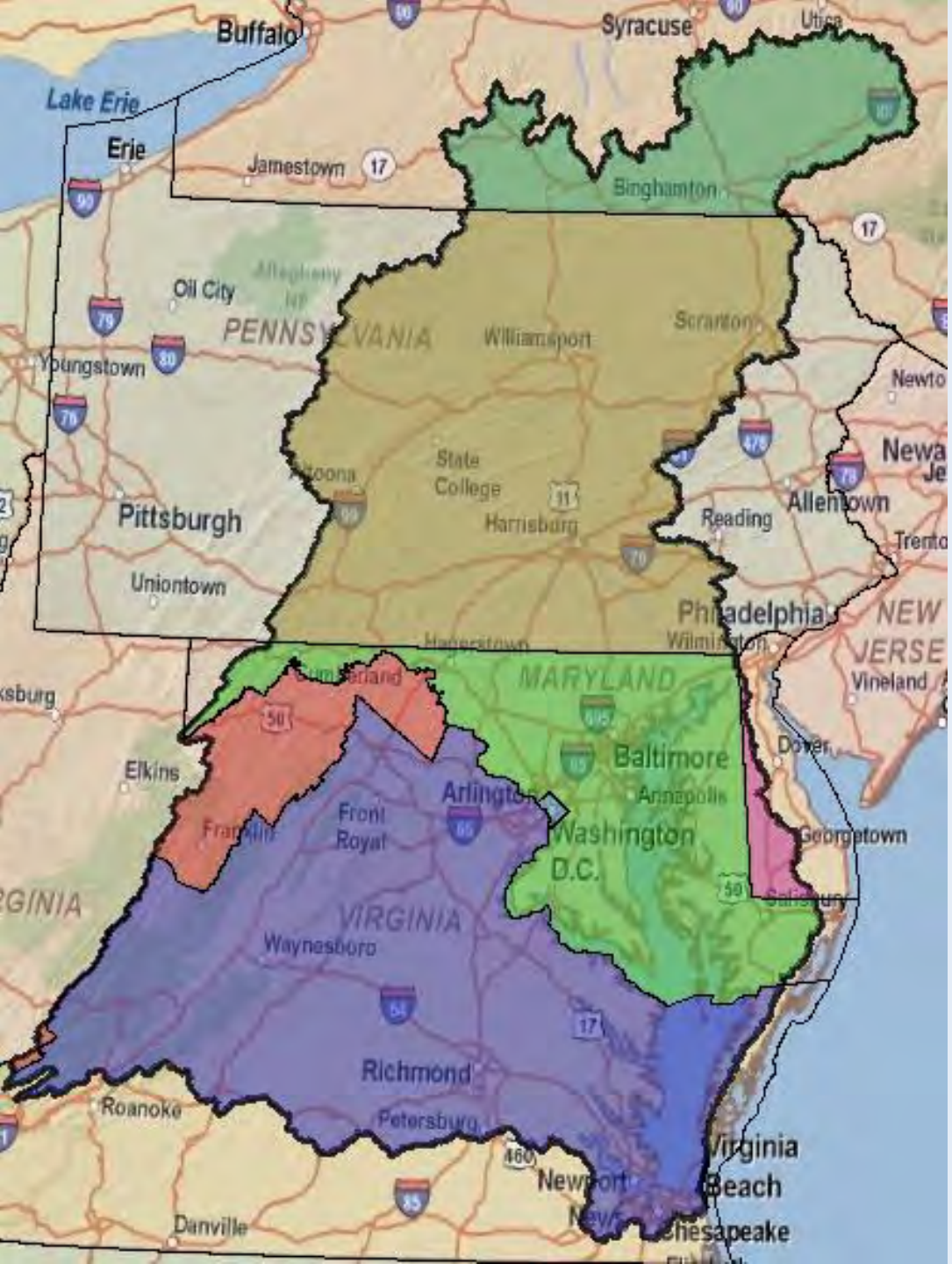
The Chesapeake Bay Program Partnership

Region 3 Summit

Amy Handen

Presentation Overview

- About the Chesapeake Bay
- Chesapeake Bay Program Partnership history and organization
- Status of restoration and protection goals
- Key topics



The Chesapeake Bay Watershed

(Photo Credit: CBP)

What is impacting the Bay?

