

Cross-Workgroup Climate Indicator Discussion

Climate Resiliency Workgroup Meeting January 27, 2020

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Meeting Goals

- Connect the climate indicator work to the goals and outcomes and indicator work under healthy watersheds, fish, submerged aquatic vegetation (SAV), wetlands, and forests.
- Strategize which new climate indicators to focus development on to aid workgroups in tracking climate resilience.

Chesapeake Bay Watershed Agreement

II. Goal, Outcomes and Baseline

This management strategy identifies approaches for achieving the following goal and outcomes:



Climate Resiliency Goal

Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.

Monitoring and Assessment Outcome

Continually monitor and assess the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs and projects.

Adaptation Outcome

Continually pursue, design and construct restoration and protection projects to enhance the resiliency of Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms and sea level rise.

Climate Resiliency Work Plan Actions

Action #	Description	Performance Target
1.1	Design, implement, and maintain existing climate indicators and datasets	Continue to evaluate data to develop future climate change indicators including, but not limited to, fish population distribution, bay water temperature, tree canopy
4.3	Convene subset of topic specific meetings to allow information sharing and improve cross goal coordination	Themes may include climate adaptation measures of stormwater BMPs, addressing sea level rise impacts, resiliency, shoreline condition and response; inland and urban flooding; as well as stream health and condition

Proposed Climate Indicator Framework

Physical Indicators
(Signals of Change)



Impact Indicators
(Ecological and Community Threats)



Resilience Indicators
(Readiness)

Example:

Change in Bay Water
Temperature



Decrease in Striped Bass Numbers



Area of Forested
Shoreline (Shading)
in Vulnerable Critical
Striped Bass Habitat
Areas



Climate Resiliency Workgroup: Indicator status update

Breck Sullivan & Cuiyin Wu (CRC)

January 2020 CRWG In Person
Meeting

First CRWG indicators project

- GIT Funded Project:
 - 2017 - 2018
 - Eastern Research Group, Inc. (ERG)
- Goal: Conceptualize, select, and partially develop a suite of indicators that can be used to track progress toward the Climate Resiliency goal and outcomes in the 2014 Watershed Agreement

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Indicator development process

210 topics

- ERG developed a master list of potential topics

21 indicators

- Criteria was created for choosing indicators for development
- ERG proposed a suite of 21 indicators for possible development

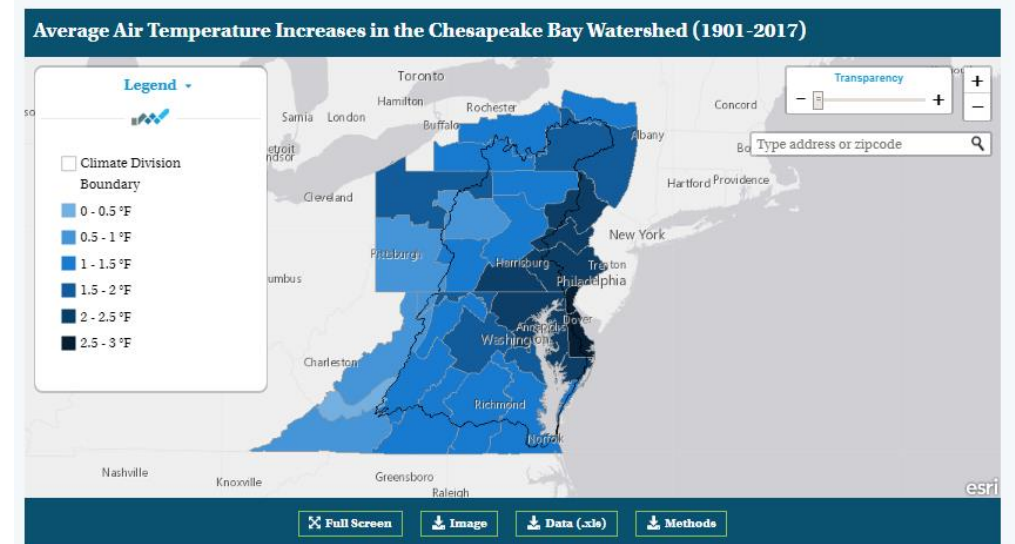
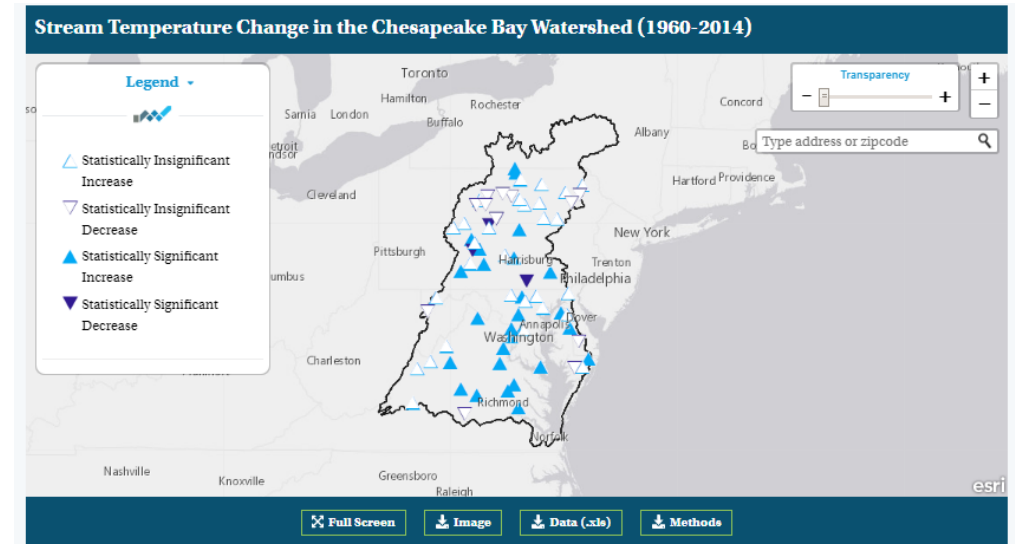
9 CBP indicators

