

Executive Summary

Climate Change Adaptation
and Mitigation Priorities
Identified through Workshops
in the Chesapeake Bay Region
(Maryland and Virginia) 2022

How we address environmental justice and climate resilience will define much of what we do as a nation in the 21st century. As the world dealt with a global pandemic, the United States pushed ahead on new congressional spending on infrastructure (Infrastructure Investment and Jobs Act¹) and action (Inflation Reduction Act²) to address climate change, while the executive branch elevated its commitment to solving the challenges of environmental justice³ and climate adaptation and mitigation^{4,5}.

Maryland continues to lead on adapting and mitigating climate change, through state legislative and agency commitments and the oversight of the Maryland Commission on Climate Change. Additionally, the Maryland Conservation Finance Act of 2022⁶ and the Green and Blue Infrastructure Commission⁷, which legally defines green and blue infrastructure, support a pay-for-success financing to attract private capital investment. Virginia's "call to action" on climate is driven by its recently released Virginia Coastal Resilience Master Plan⁸ and its

1 H.R.3684 - Infrastructure Investment and Jobs Act. Enacted November 2021.

2 H.R.5376 - Inflation Reduction Act of 2022. Enacted August 2022.

3 See details of the Justice40 Initiative at: <https://www.whitehouse.gov/environmentaljustice/justice40/>

4 E.O. 13990 - Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis. Issued January 2021.

5 E.O. 14008 - Tackling the Climate Crisis at Home and Abroad. Issued January 2021.

6 SB0348 - Conservation Finance Act. Effective July 1, 2022.

7 As created by Maryland SB348/HB653. Created during the 2022 Maryland Legislative Session. See commission details at: <https://mde.maryland.gov/programs/air/ClimateChange/Pages/Green-and-Blue-Commission.aspx>

8 See full plan details at: <https://www.dcr.virginia.gov/crmp/plan>

concomitant push for local-level resilience planning. The Environmental Protection Agency Chesapeake Bay Program is working across multiple sectors and priorities to integrate adaptation and mitigation into their programming. Across the region, commitments emerged to couple environmental justice with increased community resilience to climate change.

Given these federal and state funding commitments and policy advancements, academia, nongovernmental organizations, government

agencies, communities, and industry groups have come together to identify priorities to advance work on addressing mitigation and adaptation to climate change in the Chesapeake and coastal bay regions in Maryland and adjoining states.

This summary was prepared to help highlight some of the recurring priorities voiced at a series of workshops in 2021 and 2022, and in consultation with experts across the region. This summary focuses on the role of wetlands in environmental justice and climate mitigation and adaptation. Tidal wetlands were highlighted because of their potential co-benefits, the elevation of natural and nature-based solutions⁹ to address climate change, and the recognition of a need to accelerate the Chesapeake

9 A roadmap for nature-based solutions from the Biden-Harris administration announced in November 2022. See roadmap fact sheet at: <https://www.naturebasedsolutions.gov/fact-sheet>

10 See details of the goals associated with the Chesapeake Bay Watershed Agreement at: <https://www.chesapeakebay.net/issues/whats-at-risk/wetlands>

Bay Program's ability to meet its wetland restoration targets¹⁰, which currently are estimated to fall short. The terms tidal wetlands and tidal marshes are used interchangeably in these workshops and in this summary.

Funding priorities that center around tidal marsh sustainability, restoration, expansion, and providing communities with equal access to resiliency resources are evident from the workshops conducted. We must build human capacity within communities to identify resilience needs and remain invested in the community through project design, implementation, maintenance, and monitoring. We also address the benefits of considering projects in regions where work is ongoing. In Maryland,



these include Pocomoke River Watershed, Nanticoke River Watershed, Crisfield, Baltimore's Middle Branch, Choptank River, Coastal Bays, and Dorchester County. In Virginia, several marsh sustainability and restoration projects are underway such as in Back Bay National Wildlife Refuge and Dyke Marsh Wildlife Preserve, around the Eastern Shore, and across the Middle Peninsula. This document is an effort to provide a basic summary of workshop findings to further support funding and policy action in climate change mitigation and adaptation in Maryland and beyond. However, it is important

to note that these policy and funding priorities come with caveats: (1) the workshops generally lacked participation from community members currently facing climate resilience challenges, and (2) participation from foundations, private, and non-governmental sectors was also limited. The workshops that informed this document are listed in Appendix A.