Fisheries

- Disease
- Overfishing
- Invasive Species

Land and People

- Development
- Population
- Impervious Surfaces
- Stormwater

Climate Change

- Sea-level rise
- Warming waters
- Rising temperatures
- River flooding

Air and Water Pollution

- Chemical contaminants
- Sediment
- Nitrogen and Phosphorus

PARTNERSHIP HISTORY

- Chesapeake Bay Program formed (1983)
- 1987 *Chesapeake Bay Agreement* (1987)
- *Chesapeake 2000* Agreement (2000)
- MOU with DE, NY, WV (2000-2002)
- Chesapeake Bay Executive Order (2009)
- Chesapeake Bay TMDL (2010)
- *Chesapeake Bay Watershed Agreement* (2014)

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The Chesapeake Bay Program Partnership

NY DC VA MD PA DE WV

Bay Commission

Chesapeake Bay Program

Federal partners

CHESAPEAKE WATERSHED AGREEMENT

2014


An environmentally and economically sustainable Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders.


engage
manage
social
adaptively
science-based
science
represent
stakeholders
consensus
environmental
collaborate
justice
transparency

Watershed Agreement Goals

1. Sustainable Fisheries

2. Vital Habitats

3. Water Quality

4. Toxic Contaminants

5. Healthy Watersheds

6. Stewardship

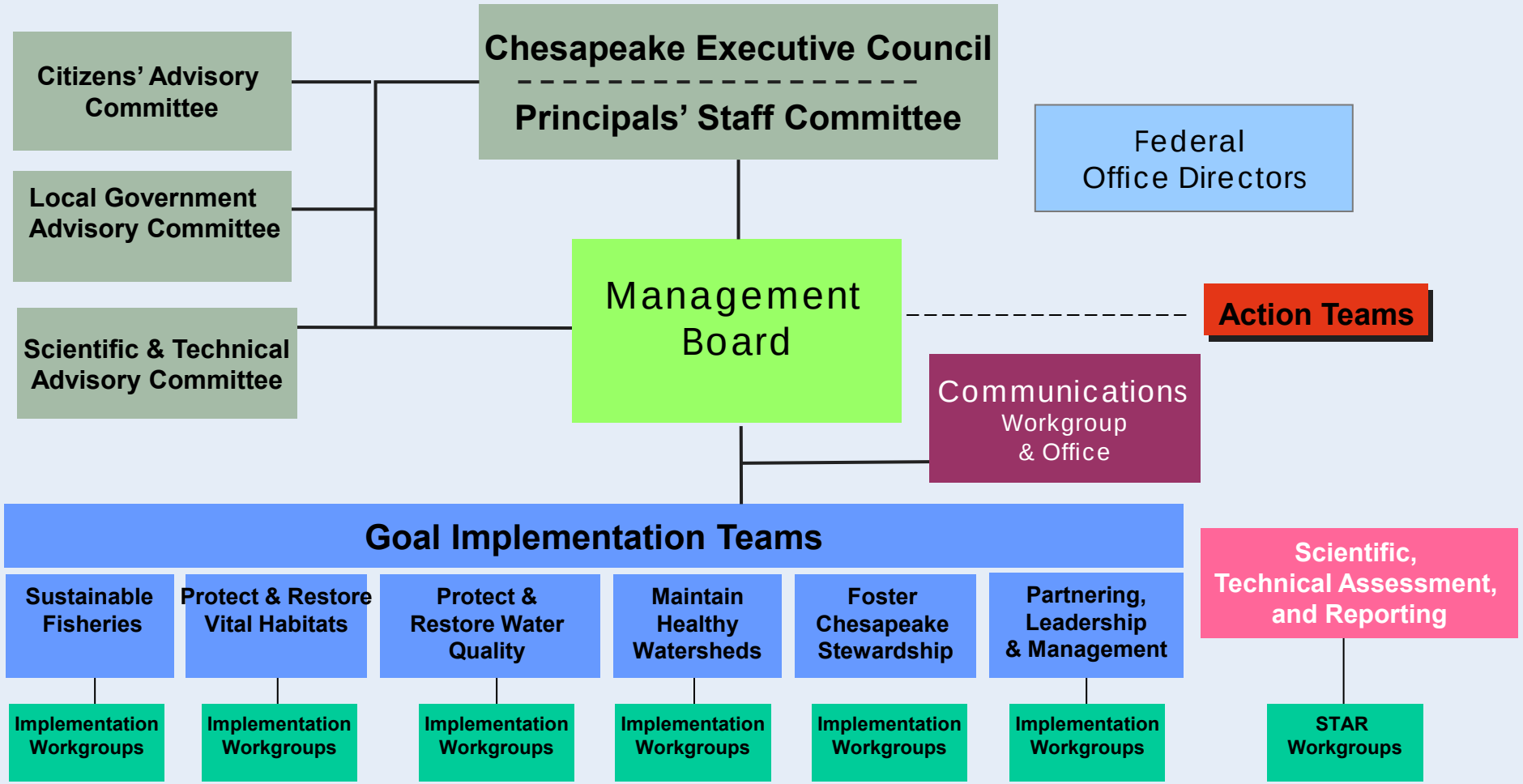
7. Land Conservation

8. Public Access

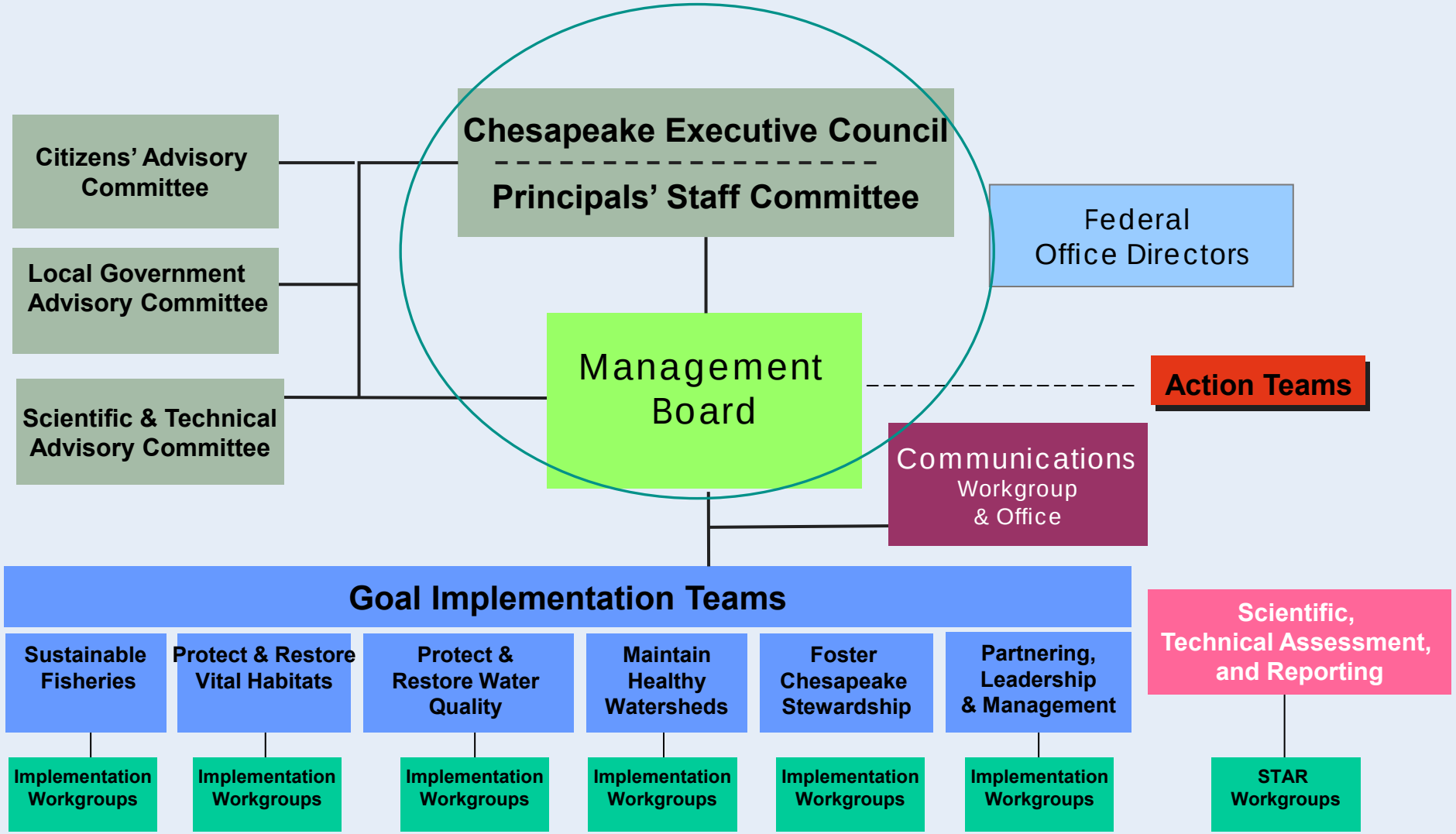
9. Environmental Literacy

10. Climate Resiliency

CBP PARTNERSHIP Structure and Leadership



CBP PARTNERSHIP Structure and Leadership



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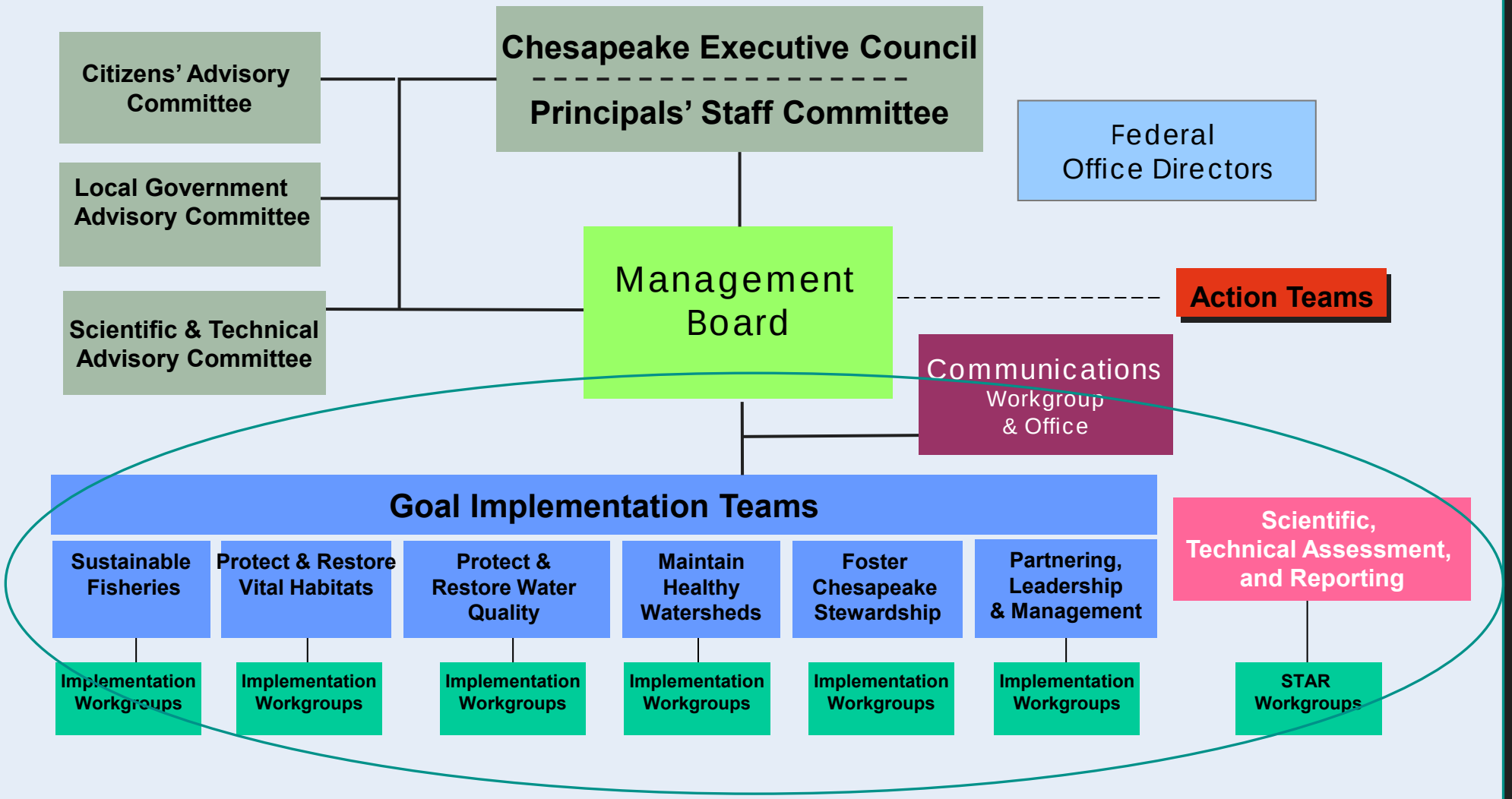