- Data and metrics for 9 indicators were available immediately
- Two were existing indicators: Protected Lands and Restored Habitat
- Seven were new indicators posted to Chesapeake Progress
- [Indicator Implementation Plan](#)

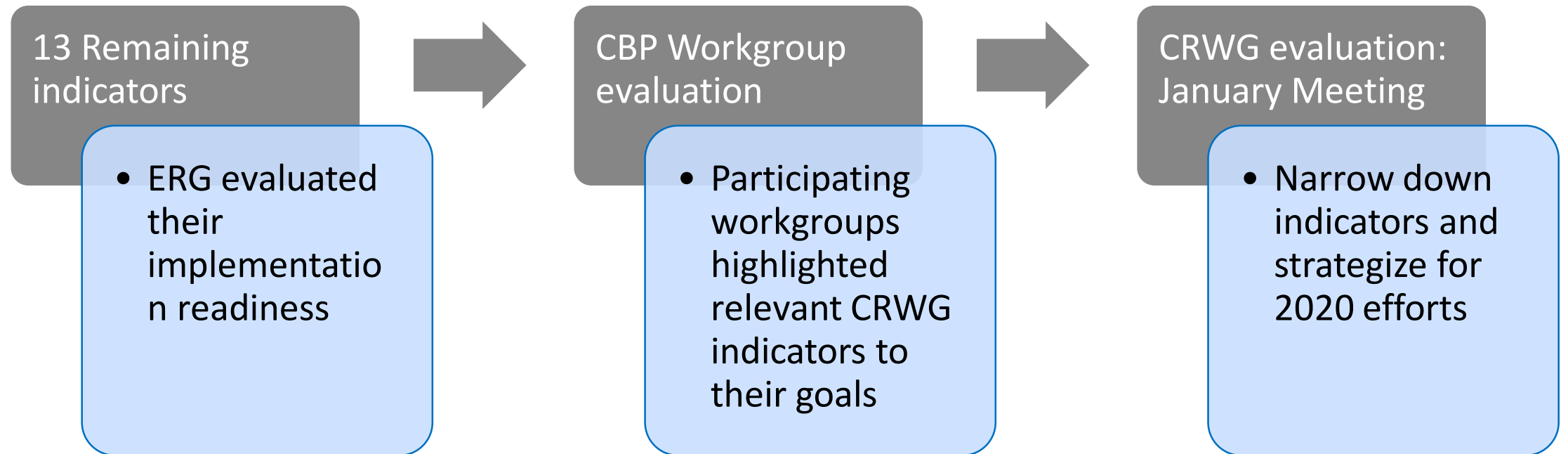
7 Climate Indicators on Chesapeake Progress

- Average Air Temperature Increases: now have data for 2018
- Change in High Temperature Extremes: now have data for 2018
- Stream Temperature Change: no change (1960 – 2014)
- Change in Total Annual Precipitation: now have data for 2018
- River Flood Frequency: no change (1965 - 2015)
- River Flood Magnitude: no change (1965 – 2015)
- Relative Sea Level Rise: now have data for 2018

<https://www.chesapeakeprogress.com/climate-change/climate-monitoring-and-assessment>



Remaining Indicators



Proposed Climate Indicator Framework

Physical Indicators
(Signals of Change)



Impact Indicators
(Ecological and Community Threats)



Resilience Indicators
(Readiness)

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Change in Bay Water
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Topic (green = indicator available)

Group A: Indicators for Physical Stressors

Air Temperature

Precipitation

Sea Level Change

Stream Water Temperature

Acidification (low pH; low carbonate availability)

Bay Water Temperature

Group B: Indicators for Climate Related Impacts

Upstream Flooding

Coastal Flooding

Harmful Algal Blooms

Property at Risk or Damaged

Wetland Extent and Physical Buffering Capacity

Bird Species Ranges

Fish Population Distribution

Submerged Aquatic Vegetation Composition

Group C: Indicators to Measure Climate Resiliency or Response

Protected Lands

Restored Habitat

Urban Tree Canopy

BMPs and Green Infrastructure

Land Use/Land Cover

Shoreline Condition

Wetland Migration Corridors

Climate
Indicator
Framework

Topic (green = indicator available)	Anticipated cost	Anticipated timeframe
Group A: Indicators for Physical Stressors		
Air Temperature	Low	Short-term
Precipitation	Low	Short-term
Sea Level Change	Low	Short-term
Stream Water Temperature	Low	Short-term
Acidification (low pH; low carbonate availability)	Low	Short-term
Bay Water Temperature	Moderate	Short-term
Group B: Indicators for Climate Related Impacts		
Upstream Flooding	Low	Short-term
Coastal Flooding	Low	Short-term
Submerged Aquatic Vegetation Composition	Medium	Medium-term
Wetland Extent and Physical Buffering Capacity	Medium	Short-term
Bird Species Ranges	Medium	Medium-term
Property at Risk or Damaged	High	Long-term
Fish Population Distribution	High	Long-term
Harmful Algal Blooms	TBD	Short-term
Group C: Indicators to Measure Climate		
Protected Lands	None	Short-term
Restored Habitat	None	Short-term
Land Use/Land Cover	Medium	Short-term
BMPs and Green Infrastructure	High	Medium-term
Shoreline Condition	High	Medium-term
Wetland Migration Corridors	High	Medium-term
Urban Tree Canopy	TBD	Short-term

Anticipated
Cost and
Timeframe