

Biennial Strategy Review System: Logic Table and Work Plan

Instructions: The following Logic Table should be used to articulate, document, and examine the reasoning behind your work toward an Outcome. Your reasoning—or logic—should be based on the Partnership’s adaptive management [decision framework](#). This table allows you to indicate the status of your management actions and denote which actions have or will play the biggest role in making progress.

Some Management Strategies and Work Plans will not immediately or easily fit into this analytical format. However, **all GITs should complete columns one through four** to bring consistency to and heighten the utility of these guiding documents. The remaining columns are recommended for those who are able to complete them. If you have any questions as you are completing this table, please contact SRS Team Coordinator Laura Free (free.laura@epa.gov).

The instructions below should be used to complete the table. An example table is available on the [GIT 6 webpage](#) under “Projects and Resources”.

1. For the first round of strategic review (2017-2018): Use your existing Work Plan actions to complete the **Work Plan Actions** section first. Make sure to number each of the actions under a high-level Management Approach, as these numbers will provide a link between the work plan and the logic table above it. Use color to indicate the status of your actions: a **green** row indicates an action has been completed or is moving forward as planned; a **yellow** row indicates an action has encountered minor obstacles; and a **red** row indicates an action has not been taken or has encountered a serious barrier.
2. **Required:** In the column labeled **Factor**, list the significant factors (both positive and negative) that will or could affect your progress toward an Outcome. The most effective method to ensure logic flow is to list all your factors and then complete each row for each factor. Consult our Guide to Influencing Factors (Appendix B of the Quarterly Progress Meeting Guide on the [GIT 6 webpage](#) under “Projects and Resources”) to ensure your list is reasonably comprehensive and has considered human and natural systems. Include any factors that were not mentioned in your original Management Strategy or Work Plan but should be addressed in any revised course of action. If an unmanageable factor significantly impacts your outcome (e.g., climate change), you might choose to list it here and describe how you are tracking (but not managing) that factor.
3. **Required:** In the column labeled **Current Efforts**, use keywords to describe existing programs or current efforts that other organizations are taking that happen to support your work to manage an influencing factor but would take place even without the influence or coordination of the Chesapeake Bay Program. You may also include current efforts by the Chesapeake Bay Program. Many of these current efforts may already be identified in your Management Strategy; you may choose to link the keywords used in this table to your Management Strategy document for additional context. You may also choose to include some of these efforts as actions in your work plan; if you do, please include the action’s number and hyperlink.
4. **Required:** In the column labeled **Gap**, list any existing gap(s) left by those programs that may already be in place to address an influencing factor. These gaps should help determine the actions that should be taken by the Chesapeake Bay Program through the collective efforts of Goal Implementation Teams, Workgroups, and internal support teams like STAR, or the actions that should be taken by individual partners to support our collective work (e.g., a presentation of scientific findings by a federal agency to a Chesapeake Bay Program workgroup). These gaps may already be listed in your Management Strategy.
5. **Required:** In the column labeled **Actions**, list the number that corresponds to the action(s) you are taking to fill identified gaps in managing influencing factors. Include on a separate line those approaches and/or actions that may not be linked to an influencing factor. To help identify the action number, you may also include a few key words. Emphasize critical actions in **bold**.
6. **Optional:** In the column labeled **Metric**, describe any metric(s) or observation(s) that will be used to determine whether your management actions have achieved the intended result.
7. **Optional:** In the column labeled **Expected Response and Application**, briefly describe the expected effects and future application of your management actions. Include the timing and magnitude of any expected changes, whether these changes have occurred, and how these changes will influence your next steps
8. **Optional:** In the column labeled **Learn/Adapt**, describe what you learned from taking an action and how this lesson will impact your work plan or Management Strategy going forward.

Climate Resiliency Logic Table and Work Plan (Monitoring & Assessment and Adaptation)

Primary Users: Goal Implementation Teams, Workgroups, and Management Board | **Secondary Audience:** Interested Internal or External Parties

Primary Purpose: To assist partners in thinking through the relationships between their actions and specific factors, existing programs and gaps (either new or identified in their Management Strategies) and to help workgroups and Goal Implementation Teams prepare to present significant findings related to these actions and/or factors, existing programs and gaps to the Management Board. | **Secondary Purpose:** To enable those who are not familiar with a workgroup to understand and trace the logic driving its actions.

Reminder: As you complete the table below, keep in mind that removing actions, adapting actions, or adding new actions may require you to adjust the high-level Management Approaches outlined in your Management Strategy (to ensure these approaches continue to represent the collection of actions below them).

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

Two-year Target: (increment of metric for success):

KEY: Use the following colors to indicate whether a Metric and Expected Response have been identified.

