Biennial Strategy Review System: Climate Resiliency Adaptation Logic Table

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/ Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
Stakeholder engagement.	Host a workshop or webinar event related to climate change adaptation and resilience for coastal communities.- **USACE** Explore creation of a new Community of Practice around using "Green Infrastructure" for climate resiliency. -**The Conservation Fund** Develop a "Flood Avoidance and Design Guidance" document for Delaware state agencies, **State of Delaware** Participate in the Hampton Roads Adaptation Forum, a quarterly meeting to advance sea level rise adaptation.- **Virginia Sea Grant, ODU and Hampton Roads Planning District Commission**	Facilitated discussion guided by a broad assessment framework, which links scientific and social-scientific activities needed for a cohesive Bay management strategy Lack of capacity Lack of coordination among stakeholders Lack of collaboration: many organizations across the Watershed working on climate adaptation Integrated Modeling Institutional capacity- climate change has not been fully integrated into existing Bay restoration and management efforts. Cross-cutting programmatic gaps- outcomes may need to be revised or	6.2, 7.1	Pending with action 7.1		

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	Add an interpretive component to climate change vulnerability assessments being conducted for each park.- **NPS** Participate on Greater Baltimore Wilderness Coalition Equity work group.- **Greater Baltimore Wilderness Coalition** Community partnership-building in three socially vulnerable communities in Maryland to survey residents' risk perceptions, and climate and energy policy preferences.- **GMU, MDSG Extension, JHU, City of Baltimore** Draft climate adaptation in early 2016 re: climate change and resilience with underserved communities.- **District of Columbia** EJSCREEN to prioritize new public access sites and target communities that might be in areas vulnerable to climate change impacts.- **State of Maryland**	reconsidered to accommodate anticipated climate-related changes.				

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	Explore opportunities to form new partnerships to support projects to conduct targeted policy, legal and regulatory analyses. – **Maryland and Virginia Sea Grant Programs, National Sea Grant Law Clinic** Participate in the Maryland Se Grant: Climate Change Research Forums – **Maryland Sea Grant** Conduct a workshop on the role of natural infrastructure/living shorelines as part of adaptation/mitigation strategies for the built environment **– MDSG, NWF, NARCO** Host a workshop or webinar event related to climate change adaptation and resilience for coastal communities **– USACE** Explore creation of a new Community of Practice around using "Green Infrastructure" for climate resiliency – **The Conservation Fund**					

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	Connect local policymakers and public advisory committees with information on climate change-related activities **– MWCOG** Undertake the Exploration to Explanation, Education to Conservation project,**–MDDNR, MADE CLEAR, NCBO**					
Legislative, regulatory and/or policy directive/authority	The Chesapeake Bay Commission will work collaboratively with the Bay Program partners to identify legislative, budgetary and policy needs to advance the goals of the Chesapeake Watershed Agreement. **Chesapeake Bay Commission** Explore opportunities to form new partnerships, to support projects to conduct targeted policy, legal and regulatory analyses.- **Maryland and Virginia Sea Grant programs**, **National Sea Grant Law Clinic**	Lack of knowledge of institutional barriers Lack of incorporation of climate change across programs	2.1, 3.3			

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	Connect local policymakers and public advisory committees with information on climate change-related activities.- **MWCOG**					
Development of specific climate adaptation principles (e.g., BMP siting and design).	Chesapeake Atlantis Model as a tool to integrate available scientific information on the biology, habitats (physical and water column), and physical drivers (climate effects), **NCBO** Track local government and water utility climate adaptation efforts in the MWCOG region and develop recommendations for other geographic areas **MWCOG** Explore the development of a spatially explicit adaptation project/plan database for the Mid-Atlantic Region modeled after EPA Region 2 effort. **EPA Region 3**	Need for Coordination of Modeling: integrated modeling that includes climate change Need a comprehensive understanding of current science and management actions Lack of Indicators to track progress	1.1, 7.2	Implementation of adaptation indicators (pending)	Adaptation indicators will assist the CRWG in focusing its guidance and efforts	

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	Participate in the Maryland Sea Grant: Climate Change Research Forums- **Maryland Sea Grant** Conduct a Coastal Resiliency Assessment to identify conservation and restoration - **Maryland DNR, The Nature Conservancy** Develop a "Flood Avoidance and Design Guidance" document for Delaware state agencies.- **State of Delaware** Initiate project to apply EPA's wetlands vulnerability framework to several areas within the Chesapeake Bay.- **US EPA** Improve technical understanding for successful restoration projects. USGS activities include research to optimize the design of restored non-tidal freshwater wetlands for water-quality benefits and an addition study of the water-quality benefits of floodplain restoration along the Pocomoke River.- **USGS, USDA, TNC**					

