

**Chesapeake Bay TMDL 2017 Midpoint Assessment**  
**Policy Options and Implementation Considerations for Addressing Climate Change in**  
**Jurisdictions' Phase III Watershed Implementation Plans**

CBP Climate Resiliency Workgroup  
WQGIT Briefing Document  
09.06.17

**Background:**

Informed by the outcomes of the Midpoint Assessment's climate change modeling assessment, the Chesapeake Bay Program (CBP) Partnership is scheduled to decide by October 2017 when and how to incorporate climate change considerations into the jurisdictions'<sup>1</sup> Phase III Watershed Implementation Plans (WIPs). To inform this process, the CBP Climate Resiliency Workgroup (CRWG) was tasked with informing the climate change projections and scenarios for input into the watershed and estuarine modeling efforts; exploring both quantitative and qualitative policy options for addressing climate change in the Phase III WIPs; and, developing policy implementation guidance for the Partnership's consideration. During the fall of 2016, the CRWG responded with a set of recommended Guiding Principles, a comprehensive set of policy options, and implementation guidance to the Partnership.

On December 13, 2016, the CBP Partnership Principals' Staff Committee (PSC) approved the [proposed climate change assessment procedures](#) for determining the projected mid-term (2025) and long-term (2050) impacts on the Chesapeake Bay watershed loads and the Chesapeake Bay water quality; and, the set of Guiding Principles as recommended by the Management Board. The PSC did not reach a decision on how and when to incorporate climate change considerations into the Phase III WIPs but instead agreed to continue to work together between now and the next PSC retreat (October 30-31, 2017) to evaluate how the "Quantitative Policy Option" (#2)<sup>2</sup> will play out based on additional modeling results as they become available. Additionally, the PSC agreed to consider language proposed by the Chesapeake Bay Commission (CBC) to combine the proposed "Qualitative Policy Options" (#5-7).<sup>3</sup>

Since the decisions issued by the PSC in December, 2016, the CRWG has continued to support the modeling component of the Midpoint Assessment and to further consideration of the proposed policy options, including the drafting of proposed revisions<sup>4</sup> to the language offered by the CBC and the development of additional implementation guidance for consideration by the Partnership.

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<sup>1</sup> Jurisdictions include the six Bay Watershed states (NY, PA, MD, DE, WV, VA) and the District of Columbia.

<sup>2</sup> *Quantitative Option #2 (as proposed by CRWG): Factor Climate Change into Phase III WIPs Base Conditions:* Use the 2025 climate projection scenarios as base conditions (informed by CBWM climate modeling results) in the establishment of the jurisdictions' Phase III WIPs. The climate change projection would be an added load that the jurisdictions would need to address in addition to their Phase III WIP planning targets, thereby increasing the level of effort.

<sup>3</sup> *Qualitative Options #5-7 (as proposed by CBC: Adaptively Manage Phase III WIPs BMP Implementation):* During each two-year milestone development period, jurisdictions would consider new information on the performance of BMPs and the programs that support them, including the contribution of seasonal, inter-annual climate variability and weather extremes on BMP performance. When there is a detectable impact on the effectiveness of a BMP or programmatic performance, jurisdictions would use this information to re-prioritize their actions to implement in the Phase III WIPs that will better mitigate the anticipated increased in nitrogen, phosphorus or sediment.

## **The Issue(s):**

How to incorporate climate change considerations into Phase III WIPs.

## **Important Timelines and Process Steps to consider:**

- October 30-31, 2017: The PSC is scheduled to decide on how to incorporate climate change considerations into the jurisdictions' Phase III WIPs. Leading up to this, on:
  - September 11, 2017: The CRWG will present its proposed policy options and implementation guidance to the Water Quality Goal Implementation Team (WQGIT).
  - Sept. 19, 2017: The Modeling Workgroup will present its latest climate change modeling results; and
  - Sept. 25-26: The full WQGIT will consider both the modeling results and policy options at its Sept. 25-26 in-person meeting.

## **Decisions:**

The key decision the Partnership is requested to make is whether to include both “Quantitative” and “Qualitative” policies for the incorporation of climate change considerations in the Phase III WIPs. The specific decision points are outlined below:

### **Decision Point #1: Approve policy approach to guide Jurisdictions' development and implementation of Phase III Watershed Implementation Plans**

*Quantitative Component (approved for consideration by PSC) - Factor Climate Change into Phase III WIP' Base Conditions:* Use the 2025 climate projection scenarios as base conditions (informed by CBWM climate modeling results) in the establishment of the jurisdictions' Phase III WIPs. The climate change projection would be an added load that the jurisdictions would need to address in addition to their Phase III WIP planning targets, thereby increasing the level of effort.

