

A photograph showing a flooded coastal area. In the foreground, there is a body of water reflecting the sky. In the middle ground, a white, two-story house with a dark roof and a chimney stands on a small patch of land. To the left of the house, a utility pole with power lines is visible. The background shows a line of trees and a clear sky with some clouds. The text "Chesapeake Bay Program STAC Climate Change Workshop" is overlaid in white on the bottom half of the image.

**Chesapeake Bay Program  
STAC  
Climate Change  
Workshop**




DO NOT  
ENTER


Griffins




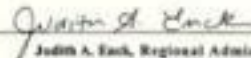
CHESAPEAKE  
WATERSHED  
AGREEMENT



Chesapeake Bay Total Maximum Daily Load  
for Nitrogen, Phosphorus and Sediment  
Established by the U.S. Environmental Protection Agency



  
Shawn M. Garvis, Regional Administrator  
U.S. Environmental Protection Agency  
Region 3

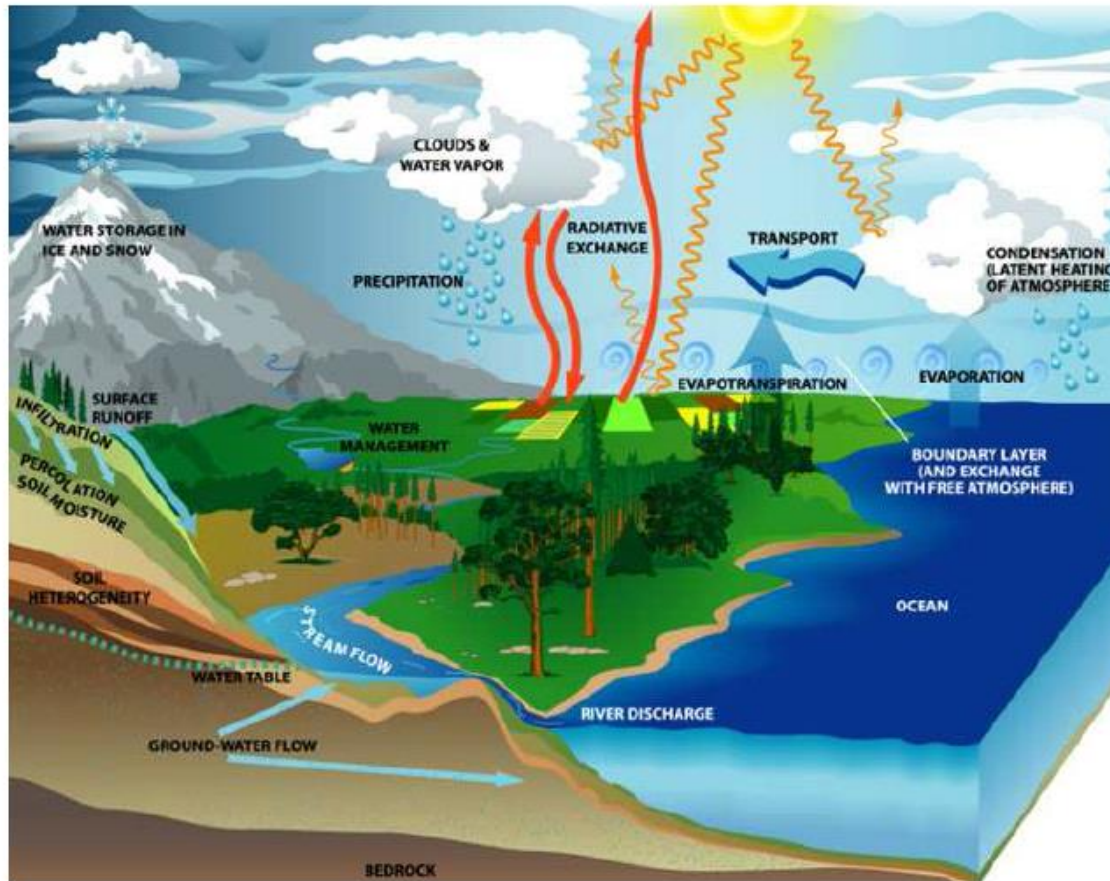
  
Judith A. Each, Regional Administrator  
U.S. Environmental Protection Agency  
Region 2