Below, we provide a brief summary of short- and long-term priorities identified during these workshops. They are loosely organized according to project ideas related to:

- 1) implementation (e.g., short-term, immediate projects); and
- 2) infrastructure changes (e.g., long-term projects and institutional change efforts).

Progress is being made on many of these priorities, but the consensus from the workshops was that these remain priorities, and as progress is made, communicating findings and adaptation efforts is a critical component for advancing community resilience. Appendix A references the workshops considered in this draft document.



Governance, People, and Institutions

Support co-development of projects and relationship-building with communities

Develop project metrics that incorporate social science and community factors beyond economic impacts

Support inter-agency and intra-agency collaboration and coordination to maximize access to funding and available expertise for project implementation

Support environmental law analysis of property rights under sea level rise scenarios

Support communication strategies to advance community adaptation and mitigation efforts and projects



Implementation

Immediate efforts to advance community engagement, build human capacity (workforce development) within communities to lead community-driven resilience decisions.

Research, Modeling, and Restoration

Advance quantification of carbon sequestration in tidal wetlands and applications to possible carbon markets

Create or identify maps to determine or pinpoint marsh areas, migration corridors, social vulnerabilities, communities at risk, private and public landowners, flooding risk, saltwater intrusion, coastal erosion, and infrastructure impacts

Improve compound (fluvial, pluvial, and coastal) flooding and multi-hazard assessment to support planning and preparation for stronger and wetter storms in the future climate



Governance, People, and Institutions

Evaluate governance structures among institutions to advance changes necessary to facilitate adaptation and mitigation efforts

Explore ways to implement a paradigm shift where adaptation and mitigation efforts proceed along a green infrastructure to hybrid infrastructure to gray infrastructure to relocation trajectory

Partner with existing efforts such as the Delmarva Restoration and Conservation Network to plan, develop projects and leverage funding

Fully support co-development with partners to advance wetland conservation by building internal community capacity and community liaison positions to assist communities in attaining their design, implementation, and monitoring of community-identified resilience projects

Support long-term, sustainable relationships with communities, private landowners, and other entities affected by relative sea level rise and coastal flooding

Develop options for farmers to adapt to recurrent high tide flooding and sea level rise, including incentives to adjust farming practices and foster wetland conservation

Infrastructure Changes

Long term projects to address wetland restoration and sustainability will require major infrastructure changes; improvement of governance structures to assist in large, collaborative projects; regional projects that address the interconnected flood risks in the Bay and estuaries; and advancements in integration of green and gray infrastructure to develop adaptive resilience design to hedge against uncertainties in future climate projections.



Research, Modeling, and Restoration

Support pre-monitoring and sustained post-monitoring and analysis of restoration projects for evaluating the performance and sustainability of nature-based and hybrid systems

Understand the use of natural and nature-based features to mitigate flood risk and how to incorporate these features into adaptive coastline management

Support modeling and field research programs to investigate regional teleconnections of flood risk in estuaries and bays and assess how local coastline management projects mitigate or amplify regional flood risks

Establish estimations of longevity and effectiveness of restoration techniques and cost-benefit analysis of undertaking restoration

Develop and maintain guidance for use of tools that inform development and management plans and/or restoration projects

Appendix A: List of Workshops

Coastal Farming Challenges: Flooding, Salt, and Land Loss

December 17, 2020, January 27, 2021,
& March 3, 2021 (virtual)

Host Organization: Maryland Sea Grant

Contact: Taryn Sudol (sudol@mdsg.umd.edu)

Research Priorities Identified:

