Logic and Action Plan: Pre-Quarterly Progress Meeting

Climate Monitoring & Assessment and Climate Adaptation – 2023-2024

*[NOTE: make sure to edit **pre**- or **post**- in the text above, to tell the reader whether this logic and action plan is in preparation for your quarterly progress meeting or has been updated based on discussion at the quarterly progress meeting.]*

Long-term Target: (the metric for success of Outcome)
Two-year Target: (increment of metric for success)

Instructions: Before your quarterly progress meeting, provide the status of individual actions in the table below using this color key.
Action has been completed or is moving forward as planned.
Action has encountered minor obstacles.
Action has not been taken or has encountered a serious barrier.

Additional instructions for completing or updating your logic and action plan can be found on ChesapeakeDecisions.

Factor	Current Efforts	Gap	Actions	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 help fill this gap) to achieve our outcome?*	*What will we measure or observe to determine progress in filling identified gap?*	*How and when do we expect these actions to address the identified gap? How might that affect our work going forward?*	*What did we learn from taking this action? How will this lesson impact our work?*
Outcome: Monitoring & Assessment						
Monitoring & Assessment: Scientific Capabilities. The scientific capabilities to estimate, project, model and monitor ecosystem changes and impacts as a result of climate change are complex and resource intensive. Additionally, impacts are exacerbated by non-climate stressors (e.g., land-subsidence, land use change, growth and development). Appropriate science and modeling of climate and non-climate related stressors are necessary for Chesapeake Bay Program partners to properly address climate impacts during policy	Development of climate change indicators on Chesapeake Progress. ITAT Tidal Trends Analyses; Bay Trends Interactive Map Application of the climate change TMDL model.	Need scientific capability to monitor climate and other stressors simultaneously; need to ensure that long-term monitoring networks include key parameters to assess climate change impacts and coincide with monitoring other stressors when feasible; need to sustain and support long-term monitoring networks (e.g., CBP Monitoring Network, Sediment Elevation Table Marsh Studies); need adequate	1.1, 1.2, 1.3, 1.4, 1.5		Development of climate change indicators will depend on the quality of supporting data, the added value of the indicators for helping to understand and explain management successes, and the priorities and resources of the CBP Partnership. CRWG is planning to develop 1-2 new climate change indicators during 2021-2022.	

planning and adaptation efforts.		downscaled climate modeling data and data to develop and test models; need continued efforts to understand thresholds of climate stressors on water quality, fisheries, and habitats, interaction of multiple stressors, and quantification of co-benefits.				
Monitoring & Assessment: Geographic Extent/Variability of the Watershed. The impacts of climate change will be varied across the Watershed. It is important to not limit the focus of the management strategy to coastal issues alone but to recognize the wide range of monitoring, assessment and adaptation needs throughout the region. However, the variability of the ecosystem within the Bay proper and the larger watershed presents challenges in data consistency and	Scientific data collection at DE, MD, VA NERRS sites to gain a better understanding of what is happening at the reserve level and how that can be applied to the Bay as a whole. Healthy Watersheds is incorporating climate metrics and vulnerability into their Healthy	Need methods aimed to improve data consistency and comparability among regions and sectors.	1.2c; 1.4; 1.5		Currently, the CRWG does not have adequate resources to tackle both Bay and watershed climate change assessment needs across workgroups simultaneously. Need partner support.	

comparability among regions and sectors.	Watersheds Assessment.					
Monitoring & Assessment: Complexity of the Monitoring Program. A monitoring program to detect ecosystem change and inform program and project response is a complex undertaking. Developing an acceptable monitoring approach for the watershed will be complex, and there are clear budgetary challenges associated with such long-term monitoring.	Data collected by NOAA Chesapeake Bay Sentinel Site Cooperative (CBSSC) and satellite office, CBP Monitoring Network. Completion of, "Enhancing the Chesapeake Bay Program Monitoring Networks: A Report to the Principals' Staff Committee." Outlines various climate-related monitoring and assessment needs.	Need to identify and connect climate resilience science needs for adaptation decision-making with monitoring needs; need institution capacity to develop and perform long-term monitoring to detect ecosystem change and a steady funding source for such efforts; need to evaluate alternative monitoring strategies, such as use of satellite data.	2.5		CRWG has the capacity to provide information on science needs related to climate stressors that can be considered and integrated in monitoring networks by the Integrated Monitoring Network Workgroup.	
Outcome: Adaptation						
Adaptation: Stakeholder Engagement. Although there is acknowledgement that climate change and adaptation need to be addressed, there is a lack of understanding or	Collaborating with the Strategic Engagement Team on connecting climate resiliency work	Need collective agreement; need better understanding of stakeholder climate resilience and adaptation decision-making needs; need	2.1; 2.3		Limited CRWG staff resources makes it difficult to make progress on this factor.	