DATE: 12/29/10

- Sustainable Fisheries
- Vital Habitats
- Water Quality
- Toxic Contaminants
- Healthy Watersheds
- Stewardship
- Land Conservation
- Public Access
- Environmental Literacy
- Climate Resiliency

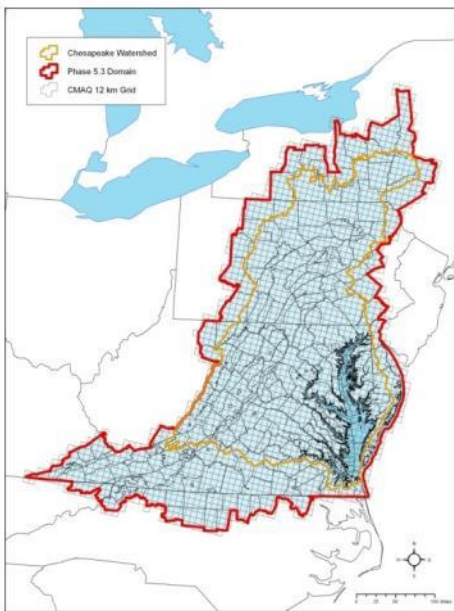
- Sustainable Fisheries
- Vital Habitats
- **Water Quality**
- Toxic Contaminants
- Healthy Watersheds
- Stewardship
- Land Conservation
- Public Access
- Environmental Literacy
- Climate Resiliency

# Quantifying the Direct Expressions of Climate Change...



- Estuarine water temperature
- Sea level rise
- Wetlands inundation
- Wind
- Stratification
- Oxygen saturation
- Solar radiation
- Stream temperature
- Stream flow
- Precipitation
- Evapotranspiration
- Surface runoff
- Infiltration
- Groundwater flow
- Snow pack
- ...and the list continues

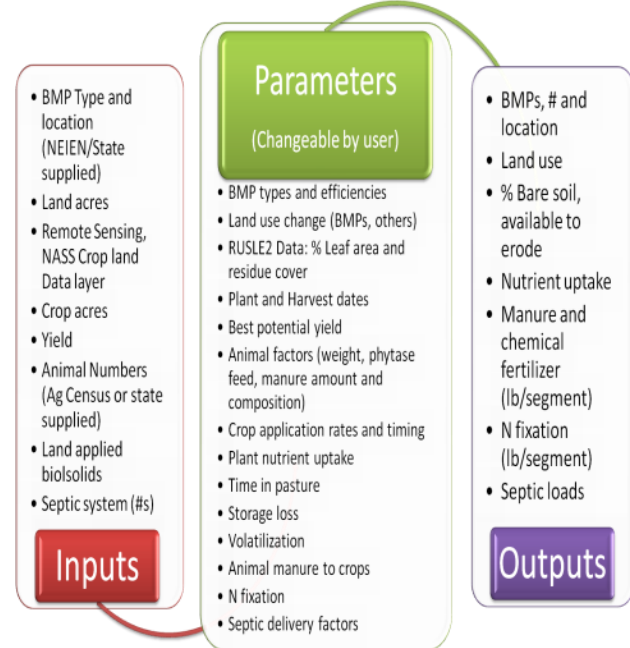
...in terms of the Resultant Changes to Watershed/Estuarine Processes, Habitats and Resources