*Implementation Considerations:* The climate change projection would be an added load that jurisdictions would need to address in addition to their Phase III WIP planning targets, thereby potentially increasing the level of effort. Addressing climate change as part of the base conditions does not change the assimilative capacity of the Bay, nor the Phase III WIP planning targets. The Partnership will have modeling output results based on a subset of 2025 and 2050 climate scenarios, but there will be uncertainty. Projections of climate and BMP response will likely change over time. Jurisdictions would assess this information and adjust plans in accordance with Chesapeake Bay TMDL, Section 10: Implementation and Adaptive Management. To offset anticipated changes in loads due to climate change, a greater level of effort (i.e., BMP implementation) may be needed to meet water quality standards. Jurisdictions would include a narrative describing these decisions in their Phase III WIPs.

*Qualitative Component (proposed for consideration by CBC) - Adaptively Manage Phase III WIP BMP Implementation:* During each two-year milestone development period, jurisdictions would consider new information on the performance of BMPs and the programs that support them, including the contribution of seasonal, inter-annual climate variability and weather extremes on BMP performance. When there is a detectable impact on the effectiveness of a BMP or programmatic performance, jurisdictions would use this information to adjust and/or re-

prioritize their actions to implement in the Phase III WIPs that will better mitigate the anticipated increases in nitrogen, phosphorus or sediment.

*Implementation Considerations:* The CRWG reviewed the policy option language proposed by the CBC and determined that it does not fully encompass the intent of the 3 policy options (#5,6 and 7) as originally proposed. Elements associated with optimizing BMPs and requesting jurisdictions to provide a narrative statement addressing their programmatic climate change commitments were not included. Additionally, after further analysis, the CWRG agreed that the term “detectable impact” was too arbitrary and would need to be further defined. They also agreed that it is not likely that new information on the performance of BMPs will be available within a timeframe to support an assessment in line with each two-year milestone development period. The CRWG has proposed alternative language for Partnership consideration.

*Qualitative Component (proposed for consideration by CRWG)<sup>5</sup> - Optimize Phase III WIP Development and Adaptively Manage BMP Implementation:*

*Element A:* During the development of Phase III WIPs, jurisdictions will consider and prioritize BMPs that are more resilient to future climate impacts over the intended design life of the proposed practices.

*Element B:* Within a practical time-period applicable to an individual source sector, initiative or action, the Partnership will consider new information on the performance of BMPs, including the contribution of seasonal, inter-annual climate variability, and weather extremes. Jurisdictions will assess this information and their support programs and adjust plans through the two-year milestone process to implement their Phase III WIPs to better mitigate anticipated increases in nitrogen, phosphorus, or sediment due to climate change.

*Element C:* Jurisdictions will provide a narrative consistent with the Guiding Principles that describes their programmatic commitments to address climate change in their Phase III WIPs.

*Implementation Considerations:* The CRWG has compiled informational material, including a “Guidance Example” and “Sample Narrative Template,” outlining a potential means and method for implementation of the three elements of the qualitative policy component, as proposed above (See Appendix A). Once the Partnership reaches agreement on the approach to consider climate change in Jurisdictions’ Phase III WIPs, formal implementation guidance will be developed and approved by the CRWG and WQGIT.

## **Decision Point #2: Establish the “minimum standard” for implementation in Jurisdictions’ Phase III WIPs**

*Implementation Considerations:* The Partnership should not consider the “Quantitative” and “Qualitative” policy components as mutually exclusive: instead, they should be viewed as two separate components (quantitative and qualitative), which could be implemented in tandem, or as a stand-alone.

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<sup>5</sup> Upon further consideration by the CRWG, the Workgroup proposed revisions to the language offered for consideration by the CBC, to be more in line with original intent of proposed policy options #5-7.

Therefore, the Partnership could decide to require the inclusion of both the Quantitative and/or the Qualitative Components in Phase III WIPs.

**Decision Point #3: Establish the level of flexibility among jurisdictions, as well as commitments for CBP programmatic support (e.g., guidance, data, funding, etc.), for implementation of climate change policies that exceed the “minimum standards” of Partnership approved quantitative and/or qualitative policy components.**

*Implementation Considerations:* Upon a decision by the Partnership to address climate change qualitatively, flexibility and CBP programmatic support could be provided to specific jurisdictions that may elect to include a quantitative and or expanded qualitative policy component in their Phase III WIPs.

