

# Development of the 2019 CBP Climate Change Assessment: Initial Steps

Modeling Workgroup Quarterly Review  
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Lew Linker, EPA-CBPO and the CBP Modeling Team  
[llinker@chesapekbay.net](mailto:llinker@chesapekbay.net)



**Chesapeake Bay Program**  
*Science, Restoration, Partnership*



Climate change and its influence on the Chesapeake watershed and estuary is a multi-generational, ongoing challenge in the CBP.

- Our first task is the 2019 CBP Climate Change Assessment given to us by the PSC.
- At the same time we need to keep in mind our long-term task of developing a 2025 Next Generation Model to support CBP decision making beyond 2025.
- Going through 2019 to get to 2025 - the need and utility of strategic investments by the Modeling Workgroup for advances in the 2019 model to also support the 2025 effort.



## Development of the 2019 CBP Climate Change Assessment – Drilling Down

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### **Full Documentation of Current 2017 Climate Change Assessment:**

This is a primary 2018 focus of the Modeling Workgroup/CBPO Modeling Team

- Response to STAC Peer Review on climate change assessment:
  - Draft response now being reviewed by Modeling Workgroup
  - Further reviews by the Climate Resiliency Workgroup, and the Water Quality Goal Implementation Team before the response is forwarded to the Management Board to be finalized.
- Complete Phase 6 Watershed Model documentation – May 2018
- Complete 2017 WQSTM documentation – May 2018
- Peer reviewed manuscripts are in preparation.



# Development of the 2019 CBP Climate Change Assessment

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## **Refinements of Phase 6 Inputs and Processes:**

- Full review of model inputs and processes – We’ve had the advantage of being able to sort the various elements of the climate change challenge into “big problems” and “little problems”. For example stomatal resistance is a little problem, but evapotranspiration is a big problem. The Modeling Workgroup will look at all processes and inputs, but will focus on the big problems of precipitation into the system, evapotranspiration, and temperature in the estuary.
- The main focus will be on the difference between the 1991-2000 CBP average hydrology and the 30 year delta to 2025 conditions of temperature and precipitation. However, the incremental periods of 2035, 2045, and 2055 will also be examined to understand the influence of the rates of change among precipitation, temperature, and other influences on key processes.



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## **Refinements of Phase 6 Inputs and Processes:**

- Input, guidance, and review from the Climate Resiliency Workgroup and STAC are crucial resources for this work.
- Inputs of local and regional concern, as directed by the PSC, will also be considered.

### ***PSC Decisions of December 2017***

**Incorporate Climate Change in the Phase III WIPs** - Include a narrative strategy in the Phase III WIPs that describes the jurisdictions current action plans and strategies to address climate change, as well as the jurisdiction-specific nutrient and sediment pollution loadings due to 2025 climate change conditions, while incorporating local priorities and actions to address climate change impacts.





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## Refinements of Phase 6 Inputs and Processes:

- Incorporate new understanding of BMP efficiencies and other Expert Panel and Workshop findings as they as developed.

### ***PSC Decisions of December 2017***

**Understand the Science** - Address the uncertainty by documenting the current understanding of the science and identifying research gaps and needs:

- Develop an estimate of pollutant load changes (N, P and Sediment) due to climate change conditions [so that] starting with the 2022-2023 milestones, [the CBP will] determine how climate change will impact the BMPs included in the WIPs and address these vulnerabilities in the two-year milestones.
- Develop a better understanding of the BMP responses, including new or other emerging BMPs, to climate change conditions.
- In 2021, the Partnership will consider results of updated methods, techniques, and studies and revisit existing estimated loads due to climate change to determine if any updates to those load estimates are needed.
- Jurisdictions will be expected to account for additional nutrient and sediment pollutant loads due to 2025 climate change conditions in a Phase III WIP addendum and/or 2-year milestones beginning in 2022.



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## **2018 Chesapeake Community Research & Modeling Symposium: Advancing observational and modeling research to support Chesapeake Bay management and restoration - June 12-14, 2018 at the Crowne Plaza Annapolis**

### **Modeling of climate change consequences for Phase III Watershed Implementation Plans - Donald F. Boesch**

The consequences of global climate change are already evident in the Chesapeake Bay and watershed and will influence virtually every aspect of the structure and function of the ecosystem in the coming decades...This unconventional [panel] session seeks to increase community awareness of the consequences of climate change and solicit its input toward addressing the particular challenge of adjusting [the Phase 3] WIPs. It will include an overview of the modeling efforts to date, the perspectives of a panel of three scientists familiar with both the climate modeling framework and the decision making process, and facilitated audience participation in the discussion. Outcomes of the session will help shape a subsequent [STAC] workshop and the refinement of analyses.

**Panelists:** Maria Herrmann, Ray Najjar, Zach Easton, and Lee Currey





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## **STAC Workshop:**

### **Chesapeake Bay Program Climate Change Modeling 2.0**

The two-day workshop will bring together experts in climate change, estuarine, and watershed sciences to undertake a detailed and focused examination of the current results of the Chesapeake Bay Program's (CBP) Midpoint Assessment climate change modeling efforts, assess lessons-learned, and recommend next steps. The motivation for the workshop stems from the Principals' Staff Committee decision to develop a framework for addressing climate change impacts in the Phase III Watershed Implementation Plans (WIPs)... in the 2-year milestones beginning in 2022. The goal of the workshop is to develop recommendations for new and/or refined methods and modeling techniques to be completed and fully operational by 2019, in order to assess future impacts of projected climate change on watershed loads and estuarine processes.