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	Participate in the Hampton Roads Adaptation Forum - **Virginia Sea Grant, ODU and Hampton Roads Planning District Commission** Develop wetland restoration priorities for climate risk reduction and resilience in the Mid-Atlantic region.- **MARCO** Implement the Trout Unlimited's Potomac Headwaters Home River Initiative. .- **TNC** Explore applications of the Chesapeake Atlantis Model as a tool to integrate available scientific information on the biology, habitats (physical and water column), and physical drivers (climate effects- **NCBO**					
Variable adaptation approaches.	Track local government and water utility climate adaptation efforts in the MWCOG region and develop recommendations for potentially	Lack of Indicators to help track progress and establish metrics that can be applied across the watershed in coordinated fashion.	4.1, 5.3			

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	replicating those efforts in other geographic areas (mainly urban/suburban landscapes).- **MWCOG** Explore the development of a spatially explicit adaptation project/plan database for the Mid-Atlantic Region modeled after EPA Region 2 effort. – **EPA Region 3** Participate in the Maryland Sea Grant: Climate Change Research Forums- **Maryland Sea Grant** Conduct a workshop on the role of natural infrastructure/living shorelines as part of adaptation/mitigation strategies for the built environment.- **MDSG, NWF< MARCO** Host a workshop or webinar event related to climate change adaptation and resilience for coastal communities.- **USACE**	Cross-cutting programmatic gaps- The 29 Individual Management strategies may need to be revised to accommodate anticipated climate-related changes or impacts. Climate Science gaps: Need a comprehensive understanding of the current science and management actions, as well as the availability of future climate projections. Need improved scientific capabilities to monitor, model, and assess ecosystem response.				

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	Explore creation of a new Community of Practice around using "Green Infrastructure" for climate resiliency. – **The Conservation Fund** Initiate project to apply EPA's wetlands vulnerability framework to several areas within the Chesapeake Bay - **USEPA** Explore applicability of EPA Climate Change and Storm water Design Guide for Chesapeake Bay specific practices, soils, and climate changes.- **USEPA** The USACE Climate Preparedness and Resilience Community of Practice will release annually its Climate Change Adaptation Plan, **USACE** Explore applications of the Chesapeake Atlantis Model as a tool to integrate available scientific information on the biology, habitats (physical and water column), and physical drivers (climate effects)**NCBO**					

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Scientific and technical understanding	Work with UMCES, IAN to identify lessons learned through the development process for the Climate Resilience Index (2015).- **UMCES, IAN** Explore applications of the Chesapeake Atlantis Model as a tool to integrate available scientific information on the biology, habitats (physical and water column), and physical drivers (climate effects), **NCBO** Participate in the Hampton Roads Adaptation Forum **Virginia Sea Grant, ODU, and Hampton Roads Planning District Commission** Improve technical understanding for successful restoration projects. USGS activities include research to optimize the design of restored nontidal freshwater wetlands for water-quality benefits and an addition study of the water-quality benefits of floodplain restoration along the Pocomoke River.- **USGS, USDA, TNC**	Climate Science gaps: Need a comprehensive understanding of the current science and management actions, as well as the availability of future climate projections. Need improved scientific capabilities to monitor, model, and assess ecosystem response. Indicator development- to track progress Linking Science to Implementation	3.1			

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	Initiate project to apply EPA's wetlands vulnerability framework to several areas within the Chesapeake Bay.= **US EPA** USACE is contributing to the Nation's resilience to climate change through its planning, engineering, design, construction, operations and maintenance, and research and development activities. **USACE** Conduct a Coastal Resiliency Assessment to identify conservation and restoration priorities based on shoreline and community exposure and social vulnerability to flooding, storm surge, sea level rise, and wave action.- **MDDNR, The Nature Conservancy**					
Funding: Patchwork of funding resources and changes in funding	Review, update, and prioritize the recommendations of VA's 2008 Climate Change Action Plan and identify sources of revenue to fund the implementation**VA Climate Change and Resiliency Update Commission**	Lack of consistent funding Lack of funding around Coordination of priorities Lack of strategy that pulls together all of the disparate parts	3.2			

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priorities at various levels.	Integrate resiliency into the state's Working Waterfronts Program. DNR to offer Working Waterfronts Enhancement Grants to local governments to support revitalization of working waterfront communities and economies.- **MDDNR** Pennsylvania's TreeVitalize program :a funding mechanism that is included in the Chesapeake Bay Program Urban Tree Canopy's Biennial Work plan.- **PA DCNR Bureau of Forestry and PSU Extension**					
Competing priorities.	Integrate resiliency into the state's Working Waterfronts Program. DNR to offer Working Waterfronts Enhancement Grants to local governments to support revitalization of working waterfront communities and economies. **MDDNR**	*Cross-cutting programmatic goals: Ensuring 29 strategies include actions to address climate change impacts, and linking those impacts to the unique strategy.*	6.2, 7.1			