## Appendix A. Guidance Example for Qualitative Policy Component

(Under development by the Climate Resiliency Workgroup and Water Quality Goal Implementation Team)<sup>6</sup>

### ***Qualitative Component: Optimize Phase III WIP Development and Adaptively Manage BMP Implementation***

*Element A.) During the development of the Phase III WIPs, jurisdictions would consider and prioritize BMPs that are more resilient to future climate impacts over the intended design life of the proposed practices.*

Implementation Considerations: Jurisdictions could consider and prioritize BMPs that are more resilient to future climate impacts over the intended design life of the proposed practices, during the development of the Phase III WIPs. Initial information about BMP climate resiliency impacts were included in the TetraTech BMP Impact Score Tool, however additional research will be needed to support full implementation of this option over time. Planned support activities for purposes of providing additional guidance related to this component, include: 1) A compilation of climate change-related BMP implementation reference documents, tools, and resources; and 2) *STAC Workshop: Monitoring and Assessing Impacts of Changes in Weather Patterns and Extreme Events on BMP Siting and Design* (Sept. 7-8 2017). It is envisioned that the STAC Workshop will result in a summary report, outlining the following:

1. What are the general principles of BMP siting and design to reduce the vulnerability of urban, agriculture, and coastal BMPs to future impacts of sea level rise, coastal storms, increased temperature, and extreme events?
2. How flexible or adaptable are BMPs to anticipated changes in weather patterns and extreme events and what types of adjustments (e.g., retrofits) in BMP design are necessary to maintain functionality and/or structural integrity?
3. What suite of BMPs are considered more robust (e.g., mitigate the anticipated increased nitrogen, phosphorus, and sediment loads) to anticipated changes in weather patterns and extreme events?
4. What are the remaining gaps and highest priority needs (i.e., research, monitoring measures, programmatic efforts) to address in order to better inform and improve BMP development and implementation?

*Element B.) Jurisdictions would consider new information on the performance of BMPs and the programs that support them, including the contribution of seasonal, inter-annual climate variability, and weather extremes.*

Implementation Considerations: Within a practical time-period applicable to an individual source sector, initiative, or action, the Partnership would consider new information on the performance of BMPs,

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<sup>6</sup> Appendix A includes informational material compiled by the CRWG, including a "Sample Narrative Template." Appendix A outlines a potential means and method for implementation of the three elements of the CRWG's proposed qualitative policy component. Once the Partnership reaches agreement on the approach to consider climate change in Jurisdictions' Phase III WIPs, formal implementation guidance will be developed and approved by the CRWG and WQGIT.

including the contribution of seasonal, inter-annual climate variability, and weather extremes. Jurisdictions would assess this information, their support programs and adjust plans to better mitigate anticipated increases in nitrogen, phosphorus, or sediment due to climate change. To inform implementation, it is expected that the Partnership would need to work together to facilitate the collection and evaluation of BMP performance data. This will enable the Partnership to learn more about BMP performance and the sensitivity of BMPs that are attributable to climate change, to allow for consideration of these factors while adaptively managing for long-term change. Periodically, in support of this action, the CBP Partnership, through STAC working consultatively with CRWG, could compile and assess the latest climate and ecosystem science, research, or data, and relay this information to the jurisdictions.

*Element C.) Jurisdictions would provide a narrative strategy, consistent with the Guiding Principles, which describes their programmatic and/or numeric (e.g., BMP) commitments to address climate change in their Phase III WIPs.*

Implementation Considerations: The CBP's assessment of the projected impacts and modeling results of climate change in 2025 and 2050 for a range of scenarios would be relayed to the jurisdictions. The jurisdictions would include a narrative strategy in their Phase III WIPs, outlining their programmatic and/or numeric (if Quantitative Component selected) commitments to address projected impacts consistent with the Guiding Principles, outlined below (approved by the PSC on December 13, 2016).<sup>7</sup> Narrative strategies could vary across jurisdictions; however, by following a "narrative template," they could be standardized/harmonized to provide for transparency, accountability, and consistency. EPA could potentially use these elements as a guide to evaluate the proposed narrative strategies in the Phase III WIPs.

Sample Narrative Template:

I. Scientific Assessment and Conclusions

- a) The CBP's assessment of the projected impacts and modeling results of climate change in 2025 and 2050 for a range of scenarios would be relayed to the jurisdictions. In response, jurisdictions should describe method(s) for gathering and assessing additional scientific data and information. This element allows for flexibility in jurisdictions' approaches to addressing climate change, and can incorporate local knowledge and information where quantitative data may be lacking.
- b) Identify conclusions based on scientific assessments.
- c) Address how the scientific conclusions guided their programmatic and/or numeric commitments (if Quantitative Component selected). Jurisdictions should use local expertise and knowledge along with the latest climate information and science to inform their programmatic and/or numeric commitments.