Metric	Specific metrics have not been identified
	Metrics have been identified
Expected Response	No timeline for progress for this action has been specified
	Timeline has been specified

Factor	Current Efforts	Gap	Actions (critical in bold)	Metrics	Expected Response and Application	Learn/Adapt
<i>What is impacting our ability to achieve our outcome?</i>	<i>What current efforts are addressing this factor?</i>	<i>What further efforts or information are needed to fully address this factor?</i>	<i>What actions are essential to achieve our outcome?</i>	<i>Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?</i>	<i>Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?</i>	<i>Optional: What did we learn from taking this action? How will this lesson impact our work?</i>
Example:						
Partner Coordination: Development of shared stream restoration	4.4 (Example purposes only)	Lack of common watershed, stressor, and stream assessment	2.1			

<i>monitoring protocols and technical guidelines</i>		<i>and restoration guidelines</i>				
Scientific and Technical Understanding of Credit-oriented Protocols: <i>BMP implementation effect on potential lift and/or improvement in stream function</i>	<i>Various groups are implementing BMPs in streams. See Management Strategy for details.</i>	<i>Robust stream restoration monitoring</i>	<u>1.4</u>			
Outcome: Monitoring and Assessment						
Scientific Capabilities. The scientific capabilities to estimate, project, model and monitor ecosystem changes and impacts as a result of climate change are just emerging. Appropriate and accurate science and modeling are necessary for Chesapeake Bay Program partners to properly address climate impacts during policy planning and adaptation efforts.		To fully understand the potential changes and anticipated impacts, the Chesapeake Bay Program and its partners must define the science and data needs at appropriate scales for the Chesapeake Bay. Data availability and accessibility at multiple scales is necessary, as is a better understanding of the methods, models and tools required to assess impacts, vulnerabilities, adaptation and management priorities.				
Variability of 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 comparability among regions and sectors. The variability of ecosystems and ecosystem processes will also require different science and						

adaptation approaches.						
<p>Complexity of the Monitoring Program. Developing 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.</p>						
<p>Non-climate Related and Multiple Stressors. Overall, climate change impacts are particularly difficult to monitor and assess because they can be exacerbated by existing non-climate or human-induced stressors such as regional or localized land-subsidence, land use change, growth and development. It is often difficult to differentiate climate impacts from the impacts of other stressors. An increased understanding of these interactions is necessary to successfully assess climate impacts, and the effectiveness of restoration and protection policies, programs and projects.</p>						
Outcome: Adaptation						
<p>Stakeholder engagement. Although there is acknowledgement that climate change and adaptation need to be addressed, there is a lack of understanding or agreement from stakeholders on what it means to be resilient or what constitutes resiliency, including what kind of</p>						

<p>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. If social stability is reduced, then policy effectiveness would likely be reduced.</p>						
<p>Lack of Capacity. Institutions and the private sector have a general lack of capacity to understand the science and incorporate meaningful change into plans, programs, processes or projects. Although building that capacity is paramount, it can be time consuming and costly, considering the resource constraints faced by governments and organizations.</p>						
<p>Lack of Authority. Governments' and institutions' ability to respond to climate change is also limited by legislative, policy, regulatory and other authorities.</p>						
<p>Lack of Guidance. There is currently a lack of clear science (models, tools and metrics) and guidance for the Chesapeake Bay Program, as well as stakeholders, to use to develop plans or to measure efficacy of response. The nature of on-the-ground implementation often requires certainties (e.g., hydrology, water quality, temperature,</p>						

precipitation, sea level rise, coastal erosion rates) that are not yet available for a changing climate.						
lack of 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 leverage resources and provide consistent approaches across the watershed.						
Variable approaches. There is variability in institutional responses and the capacity to respond.						

MONITORING & ASSESSMENT WORK PLAN ACTIONS					
<p>Green - action has been completed or is moving forward as planned Yellow - action has encountered minor obstacles</p> <p>Red - action has not been taken or has encountered a serious barrier</p>					
Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline
Management Approach 1: Define Goals and Establish Baselines; Develop Conceptual Monitoring, Modeling and Assessment Model; and Prioritize Climate Impacts					
	No current actions for this management approach at this time				
1.1	Develop and implement a methodology to establish climate related goals and baselines for individual Chesapeake Bay Agreement Management Strategies.	Complete a Literature Review of existing ecosystem-based climate resiliency approaches, aids (e.g., tables, matrices) and processes or decision making products.	CRWG	Watershed	Complete.
		Compile existing climate change vulnerability research and data, including available assessment products and tools, specific to SAV and tidal wetlands/Black Duck,	CRWG	Watershed	Complete.