agreement from stakeholders on what it means to be resilient or what constitutes resiliency, including what kind of actions support an adaptive management approach. Lack of appropriate stakeholder engagement jeopardizes acceptance of choices made about action plans and implementation strategies, introducing additional levels of social discord in an already complex environmental-economic-social landscape. There are also different types of stakeholders, and in many cases, they have different goals making it challenging to have adequate resources to facilitate meaningful connections across all stakeholder groups.	with local community needs.	facilitation in connecting the science across the different stakeholder groups to support decision-making; need stakeholder support in implementing recommendations; need willingness to discuss managed retreat as an option				
Adaptation: Capacity. There is a general lack of capacity to fill research gaps and translate the science and incorporate meaningful change into plans, programs, processes or projects across the entire CBP partnership. Although	Marsh Adaptation Project	Knowledge of types of technical assistance/expertise needed by jurisdictions.	2.2; 2.4			

building that capacity is paramount, it can be time consuming and costly, considering the resource constraints faced by governments and organizations and the variability in adaptation approaches.						
Adaptation: Authority. Governments' and institutions' ability to respond to climate change is also limited by legislative, policy, regulatory and other authorities.	Individual jurisdictional incorporation of climate narrative (or voluntary numerical target) into WIPs III. States and communities around the Chesapeake Bay are taking steps to prepare or maintain their climate change adaptation or sustainability plans.	Need knowledge of institutional/ regulatory barriers; need incorporation of climate change considerations across programs.	1.4; 2.7			
Adaptation: Guidance. There is a need to translate existing science into guidance for the CBP, as well as stakeholders, to use to develop adaptation plans and to measure efficacy of response to climate	Ongoing research and models, tools and metric development by CBP partners.	Need development of clear tools and guidance to develop plans and efficacy of response; lack of extensive information (or information dissemination) on	2.1; 2.3; 1.2			

change impacts. The nature of on-the-ground implementation often requires a level of certainty or methods to address uncertainty related to climate change effects on key factors (e.g., hydrology, water quality, temperature, precipitation, sea level rise, coastal erosion rates). Additionally, there is variability in institutional responses on how to address climate change impacts making it challenging to develop guidance that can be applied consistently across all watershed jurisdictions.		the costs of climate change impacts in specific areas, or the cost savings and ecosystem benefits represented by specific mitigation or adaptation measures.				
Adaptation: Collaboration. The many and diverse stakeholders and organizations that make up the Bay Program are a strength, but it also causes collaboration challenges that must be addressed in order to maximize resources and provide strategic adaptation approaches across the watershed.	The Climate Resiliency Workgroup meets monthly to discuss a variety of climate topics and provide a forum for information-sharing to encourage collaboration.	Need to achieve strategic collaboration across the other goals in the Chesapeake Bay Watershed Agreement that maximizes resources and connects science to inform decision-making; need consensus on strategic adaptation approaches that fit the impact and area of concern	2.4; 2.5; 2.6; 2.7			