II. Programmatic and/or Numeric Commitments (if Quantitative Component selected)

- a) Outline programmatic and/or numeric (if Quantitative Component selected) commitments to address projected impacts consistent with the Climate Resiliency Guiding Principles. Commitments may vary across jurisdictions but could include activities such as undertaking

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<sup>7</sup> Jurisdictions should also reference Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework; and, Section 10: Implementation and Adaptive Management for guidance on developing narrative strategies.

demonstration projects; prioritizing implementation of climate-resilient BMPs; approaches for assessing vulnerability of planned BMPs; or enhancing plans, policies, regulations or on-the-ground efforts to address impacts, etc. Jurisdictions could also pursue BMPs with clear co-benefits and climate change-related positive impacts (e.g., habitat restoration and flood control).

### III: Phase III WIP Development: Planning and Scoping<sup>8</sup>

a) Describe the process used to guide Phase III WIP development, in accordance with the approved Climate Resiliency Guiding Principles for WIP Development:

1. *Capitalize on “Co-Benefits”* – maximize BMP selection to increase climate or coastal resiliency, soil health, flood attenuation, habitat restoration, carbon sequestration, or socio-economic and quality of life benefits.

2. *Account for and integrate planning and consideration of existing stressors* – consider existing stressors such as future increase in the amount of paved or impervious area, future population growth, and land-use change in establishing reduction targets or selection/prioritizing BMPs.

3. *Align with existing climate resiliency plans and strategies* – align with implementation of existing greenhouse gas reduction strategies; coastal/climate adaptation strategies; hazard mitigation plans; floodplain management programs; fisheries/habitat restoration programs, etc.

4. *Manage for risk and plan for uncertainty* – employ iterative risk management and develop robust and flexible implementation plans to achieve and maintain the established water quality standards in changing, often difficult-to-predict conditions.

5. *Engage Local Agencies and Leaders* – work cooperatively with agencies, elected officials, and staff at the local level to provide the best available data on local impacts from climate change and facilitate the modification of existing WIPs to account for these impacts.

### IV. Phase III WIP Implementation: BMP Evaluation (Qualitative/Quantitative) Process<sup>9</sup>

a) Describe the process used by jurisdictions to implement WIP programmatic and/or numeric commitments, including the qualitative and/or quantitative evaluation and implementation of BMPs, in accordance with the approved Climate Resiliency Guiding Principles: WIP Implementation.

1. *Reduce vulnerability* - use “Climate-Smart” principles to site and design BMP’s to reduce future impact of sea level rise, coastal storms, increased temperature, and extreme events on BMP performance over time. Vulnerability should be evaluated based on the factor of risk (i.e. consequence x probability) in combination with determined levels of risk tolerance, over the intended design-life of the proposed practice.

2. *Build in flexibility and adaptability* - allow for adjustments in BMP implementation in order to consider a wider range of potential uncertainties and a richer set of response options (load allocations, BMP selections, BMP redesign). Use existing WIP development, implementation and reporting procedures, as well as monitoring results and local feedback on performance, to guide this process.

### V. Documentation, Reporting and Adaptive Management

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<sup>8</sup> Additional information and guidance for jurisdictions on how to implement this element will be gathered through the STAC workshop on BMP Siting and Design (Sept. 7-8, 2017).

<sup>9</sup> Additional information and guidance for jurisdictions on how to implement this element will be gathered through the STAC workshop on BMP Siting and Design (Sept. 7-8, 2017).

- a) Establish a timeline for submission of documentation and reporting on all of the above. Reporting should include findings of new or updated scientific assessments and resulting changes to Phase III WIPs, including adjustments to two-year milestones. Documentation, reporting, and adaptive management shall be administered in accordance with Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework<sup>10</sup>; and, Section 10: Implementation and Adaptive Management<sup>11</sup>.
- b) Jurisdictions would identify programmatic and/or numeric efforts and plans to adaptively manage. Jurisdictions should describe processes that will allow for changes in BMP selection or WIP implementation, over-time, as new climate and ecosystem science, research, or data becomes available and the understanding of the impact of how changing seasonal, inter-annual climatic, and weather conditions may affect the performance of watershed restoration practices.

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<sup>10</sup> Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework

<sup>11</sup> Chesapeake Bay TMDL, Section 10: Implementation and Adaptive Management