		within the Chesapeake Bay region.			
		Create a Climate Resiliency Analysis and Decision Making Matrix to enable the assessment of climate impacts on existing management goals and outcomes and the effect of climate change on the performance of specific management practices (BMPs).	CRWG	Watershed	Complete.
		Conduct a review of approach to factor climate change considerations into the 2017 Chesapeake Bay TMDL Midpoint Assessment	CRWG, STAC, WQGIT, Modeling WG	Watershed	Complete.
Management Approach 2: Design Monitoring and Modeling Plan					
	Consider next steps from the 2018 STAC Climate Change Modeling 2.0 workshop in conjunction with the Water Quality GIT		CRWG, Modeling Workgroup	Watershed	Thematic area: Effects on BMPs
2.1	Identify and evaluate the continuity of existing monitoring data and models within federal agencies, state partners, and academic partners, to explain climate factors of interest to the Bay Program Partnership (i.e., sea level rise, precipitation, temp) at the watershed scale.	Conduct STAC Workshops on: 1) Climate Forecasts and Projections for CB Assessments; and 2) Aligning Chesapeake Bay Program Monitoring Efforts to Support Climate Change Impact and Trend Analyses and Adaptive Management.	CRWG, STAC	Watershed	Complete.
2.2	Catalogue monitoring and modeling gaps for 4 select Chesapeake Bay Agreement Management Strategies	Work with 4 select Workgroups to determine current and future monitoring needs by geography, habitat type, and BMP and outline gaps at Workgroup or GIT level.	CRWG, STAR, CBP Workgroups	Watershed	Complete.
		Outline gaps for watershed scale monitoring effort, including gaps related to monitoring of non-climate stressors that could exacerbate climate impacts to Chesapeake Bay habitat or BMPs.	CRWG, STAR	Watershed	Complete.

2.3	Identify gap-filling solutions by expanding the Partnership to include identified ongoing or planned monitoring efforts of climate factors.	Identify opportunities to better integrate data collected by the NOAA Chesapeake Bay Sentinel Site Cooperative (CBSSC) with CBP monitoring efforts.	CRWG, NCBO, CBSSC	Watershed	This could potentially be an action given the Marsh summit the Chesapeake Bay Sentinel Site is holding in February 2019
2.4	Develop a plan to fill identified gaps.	Explore the use of citizen-based monitoring networks. Identify costs associated with closing monitoring gaps. Identify agencies/organizations through which commitments could be sought to fund or participate in filling monitoring gaps. Identify geographical overlap in monitoring and modeling efforts to explore opportunities for cost saving efficiencies and integration of priorities to include climate factors.	CRWG, STAR CRWG, STAR CRWG, STAR	Watershed Watershed Watershed	
Management Approach 3: Assess past and future trends in sea level, precipitation patterns, temperature and ecosystem response					
	No current actions for this management approach at this time				
3.1	Establish guidance of the application of climate change scenarios, projections and realizations for Chesapeake Bay Program assessments.	Facilitate a workshop to evaluate applicability of international, national, regional and state climate scenarios, projections, forecasts and assessments and to develop process for establishing a recommended set of climate projections for use in Chesapeake Bay Program assessments. Convene a group of sea level rise researchers and resource experts to reach agreement on sea level rise estimates to apply to MPA modeling efforts; how to	CRWG, STAC CRWG, CBSSC	Watershed Watershed	Complete. Complete.

		best approach simulating effects of sea level rise on living resources and wetlands; and the range of sea level rise scenarios to run.			
3.2	Conduct a literature review and synthesis of latest scientific research on past and future climate change impacts on the Chesapeake Bay, as was done in the 2008 Scientific and Technical Advisory Committee report.	Assess international, national, regional and state-level (DE, MD, PA, WV, VA, NY, DC) climate change assessments.	CRWG, STAC	Watershed	Complete.
		Synthesize latest scientific research on sea level and water level trends; precipitation and evapotranspiration; and temperature change in both air and water	CRWG, STAC	Watershed	Complete.
3.3	Gain a better understanding of past and future impact of ocean acidification on Chesapeake Bay waters.	Convene federal, state and regional experts along with academic partners to assess current knowledge surrounding ocean acidification trends within the Chesapeake Bay.	CRWG, MACAN, NCBO	Watershed	
Management Approach 4: Develop a research agenda to improve understanding of climate impacts or fill critical data or research gaps					
	Develop prioritized list of Climate Science research needs for the Chesapeake Bay Program in conjunction with STAC (to inform their science synthesis)		CRWG, STAC	Watershed	
4.2	Compile a research agenda to improve understanding of climate impacts or fill critical data or research gaps.	Conduct a cursory review and analysis of 29 individual management strategies to initial climate-related research needs.	CRWG, CBP Workgroups	Watershed	Complete.
		Conduct an assessment of research needs to support future policy dialog related to the integration of climate change considerations into the Water Quality Management Strategy.	CRWG, WQGIF	Watershed	Complete.
		Work with regional partners (e.g., LCC, Climate Hubs and Climate Science Centers), academic institutions and other stakeholders to collaboratively define climate related science and research needs at the broader watershed scale or within a defined geographic area.	CRWG, LCC, Climate Hubs and Climate Science Centers	Watershed	Relates to Climate Research needs that we are