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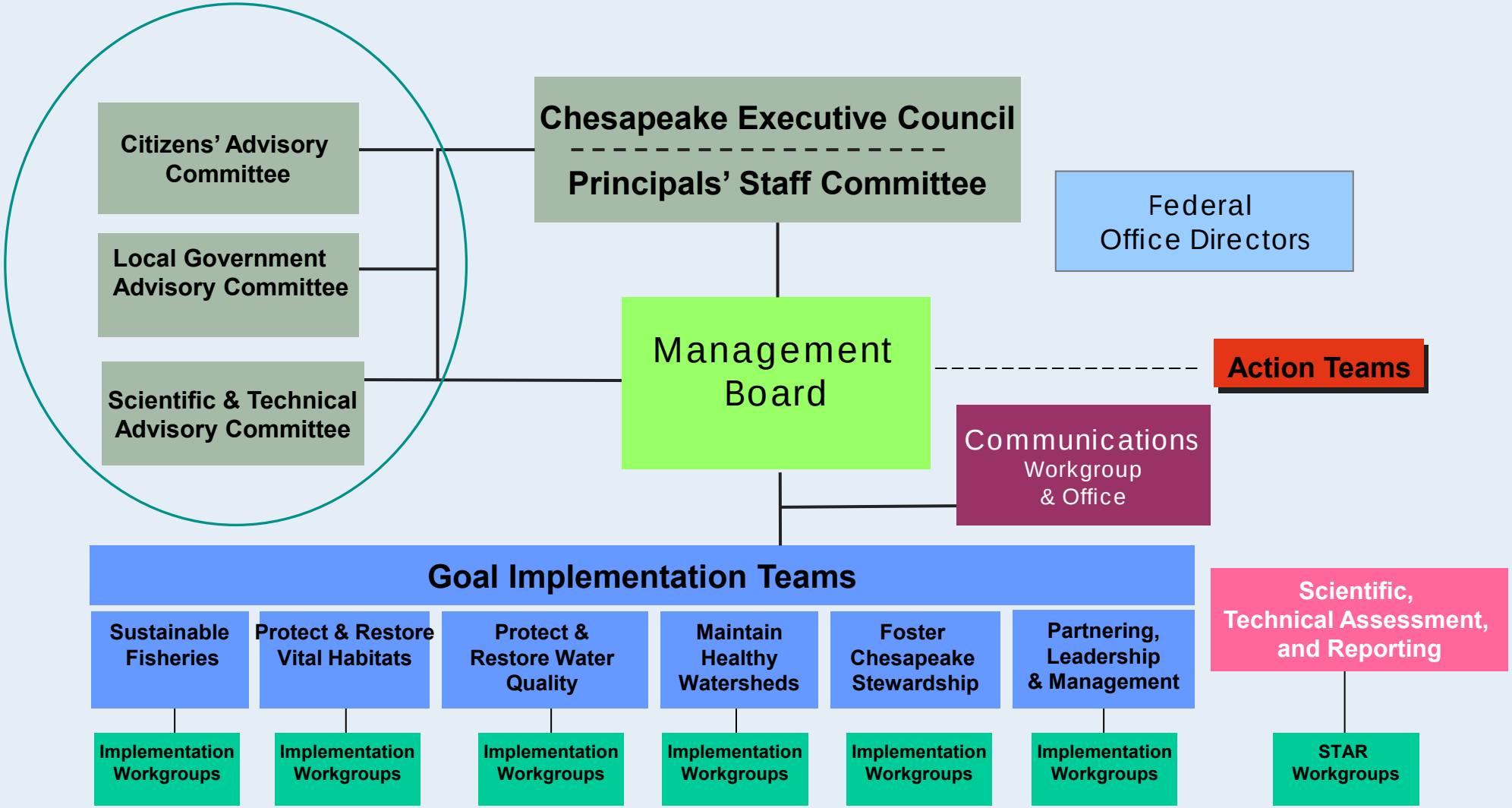

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CHESAPEAKE

PROGRESS

LAND CONSERVATION

Land Use Methods and Metrics Development Outcome	RECENT PROGRESS: NO CHANGE *Updated September 2016*	OUTLOOK: ON COURSE *Updated November 2021*
Land Use Options Evaluation Outcome	RECENT PROGRESS: INCREASE *Updated March 2018*	OUTLOOK: ON COURSE *Updated November 2021*
Protected Lands Outcome	RECENT PROGRESS: INCREASE *Updated July 2019*	OUTLOOK: ON COURSE *Updated November 2021*