Monitoring & Assessment Actions – 2023 - 2024						
Action #	Description	Performance Target(s)	Responsible Party (or Parties)/ Point of Contacts	Geographic Location	Expected Timeline	Progress Status
Management Approach 1: Assess past and future trends of climate change in the Chesapeake Bay and watershed in connection with the goals in the Chesapeake Bay Watershed Agreement						
1.1	Coordinate updates for prioritized climate change indicators on Chesapeake Progress	a. Finish updates for the Average Air Temperature Change and Total Annual Precipitation Change climate indicators. b. Revise text on Chesapeake Progress to better align with current climate change indicator efforts.	a. Jamileh Soueidan (CRC/CRWG Staffer); Kathryn Barnhart (U.S. EPA/Status and Trends Workgroup); Mike Kolian (U.S. EPA) b. Jamileh Soueidan (CRC/CRWG Staffer); Julie Reichert-Nguyen (NOAA/CRWG)	Bay/ watershed-wide	Updating climate change indicators will rely on available data and assistance from data providers/ analysts from other agencies.	
1.2	Coordinate the development of prioritized climate change indicators in connection with clear management objectives with corresponding workgroups and natural resource outcomes	a. Support cross-workgroup discussions to identify user case scenarios on how best to incorporate living resource-related outcome needs (e.g., fish habitat, SAV) when developing the Bay Water Temperature Change climate change indicator. Meet with potential data providers/analysts (e.g., NOAA, ITAT) to assess feasibility of approaches and support to	a. Julie Reichert-Nguyen (NOAA/CRWG); Jamileh Soueidan (CRC/CRWG staffer); Bruce Vogt (NOAA/Fisheries GIT); Support: Peter Tango (USGS/STAR)?; Breck Sullivan (USGS/STAR coordinator)?; Rebecca Murphy	a/b. Bay-wide or place-based (depends on discussions) c. Watershed-wide or place-based	CRWG plans to make progress on the development of 1-2 climate change indicators during 2023-2024. Development of new indicators will depend on the quality of supporting data,	

		develop and maintain the indicator(s). b. Assess the inclusion of multiple stressor-type information for the Bay Temperature Change Indicator related to marine heat waves and dissolved oxygen based on recommendations and science needs expressed during the Rising Water Temperature STAC workshop. c. In coordination with Healthy Watersheds GIT, Brook Trout Workgroup, and Stream Health Workgroup, continue exploring collaborations with USGS to connect their stream temperature compilation project with updating the stream temperature change indicator. Assess use in the Healthy Watersheds Assessment related to brook trout habitat and stream health and the identification of potential resilience landscape and/or BMP factors.	(UMCES/ITAT)?; Brooke Landry (MDNR/SAV Workgroup)?; Justin Shapiro (CRC/Fisheries GIT) b. Julie Reichert-Nguyen (NOAA/CRWG); Jamileh Soueidan (CRC/CRWG staffer); Support: Peter Tango (USGS)?; NOAA Chesapeake Bay Office; Hypoxia Collaborative? c. Renee Thompson (USGS/Healthy Watersheds); Stephen Faulkner (USGS/Brook Trout Workgroup); Jamileh Soueidan (CRC/CRWG staffer); John Clune (USGS); Alison Santoro (MDNR/Stream Health Workgroup); Taylor Woods (USGS)		cross-workgroup involvement, and the priorities and resources of the CBP Partnership.	

Management Approach 2: Fill critical data and research gaps and improve understanding of climate change impacts and implications for selected outcomes in the Chesapeake Bay Watershed Agreement						
1.3	Increase capacity to better understand sea level rise effects on coastal marsh habitats and their ecosystem services	a. Review recommendations from the Habitat GIT's FY20 GIT-funding project, "Synthesizing shoreline, sea level rise, and marsh migration data to inform wetland restoration targeting" and explore use of the synthesis product to inform decision-making for coastal adaptation projects (see action 2.2). b. Explore partnerships and methods to quantify current and projected coastal wetland losses from sea level rise and wetland gains from marsh migration, in coordination with the Wetland WG.	a. Julie Reichert-Nguyen (NOAA/CRWG), Jamileh Soueidan (CRC/CRWG Staffer) Molly Mitchell (VIMS/CRWG); Nicole Carlozo (MDNR/CRWG); Contractor: Skeo b. Julie Reichert-Nguyen (NOAA/CRWG); Jamileh Soueidan (CRC/CRWG staffer); STAR staffer?; Support: Joel Carr (USGS/CRWG)?; Neil Ganju (USGS)?; Labeeb Ahmed (USGS/GIS Team/CRWG)?; Peter Claggett (USGS); Wetland WG member?	a. Placed-based (target area – Middle Peninsula, VA) b. Bay/ watershed-wide or place-based (depends on decided methodology)		
1.4	Coordinate with the Modeling Workgroup and the Water Quality Goal Implementation	a. Provide advisory support to the Modeling Workgroup and Water Quality GIT on the application of the TMDL climate	a. Mark Bennett (USGS/CRWG), Lew Linker (EPA/Modeling WG),	a. Bay/ watershed- wide		