- Develop cost-effective drainage options for farmers to adapt to recurrent high tide flooding and sea level rise
- Map current and forecasted saltwater intrusion areas
- Develop carbon credit or carbon sequestration programs and markets and other incentives for farmers to change practices on their land as it becomes wetter and saltier

2022 Restoring Wetlands of the Chesapeake Bay

August 2 – 3, 2022 (virtual)

Host Organization: Chesapeake Bay Program

Contact: Carin Bisland

Workshop Priorities:

- Understand barriers that limit tidal and nontidal wetland restoration
- Identifying approaches to increase

implementation of tidal and nontidal wetland restoration

- Develop an action plan with steps and timeline for dedicating resources

Wetland Restoration Easement (WRE) Workshops

March 18, 25, & 28, 2022 (virtual)

Host Organization: The Nature Conservancy

Contact: Mike Dryden

Workshop Priorities:

- Educate landowners and practitioners on the USDA Wetland Reserve Easement Program (WRE).

Large-Scale Marsh Persistence and Restoration in the Chesapeake Bay

October 6, 2022 (hybrid)

Host Organization: Maryland Sea Grant

Contact: Taryn Sudol (sudol@mdsg.umd.edu)

Workshop Priorities:

- Identify large-scale marsh persistence and restoration projects and research questions to be addressed

Making Waves in Equitable Coastal Resilience: A National Workshop on Social Equity and Coastal Resilience

November 1, 2, & 10, 2022 (virtual)

Host Organization: Old Dominion University and the Coastal Resilience Center with funding from the U.S. Department of Homeland Security

Contact: Wie Yusuf (JYusuf@odu.edu)

Workshop Priorities:

- Develop key research questions for advancing equity in coastal resilience,

identify best practices and lessons learned for community-based collaborative projects to advance equitable resilience, and propose recommendations for research-practice collaborations that pursue on-the-ground projects

- Focused on six primary areas: (1) Metrics and mapping of social equity and coastal community resilience; (2) equity concerns in policy analysis and decision making; (3) infrastructure planning; (4) emergency and disaster management challenges; (5) inclusion in decision making of under-served, under-resourced, or invisible communities; and (6) coastal squeeze, climigration, and equity implications.

Coastlines & People (CoPe) Research Coordination Network (RCN)

November 14-15, 2022 (in-person)

Host Organization: University of Maryland Center for Environmental Science

Contact: Ming Li (mingli@umces.edu)

Priorities Identified:

- Fund co-development of natural and nature-based features (NNBF) projects
- Increased support for pre- and post-monitoring efforts of NNBF projects
- Understanding how to incorporate NNBFs into adaptive coastline management to better mitigate flood risks
- Track project success through a diversity of metrics, including social science metrics
- Identify vulnerable communities
- Support modeling and field research programs to investigate regional teleconnections of flood risk in estuaries and bays and assess how local coastline management projects mitigate or amplify regional flood risks

- Fund innovative multiscale modeling research that integrates fine-resolution cogeomorphological models of local sites with regional flood prediction models
- Fund research to investigate the NNBF potential for regional flood mitigation by scaling up individual NNBF projects
- Fund research on compound (fluvial, pluvial and coastal) flooding and multi-hazard assessment, as storms are expected to be stronger and wetter in the future climate

Communicating Complex Science: The Challenge of Sea Level Rise

November 19, 2021 (virtual)

& May 16, 2022 (in-person)

Host Organization: Environmental Law Institute

Contact: Sandra Nichols Thiam (thiam@eli.org)

Priorities Identified:

- Improve framing and messaging to different audiences
- Empower communities by shifting from property to people
- Prioritizing certainty and urgency over uncertainty and extreme scenarios
- Adaptation issues around migration
- Distinction between long-term adaptation and emergency preparedness
- Community-led adaptation planning
- Advance education across professions (lawyers, engineers)
- Work with legal experts to develop guidance
- Proactive planning and reorganizing government to improve coastal planning
- Reframe cost-benefit analysis to account for racial and social injustices
- Grant writing assistance
- Create social justice guidelines and link to funding

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