PUBLIC ACCESS

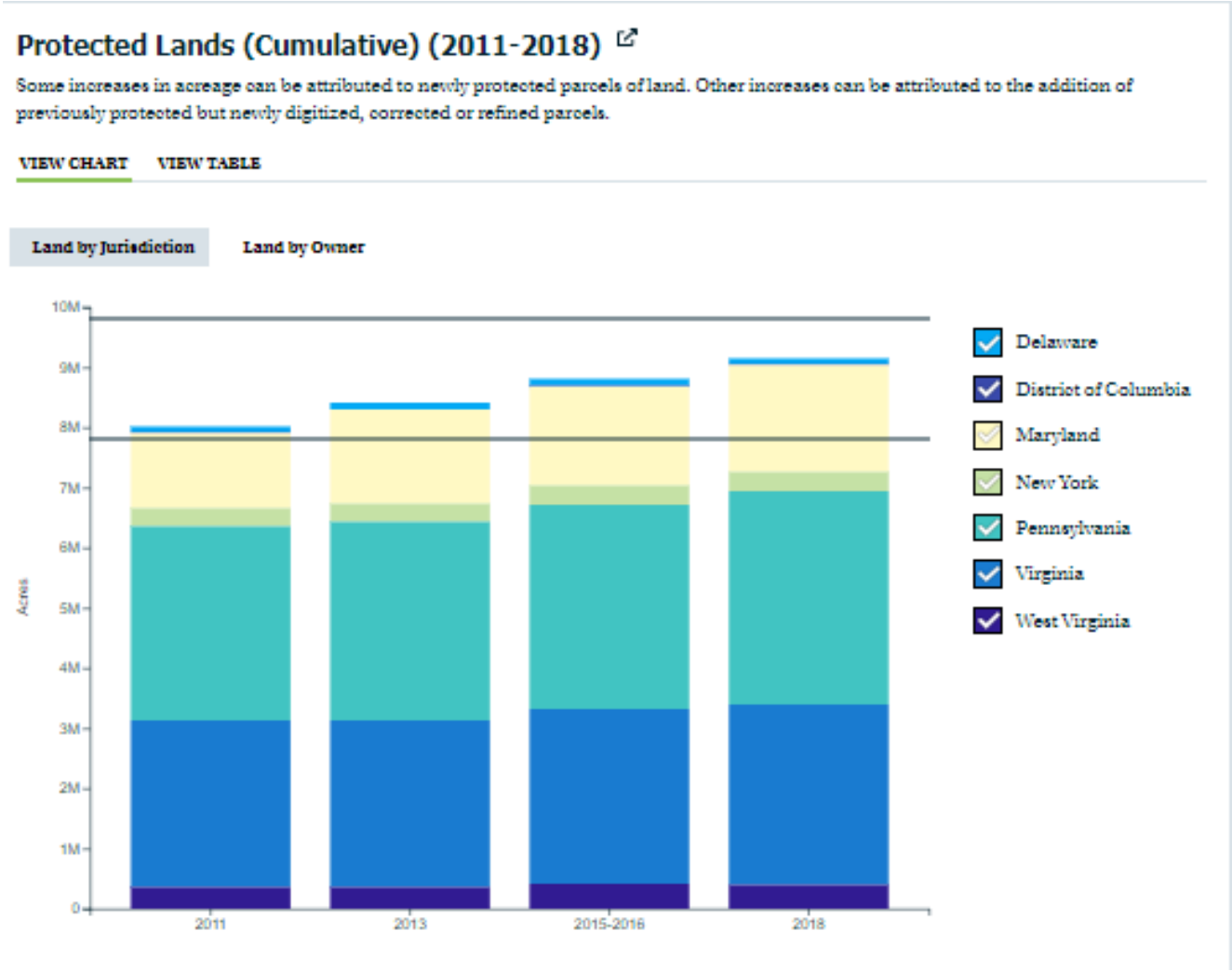
Public Access Site Development Outcome	RECENT PROGRESS: INCREASE *Updated August 2021*	OUTLOOK: ON COURSE *Updated February 2022*

Protected Lands

By 2025, **protect an additional two million acres of lands throughout the watershed**—currently identified as high-conservation priorities at the federal, state or local level—including 225,000 acres of wetlands and 695,000 acres of forest land of highest value for maintaining water quality.

Current Progress

According to data collected through early 2019, nearly 1.36 million acres of land in the Chesapeake Bay watershed have been permanently protected since 2010. This marks an achievement of 68% of the land conservation goal.

