Adopt a carbon accounting strategy to quantify and communicate the carbon storage and sequestration currently being provided by ecosystems as well as the carbon impacts of current and new water quality BMPs that could deliver climate benefits.
- Identify opportunities across multiple sectors to better incentivize carbon stewardship through policies, incentives, crediting, and markets. This should include promoting the conservation and stewardship of existing carbon sinks to ensure climate resilience as well as the implementation of BMPs that deliver water quality and climate mitigation benefits. Feasibility analyses could inform how carbon crediting (including blue carbon) or more traditional markets (for forest products, agroforestry, etc.) could provide financial support.
- Identify existing national, regional, state and local natural climate solution initiatives and relevant organizations to engage to inform opportunities for improved regional coordination.

Promote strategies for healthy and productive ecosystems under changing climate conditions (Climate Recommendation 4)

Climate change is a universal stressor that affects everyone and every ecosystem in the Chesapeake Bay watershed. Ecosystem change in the watershed and Bay is occurring and will continue into the future from the changing climate conditions (e.g., rising water temperatures, shifting precipitation patterns, and sea level rise). The Chesapeake Bay Program should institutionalize the concept that the Bay of the future will not be the Bay of the past and aim to protect and conserve healthy ecosystems from climate change stressors while embracing change through adaptation that leads to positive outcomes for desired ecosystem services.

Impact to how we work: Fundamentally integrate climate stressors and adaptation when developing management responses to change.

- Advance and support long-term monitoring and assessment of compounding stressors on ecosystem health, including living resources, to improve understanding of the impacts of management and restoration actions and allow for adaptive management.
- Advance science to target and improve the design of nature-based solutions/green infrastructure to enhance confidence in their use for ecosystem and community resilience.

Impact on Chesapeake Bay Watershed Agreement: Need a program structure, goals, and success measures that allows for crosswalk between ecosystem services (e.g., habitats, living resources, water quality) that align with community needs under changing climate.

General Level of Effort: High

- Expand support for social science, communication strategies, and venues for partnership discussion on future Chesapeake Bay warming, precipitation, landscape change, carbon management and resulting impacts to ecosystem services to promote proactive approaches in preparing for and adapting to ecosystem change.
- More dedicated staff time and resources to enhance coordination and develop new processes and adaptive management mechanisms.

How to Strategies (Phase 2 Actions):

- Integrate emerging science, monitoring, and use of climate change projections to understand changes in habitat and shifts in landscapes, fisheries and wildlife.
- Develop strategies to sustain ecological function, reduce stressors and disturbances, create thermal refugia, and promote habitat connectivity and biodiversity under climate change.
- Have indicators that track and assess ecosystem health and change through improved monitoring, modeling, and forecasting to allow for climate-informed adaptive management.
- Better define compounding stressors on ecosystem health with challenges from future climate, population growth, land use, and landscape changes.
- Develop adaptation strategies for healthy ecosystem function under changing climate conditions while protecting ecosystem services in support of diversity, equity, inclusion and justice and community resilience goals.
- Pursue the development of a CBP soil health outcome and ways to support and incentivize achievement. Soil health is the basis for overall healthy ecosystems that will enhance resiliency for living resources and promote biodiversity.

Promote regenerative agricultural production and regionally based food systems in the Chesapeake Bay Watershed (Recommendation 5)

Agriculture has a major influence on water quality, local economies, communities, and ecosystem health both in local waters and in the Chesapeake Bay. Supporting a shift to regenerative food production methods and regionally based food systems would simultaneously improve climate mitigation and resilience, water quality, economic and community health, and environmental justice and equity, holistically improving the health of our watershed.

Impact to how we work: This is a long-term recommendation that, to fully realize, would require a systems-based, sustained approach. However, incremental steps to lay the groundwork will also benefit the partnership's current water quality and watershed restoration efforts.

- Increase collaboration with the growing network of producers, processors, distributors, local, state, and federal government, businesses, nonprofits, and institutions working to develop and support a regenerative and regionally based food system. Collaborative efforts could include improved utilization of market-based approaches to deliver systemic change.
- Use educational, behavioral science and marketing resources to ensure that producers and consumers understand the value of regenerative and locally sourced food for watershed restoration and have mechanisms to effectively support the transition.
- Develop mechanisms to address issues of regional carrying capacity and nutrient mass imbalance to support healthy and equitable food access and incentivize a circular approach to food and manure waste management.

Impact on Chesapeake Bay Watershed Agreement: The current Agreement does not have any goals specific to agriculture. A new goal could be set to promote regenerative and regional food systems, and an associated soil health outcome could be developed. Management strategies for some existing goals and outcomes could be modified to incorporate efforts to build and sustain soil health and support the broader effort to expand regenerative and regional food systems.

General Level of Effort: **High:** Level of effort is associated with the commitment of partnership, staff and other Bay stakeholders to evaluate new structure, processes and resources needed to enhance coordination and develop support for regenerative and regional food systems, including marketing approaches, social science, education and communication strategies.

How to Strategies (Phase 2 Actions):

- Develop a soil health outcome and new indicators to measure success that take carbon storage, sequestration, emissions reductions and other benefits into account. Outcome should apply to all soil related activities including food, fiber, forestry and lawn care.
- Determine how the partnership's scientific research, workshops, modeling, monitoring, prioritization, regulatory standards and methods, outreach, communication, education, workgroups and advisory councils could be more strategically utilized to support regenerative and regional food systems.
- Identify specific stakeholders to engage who are currently involved with efforts to develop regenerative and regional based food systems across multiple sectors.