	Team (WQGIT) to support the application of TMDL climate change projections	change model projections and any updates for 2025.	Jeremy Hanson (CRC/WQGIT)			
1.5	Improve understanding of best management practices (BMP) responses to climate change conditions	a. Provide advisory support on EPA Request for Applications related to BMP climate resilience research. Supports action in the Executive Council Climate Change Directive Workplan.	a. CRWG: Mark Bennett (USGS), Julie Reichert-Nguyen (NOAA); WQGIT: Ed Dunne (DOEE), Jeremy Hanson (CRC), Lucinda Power (EPA); Modeling Workgroup: Lew Linker (U.S. EPA)	a. Bay/ watershed- wide		

Adaptation Actions – 2023 - 2024						
Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline	Progress Status
Management Approach 1: Improve knowledge and capacity to implement and track priority adaptation actions in connection with the goals in the Chesapeake Bay Watershed Agreement						
2.1	Support efforts to identify approaches to track climate resilience activities and define resilience enhancement	a. Plan discussions during CRWG meetings on how the CRWG can feasibly track progress on the Adaptation Outcome. b. Invite researchers to present on how they are quantifying	a/b. Jackie Specht (TNC/CRWG), Julie Reichert-Nguyen (NOAA/CRWG), Jamileh Soueidan (CRC/CRWG staffer);	a/b. Bay/ watershed-wide c. VA		

		resilience effectiveness in relation to habitat and community resilience. c. Support EPA ORD ROAR project - Climate Vulnerability and Natural Infrastructure Resilience Effectiveness Assessment (if funded).	Elizabeth Andrews (RAFT/CRWG)? Lena Easton-Calabria (RAND/CRWG)? c. Julie Reichert-Nguyen (NOAA/CRWG); Kyle Buck (EPA ORD); NOAA Chesapeake Bay Office			
2.2	Assist with capacity-building activities that support the implementation, pairing, and design of natural infrastructure projects that enhance the resiliency of the Bay and aquatic ecosystems from coastal climate change impacts	a. Continue to support the GIT-funded Marsh Adaptation Project: 1) Synthesize and promote use of common resilience and social vulnerability metrics for selecting marsh restoration locations and measuring success and 2) build partnerships to pursue marsh restoration and research projects under the influx of resiliency funding through alignment of priorities. Supports action in the Executive Council Climate Change Directive Workplan. b. Through a possible GIT-funding project, build upon the resilience metrics review (see action 2.2a) and synthesize information and methodologies from the various partner resilience tools and	a. CRWG: Nicole Carlozo (MDNR), Jackie Specht (TNC), Taryn Sudol (MD Sea Grant), Julie Reichert-Nguyen (NOAA), Jamileh Soueidan (CRC/CRWG staffer), Alex Gunnerson (CRC/STAR staffer); John Wolf (USGS, CBP GIS Team); Contractor: Skeo b. Julie Reichert-Nguyen (NOAA/CRWG); Jamileh Soueidan (CRC/CRWG	a. TBD - two regional focus areas (one in MD and one in VA)		

		studies into consolidated guidance to help practitioners with siting and/or designing natural infrastructure projects (e.g., living shorelines, tidal wetlands). c. Provide advisory support and summarize lessons learned on the grant application process for projects identified through the CRWG's GIT-funded Marsh Adaptation Project (see action 2.2a).	staffer); Jackie Specht (TNC/CRWG) Support: John Wolf (USGS/CBP GIS Team); Land Use WG member?; Wetland WG member?; c. ???			
Management Approach 2: Undertake public and stakeholder engagement to increase understanding of climate change impacts to inform and support adaptation						
2.3	Coordinate with the CBP Strategic Engagement Team to help connect the CRWG science support activities with community resiliency needs	a. Invite representatives from the Local Government Advisory Committee to present on recommendations from the Local Government Forum: Integrating Resilience into Local Planning. b. Review recommendations from the FY20 GIT-funded project, "Chesapeake Bay Program Social Science Assessment and Integration Road Map Development" and determine any follow-up actions.	a. CRWG: Jamileh Soueidan (CRC/CRWG staffer); LGAC: Jennifer Starr (Alliance for the Chesapeake Bay) b. POC: Amy Hayden (UMCES); CRWG member?; STAR staffer?			