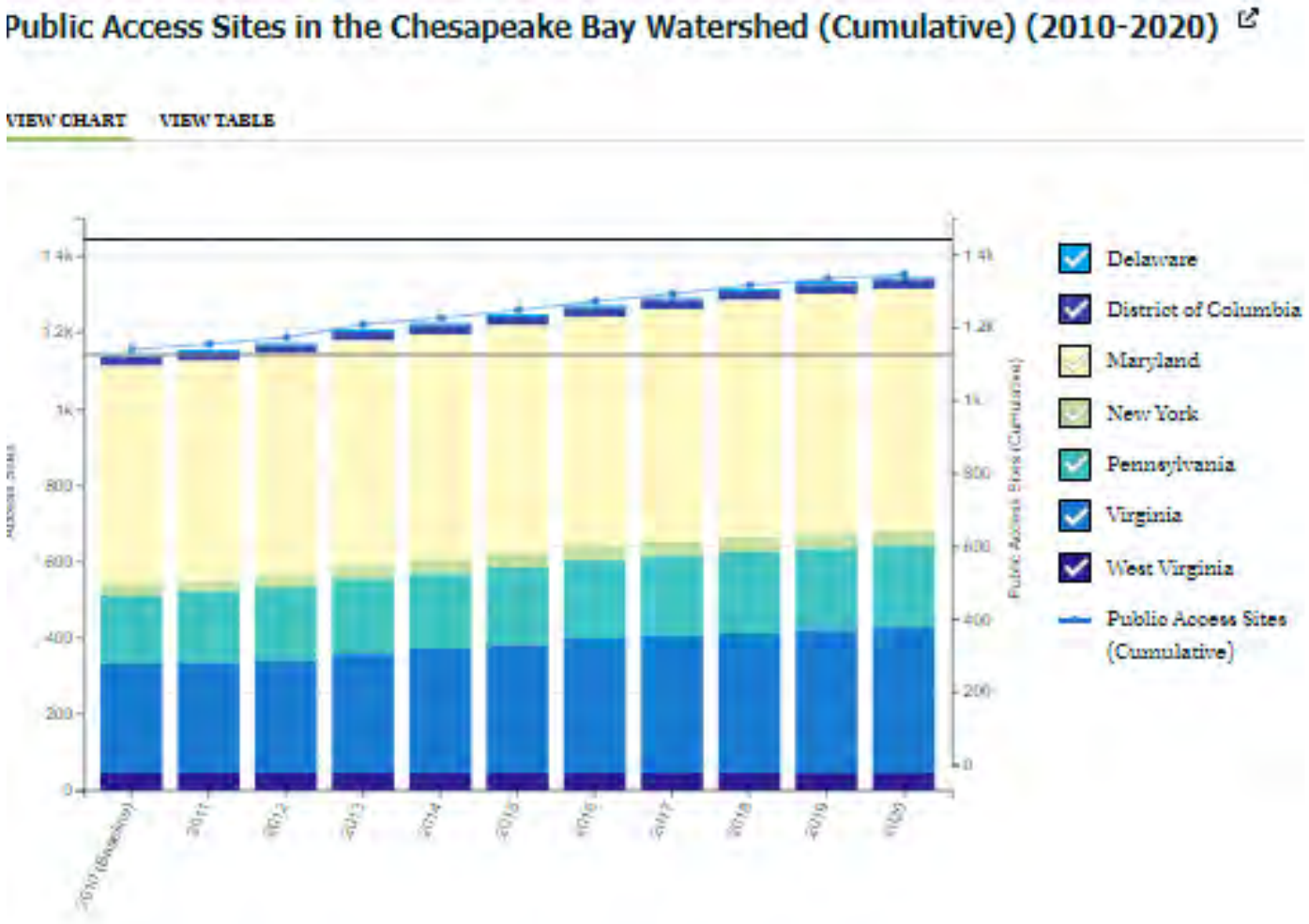


Public Access

By 2025, **add 300 new public access sites**, with a strong emphasis on providing opportunities for boating, swimming and fishing, where feasible.

Current Progress

In 2020, 12 new public access sites were added. This brings the total to **206 public access sites** that have opened on and around the Chesapeake Bay between 2010 and 2020, marking 69% achievement of the partnership's goal.