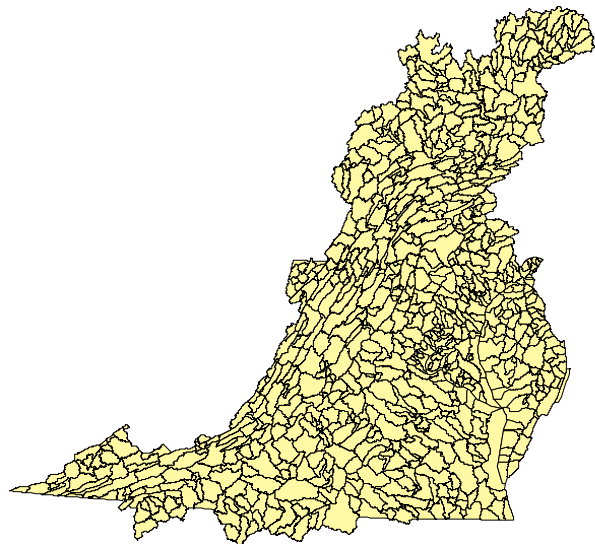
**Chesapeake Bay Airshed Model**



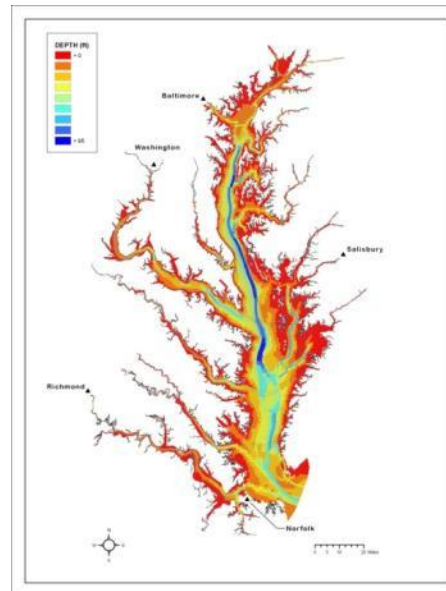
**Chesapeake Bay Land Change Model**



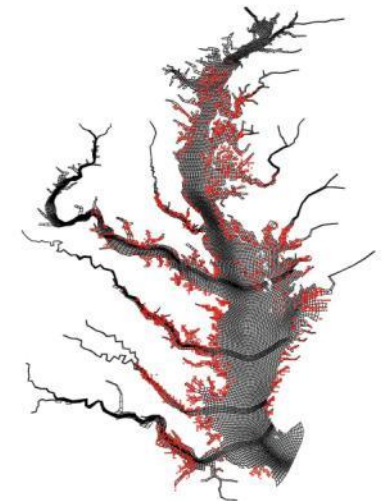
**Chesapeake Bay Scenario Builder**



**Chesapeake Bay Watershed Model**



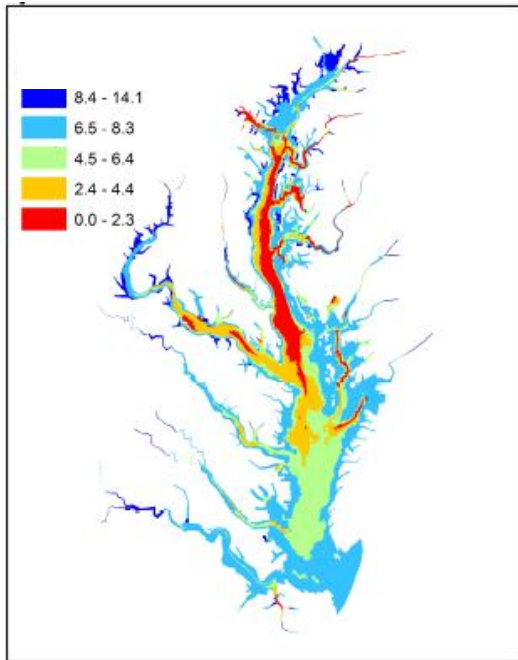
**Chesapeake Bay Water Quality and Sediment Transport Model**