Management Approach 3: Address the institutional capacity of the Chesapeake Bay Program to prepare for and respond to climate change						
2.4	Consult on cross-GIT climate change projects	a. Placeholder: Forestry Workgroup climate adaptation-related FY22 GIT-Funded project b. Placeholder: Stream Health Workgroup climate resilience-related FY22 GIT-Funded project c. Placeholder: SAV Workgroup climate resilience-related FY22 GIT-Funded project	a. POC: Katie Brownson (USFS/Forestry Workgroup/CRWG) b. POC: Alison Santoro (Stream Health Workgroup) c. POC: Brook Landry (MDNR/SAV Workgroup)			
2.5	Utilize the Chesapeake Bay Program's SRS process to conduct a biennial review of the Climate Resiliency Workgroup and assess priorities	a. Develop a workgroup charter that describes the workgroup's role, membership contributions, participation benefits, and operating principles – how best the workgroup can support climate resilience outcomes and other workgroup outcomes within the watershed and member organizations. Include an approach to prioritize climate-related requests from the CBP workgroups for CRWG assistance. b. SRS Support – Develop Climate Resiliency Workgroup logic and action table and update management strategies and appendix of partnership climate resilience efforts. Supports action	Julie Reichert-Nguyen (NOAA/CRWG), Jamileh Soueidan (CRC/CRWG Staffer), Mark Bennett (USGS/CRWG), Jackie Specht (TNC/CRWG), Alex Gunnerson and Amy Goldfischer (CRC/STAR staffers), Breck Sullivan (USGS/STAR), Peter Tango (USGS/STAR)			

		in the Executive Council Climate Change Directive Workplan. c. Document high priority science needs to disseminate among groups in the Chesapeake Bay Program Science Needs database. d. Determine how the workgroup can support science recommendations from the Rising Water Temperature STAC workshop. e. Evaluate workgroup's role in supporting ocean acidification and blue carbon/carbon sequestration monitoring and assessment needs, in coordination with STAR (refer to Enhancing the Chesapeake Bay Program Monitoring Networks report to the PSC) .				
2.6	CRWG membership, meetings, and website	a. Distribute survey to workgroup members to understand their climate related interests and expertise to identify opportunities and gaps in membership to support the Monitoring and Assessment and Adaptation Outcomes and cross-	Julie Reichert-Nguyen (NOAA/CRWG), Jamileh Soueidan (CRWG Staffer), Mark Bennett (USGS/CRWG), Jackie Specht (TNC/CRWG), Alex			

		workgroup climate-related projects. b. Seek to expand workgroup membership to support activities and align with resiliency funding opportunities. c. Organize and facilitate CRWG meetings. Work with members to identify the best structure for meetings to effectively make progress on CRWG actions. d. Host meetings to identify and discuss gaps in resiliency work (e.g., ghost forests/forest loss, marsh migration tradeoffs, benefits of living shorelines versus hardened shorelines, equitable adaptation) in collaboration with respective workgroups. e. Update Climate Resiliency Workgroup's website	Gunnerson and Amy Goldfischer (STAR staffers)			
2.7	Prepare for new federal and state climate initiatives and emerging issues related to the Chesapeake Bay	a. Federal Office Directors (FOD) communicate with CRWG on new administration climate policy and direction. b. Develop process to document emerging climate change issues	a. FOD: Lee McDonnell (U.S. EPA), Mark Bennett (USGS), and Sean Corson (NOAA)			

	climate resilience needs	provided by FOD and state partners. c. Review and coordinate with respective groups on the Comprehensive Evaluation of System Response (CESR) STAC report in connection with nearshore and climate resilience efforts.	b. Mark Bennett (USGS/CRWG), Julie Reichert-Nguyen (NOAA/CRWG), Jamileh Soueidan (CRC/CRWG staffer) c. Julie Reichert-Nguyen (NOAA), Bruce Vogt (NOAA), Jamileh Soueidan (CRC); CRWG member?; STAR Staffer?			