	ADAPTATION WORK PLAN ACTIONS				
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Action #	**Description**	**Performance Target(s)**	**Responsible Party (or Parties)**	**Geographic Location**	**Expected Timeline**
Management Approach 1: Compile and assess current adaptation efforts and lessons learned.					
1.1	Compile and assess lessons learned from past and ongoing adaptation planning and programmatic efforts within the Chesapeake Bay Watershed.	Develop need and format for information to be gathered and a methodology for updating list and synthesis on a continual basis.	CRWG	Watershed	Complete.
		Informed by step above, work from Appendix B to compile an expanded list of current planning and programmatic efforts that support key elements of the Management Strategy.	CRWG	Watershed	Complete.
Management Approach 2: Continually pursue, design and construct restoration and protection projects to enhance the resiliency of the Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms and sea level rise.					
2.1	Develop process to revise or reconsider Watershed Agreement Management Strategies to accommodate anticipated climate-related changes or impacts.	Facilitate in-person workshops with Wetlands and Protected Lands Work to complete Matrix Analysis process and revise, modify, prioritize and select management actions for integration into Management Strategies; and 2) to develop recommendations for augmenting existing Management Strategies through the “Adaptive Management” framework.	CRWG	Watershed	Complete.
		Develop recommendations for refinement of matrix and a proposed implementation process to engage one-on-one with GITS and Workgroups to identify, assess, evaluate and revise (as necessary) all individual CB Agreement Management Strategies.	CRWG	Watershed	Complete.
Management Approach 3: Increase the institutional capacity of the Chesapeake Bay Program to prepare for and respond to climate change.					
3.1	Increase opportunities for formal and informal communication and the exchange of ideas among the Chesapeake Bay watershed’s	Work with partners to host a “Chesapeake Bay Climate Adaptation Workshop" or offer adaptation related trainings at appropriate regional forums and conferences.	CRWG	Watershed	

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	"adaptation planning network."				
3.2	Identify funding availability, needs and mechanisms.	No collective action identified.	CRWG	Watershed	
3.3	Identify and assess institutional barriers.	No collective action identified.	CRWG	Watershed	
Management Approach 4: Implement Priority Adaptation Actions					
4.1	Plan and implement targeted restoration and protection efforts that build community and ecosystem resilience within the Bay watershed.	Identify additional on-the-ground projects proposed or planned by CB partners, to be implemented within the next two years and beyond.	CRWG	Watershed	
		Opportunistically, assess planned on-the-ground restoration projects, proposed by CB Partners, to evaluate whether project designs accommodate for climate change; and, where possible, develop metrics for and/or monitor a specific projects performance over time.	CRWG	Watershed	
		Participate in the SAGE Chesapeake Bay Pilot to develop "living" models of green/gray infrastructure for coastal community protection and improved resilience of natural resources; evaluate alternative SAGE project financing approaches; share information across federal, state, and local agencies, NGOs, academic institutions, and multiple business sectors (e.g., engineering, finance).	CRWG	Watershed	
Management Approach 5: Undertake Local, Public and Stakeholder Engagement & Conduct Targeted Education and Outreach					
5.1	Share current efforts, including policy, tools, products, and scientific understanding with interested parties.	Work with CBP Communications Workgroup to release a periodic newsletter to disseminate adaptation-related information.	CRWG	Watershed	Ongoing

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5.2	Test and develop new communication tools that are audience specific so that climate information is accessible and understandable across multiple audiences and communities.	No collective action identified.	CRWG	Watershed	
5.3	Develop information products that can be used to inform community-led coastal resiliency planning processes.	No collective action identified.	CRWG	Watershed	
Management Approach 6: Foster a larger discussion on the linkage between climate impacts and diversity					
6.1	Work with the Diversity Action Team to identify and pursue opportunities to create a strong linkage between the Climate Resiliency and Diversity Management Strategy.	Climate Resiliency Workgroup member to serve on the Diversity Action Team.	CRWG	Watershed	Ongoing
		Include climate change mapping layers in Diversity Action Team project to develop a customized Chesapeake Bay EJ Screen Tool.	Diversity Action Team	Watershed	Ongoing
6.2	Undertake targeted efforts to engage diverse stakeholders.	No collective action identified.	CRWG	Watershed	
Management Approach 7: Track adaptation action effectiveness and ecological response					
7.1	Assess progress towards the full integration of climate resilience considerations into the Chesapeake Bay Program.	Develop a questionnaire or matrix to document programmatic baselines and monitor the status and progress towards incorporating climate factors into individual management strategies.	CRWG	Watershed	Complete

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7.2	Investigate climate resilience indicators to assess adaptation action effectiveness and ecological response.	Interface with NFWF/DOI, USGRCP and US EPA to review other climate indicator frameworks (DOI Metrics, USGRCP and US EPA Climate Change Indicators (http://www3.epa.gov/climatechange/science/indicators/) to assess suitability for application to CBP related activities.	CRWG	Watershed	Complete.
		Track Department of Interior Metrics Expert Group (MEG) recommendations for measuring effects of ecological resilience projects to protect key features/ systems and some forms of grey infrastructure against effects of coastal storms and climate change effects (e.g., sea level rise, storm surge).	CRWG	Watershed	
		Work with STAR and STAC to recommend and establish performance metrics and/or indicators to assess Climate Resiliency Goal and Outcome implementation effectiveness, as well as ecological response.	CRWG	Watershed	Sept. 2018