Chesapeake Bay Program Partnership

Climate Change Monitoring Needs Assessment

for

Forage Fish, Fish Habitat, Black Duck, Stream Health, Blue Crab, Oysters and Submerged Aquatic Vegetation

Prepared by STAR's Climate Resiliency and Integrated Monitoring Network Workgroups
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I. Background

Recognizing the need to gain a better understanding of the likely impacts of climate change as well as potential management solutions for the watershed, the 2014 *Chesapeake Bay Watershed Agreement*, committed the CBP partnership to take action to "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." In 2015, the Climate Resiliency Workgroup released a Management Strategy, which is currently being used to guide CBP implementation of efforts to achieve the Climate Resiliency Goal.

The Climate Resiliency Management Strategy calls for the design of a monitoring plan, to be informed by assessment of gaps, with respect to climate change monitoring. In response to this finding, the CRWG's Two Year Work Plan included the following actions:

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;
2) Catalogue monitoring gaps for 4 select Chesapeake Bay Agreement Management Strategies;
3) Identify gap-filling solutions by expanding the Partnership to include identified ongoing or planned monitoring efforts of climate factors; and
4) Develop a plan to fill identified gaps.

II. Process/Approach

Over the course of 2017, STAR's Climate Resiliency Workgroup, with support from the Scientific and Technical Advisory Committee (STAC)[i], will be undertaking and supporting the following activities to assess monitoring needs of 7- select outcomes under the Sustainable Fisheries and Vital Habitat Goal Implementation Teams.

Table 1. Planned CRWG/STAC/CBP Support Activities

Goal	Outcome	Planned CRWG/STAC/CBP Support Activities
Sustainable Fisheries	Blue Crab Abundance	2017 STAC Monitoring & Adaptive Mgmt Wkshp
	Oyster	2017 STAC Monitoring & Adaptive Mgmt Wkshp
	Forage Fish	2017 STAR Monitoring Needs Assessment
	Fish Habitat	2017 STAR Monitoring Needs Assessment
Vital Habitats	Black Duck	2017 STAR Monitoring Needs Assessment
	Stream Health	2017 STAR Monitoring Needs Assessment
	SAV	2017 STAC Monitoring & Adaptive Mgmt Wkshp

III. Previous Needs Assessment

The assessment of monitoring needs will build off a previous assessment by the CBP Scientific and Technical Committee (STAC) in late 2015 to inform the program's prioritization of climate change impacts of most concern with respect to the Chesapeake Bay Agreement. During the facilitated exercise, STAC members were asked to: 1) explore and discuss aspects of climate change, which may impact the achievement of individual goals and outcomes (e g., restore x acres of wetlands by year xxxx); 2) assign a qualitative (low, medium, high) factor of risk in terms of the influence of future climate impact on "goal/outcome attainment"; and 3) to identify research and/or monitoring needs to fill critical information gaps. A summary of the results of this planning exercise related to blue crab, oysters, forage fish, fish habitat, black duck, stream health and SAV is provided below.

Table 2. STAC Climate Change Qualitative Factor of Risk Assessment

Goal	Outcome	STAC Qualitative Factor of Risk	Scientific Understanding of Ecological Impact and Adequacy of Monitoring	Identified Research/Monitoring Need
Sustainable Fisheries	Blue Crab Abundance	Medium	Not assessed by STAC	Not assessed by STAC
	Blue Crab Management	Medium	Not assessed by STAC	Not assessed by STAC
	Oyster	Medium	Not assessed by STAC	Not assessed by STAC

	Forage Fish	High	Poor	Monitoring climate drivers and assessing trends/cross-interactions (salinity, temp, disease).
	Fish Habitat	High	Poor	Monitoring impact of sea level rise and extreme events on shoreline change.
Vital Habitats	Black Duck	High	Poor	Assessment of high marsh habitat condition
	Stream Health	High	Poor	Not assessed by STAC
	SAV	High	Excellent	Not assessed by STAC

IV. Detailed Assessment/Questionnaire

The Climate Resiliency and Integrated Monitoring Networks Workgroups will be working one-on one with the Black Duck, Stream Health, Forage Fish and Fish Habitat to conduct an assessment of climate change monitoring needs, as follows:

Step One:

1. Outline gaps for watershed scale monitoring effort and/or within a specific geography. Assess needs in the following categories:

    a. Measure and assess trends or "factors influencing" (i.e., physical climate drivers);
    b. Assess ecological and societal response (i.e. impacts);
    c. Monitor programmatic progress toward building an effective response (i.e., adaptation).

2. Identify gaps related to monitoring of non-climate stressors that could exacerbate climate impacts.

Step Two:

3. Identify agencies/organizations through which commitments could be sought to fund or participate in filling monitoring gaps.

4. Identify opportunities to better integrate data collected by the CBP Monitoring Program and/or NOAA Chesapeake Bay Sentinel Site Cooperative (CBSSC) with CBP monitoring efforts.

5. Explore the use of citizen-based monitoring networks to fill gaps.

Step Three:

6. Identify costs associated with closing monitoring gaps.

7. Identify geographical overlap in monitoring efforts to explore opportunities for cost saving efficiencies and integration of priorities to include climate factors.

V. Findings (to be added)

VI. Next Steps (to be added)

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[i] A STAC Workshop, "*An Analytical Framework for Aligning Chesapeake Bay Program (CBP) Monitoring Efforts to Support Climate Change Impact and Trend Analyses and Adaptive Management (SAV, Blue Crab and Oysters)"* is planned for Spring, 2017.