					working on with STAC (see above)
4.2	Undertake targeted research to improve understanding of climate impacts or fill critical data or research gaps.	No collective action identified.	CRWG	Watershed	
4.3	Compile available data, tools and resources that can be used to support Chesapeake Bay watershed vulnerability assessments.	No collective action identified.	CRWG	Watershed	
Management Approach 5: Undertake public, stakeholder and local engagement					
	No current actions for this management approach at this time				
5.1	Increase availability and access to monitoring and assessment data.	No collective action identified.	CRWG	Watershed	Relates to Chesapeake Data and mapping repository?
Management Approach 6: Review progress and reassess implementation priorities					
	No current actions for this management approach at this time				
6.1	Review progress on a biennial basis.	Evaluate progress toward the closing of gaps in baseline monitoring and gaps in assessment tools and scientific research.	CRWG	Watershed	

ADAPTATION WORK PLAN ACTIONS

Green - action has been completed or is moving forward as planned Yellow - action has encountered minor obstacles

Red - action has not been taken or has encountered a serious barrier

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.						
	Update Compiled research and resources developed in 2016 (Appendix B)		CRWG	Watershed		
	Develop and refine outreach and communication on co-benefits of climate resiliency		CRWG	Watershed		
1.1	Compile and assess lessons learned from past and ongoing adaptation	Develop need and format for information to be gathered and a methodology for updating list and synthesis on a continual basis.	CRWG	Watershed	Complete.	
	planning and programmatic efforts within the Chesapeake Bay Watershed.	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	Apply Climate-Smart framework in coordination with two new/additional Chesapeake Bay Program workgroups or GITs		CRWG, other GITs and workgroups	Watershed		
2.2	Revisit and assess Climate-Smart framework application to Black Duck, Tidal Wetlands, SAV and Toxics workgroups		CRWG, Black Duck, Tidal Wetlands, SAV and Toxics workgroups	Watershed		
2.3	Develop and support critical citizen science		CRWG, other GITs and	Watershed		Thematic areas:

	programs that integrate climate resiliency in stream monitoring and restoration		workgroups			stream health
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. (CONSIDER REVISING)						
	Conduct social marketing assessment to understand barriers to implementing living shorelines in MD, DE, and VA (GIT funding) in conjunction with the Communications workgroup		CRWG, Communicatio nworkgroups	Watershed		Theme areas: shoreline condition
	Convene meeting of practitioners to share examples of climate adaptation measures for urban/inland flooding (stormwater BMPs)		CRWG	Watershed		Thematic areas: effects on BMPS, inland flooding
	Provide guidance to jurisdictions on		CRWG, WQGT	Watershed		

	incorporating climate change (via climate change narrative or additional measures) into Phase 3 WIPs in conjunction with the Water Quality GIT					
	Promote the use of the new Climate Data and Mapping Portal		CRWG	Watershed		
	Convene a subset of Climate Resiliency Workgroup meetings as topic specific/"themed" meetings to allow for information sharing with groups doing similar work and improve cross goal coordination		CRWG	Watershed		
3.1	Increase opportunities for formal and informal communication and the exchange of ideas among the Chesapeake Bay watershed's "adaptation planning network."	Work with partners to host a "Chesapeake Bay Climate Adaptation Workshop" or offer adaptation related trainings at appropriate regional forums and conferences.	CRWG	Watershed	relates to both the suggestion to have themed meetings and the suggestion to conduct a regional adaptation meeting in conjunction with Antioch University	

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						
	No current actions for this management approach at this time					
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						
	Continue providing quarterly newsletters on climate resiliency news, opportunities, and 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, communication workgroup	Watershed	ongoing	

	Evaluate the feasibility of co-hosting a Chesapeake Regional adaptation conference in conjunction with Antioch University's annual conference		CRWG, Antioch University	Watershed		
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	
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???	NEED AN UPDATE ON THIS ACTIVITY AND WHO IS ENGAGED IF IT IS

					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						
	Pursue priority recommendations from STAC workshop on BMP siting and design (2017) in conjunction with the Water Quality GIT	<ol style="list-style-type: none"> 1. Develop design guidance to increase BMP resilience 2. Develop monitoring protocols and parameters 3. Advance programmatic practices, legal and regulatory tools 4. Improve communication and outreach to end-users 	CRWG	Watershed		Thematic area: effects on BMPs
	Promote Climate Indicators and pursue development of additional indicators		CRWG	Watershed		
	Pursue development of implementation indicators(s) to track jurisdictions' actions that promote climate resilience (GIT funding)		CRWG	Watershed		
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		
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	