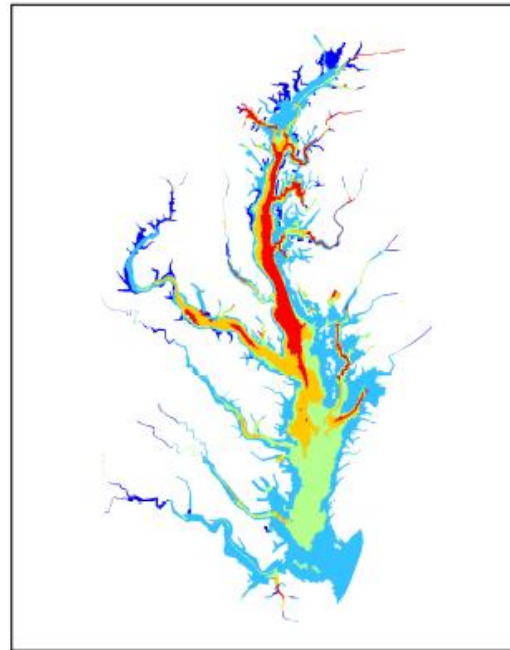
**Chesapeake Bay Filter Feeder Model**

# 2050 Estimated Temperature Increase and Deep Channel Dissolved Oxygen Decrease

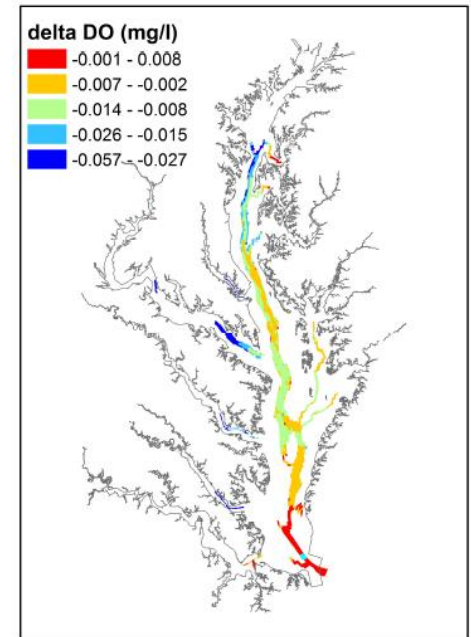
Current Temperatures



2050 Estimated Temperatures



Changes in Deep Channel Dissolved Oxygen



# During Each Presentation, Ask

- How does what they are presenting inform what we need to build into an overall climate change assessment framework for use by the Partnership?
  - Variables of most concern, key characteristics
  - GCMs, downscaling, use of historical observations
  - Selection of climate change scenarios
  - Management application of the framework

- Sustainable Fisheries
- Vital Habitats
- Water Quality
- Toxic Contaminants
- Healthy Watersheds
- Stewardship
- Land Conservation
- Public Access
- Environmental Literacy
- Climate Resiliency

- Sustainable Fisheries
- Vital Habitats
- **Water Quality**
- Toxic Contaminants
- Healthy Watersheds
- Stewardship
- Land Conservation
- Public Access
- Environmental Literacy
- Climate Resiliency

# Constraints We Must Work With

- 2025 scenario for short range climate change planning and adaptation
- Future scenario, like 2050, to set the far edge of the planning horizon
- Scenario approach delivered within the next 6 months using the models and other assessment tools at hand

2000 Gal  
**YESTERDAY'S MEALS**  
on  
**WHEELS**

CG-27389

Glendale  
Welding Co.

(623) 937-7414

Glendale  
Welding Co.

(623) 937-7414

# Questions?



**Rich Batiuk**

**Associate Director for Science, Analysis  
and Implementation**

**U.S. EPA Chesapeake Bay Program Office**

**410-267-5731**

**[batiuk.richard@epa.gov](mailto:batiuk.richard@epa.gov)**

**[www.chesapeakebay.net](http://www.chesapeakebay.net)**