VITAL HABITATS

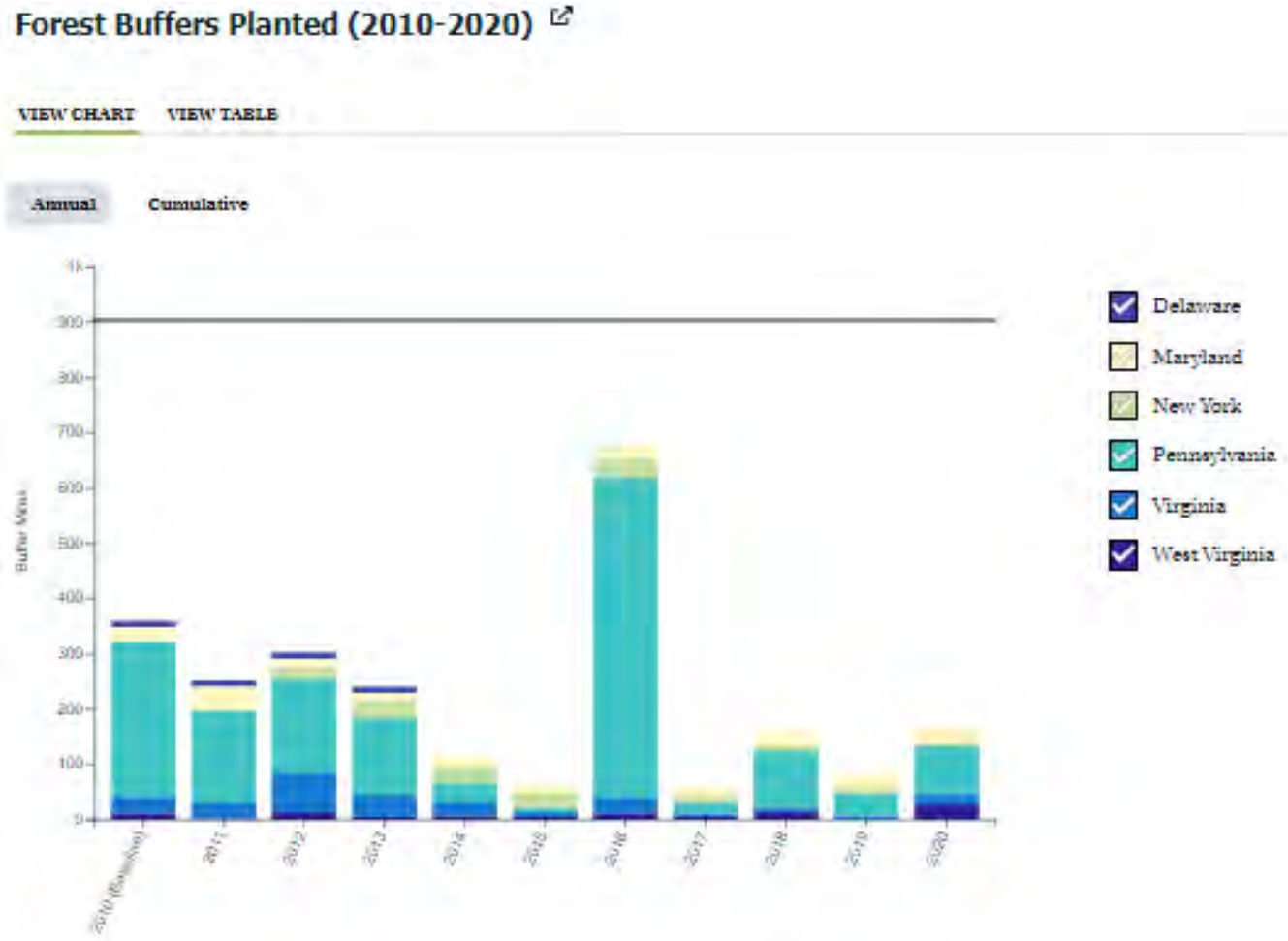
Black Duck Outcome	RECENT PROGRESS: INCREASE *Updated October 2018*	OUTLOOK: OFF COURSE *Updated November 2021*	→
Brook Trout Outcome	RECENT PROGRESS: NO CHANGE *Updated September 2019*	OUTLOOK: OFF COURSE *Updated November 2021*	→
Fish Passage Outcome	RECENT PROGRESS: INCREASE *Updated August 2021*	OUTLOOK: ON COURSE *Updated November 2021*	→
Forest Buffers Outcome	RECENT PROGRESS: DECREASE *Updated January 2022*	OUTLOOK: OFF COURSE *Updated November 2021*	→
Stream Health Outcome	RECENT PROGRESS: NO CHANGE *Updated March 2018*	OUTLOOK: UNCERTAIN *Updated November 2021*	→
Submerged Aquatic Vegetation (SAV) Outcome	RECENT PROGRESS: DECREASE *Updated July 2021*	OUTLOOK: OFF COURSE *Updated November 2021*	→
Tree Canopy Outcome	RECENT PROGRESS: NO CHANGE *Updated October 2018*	OUTLOOK: OFF COURSE *Updated November 2021*	→
Wetlands Outcome	RECENT PROGRESS: INCREASE *Updated June 2018*	OUTLOOK: OFF COURSE *Updated November 2021*	→

Forest Buffers

Continually increase the capacity of forest buffers to provide water quality and habitat benefits throughout the Chesapeake Bay watershed. **Restore 900 miles of riparian forest buffers per year and conserve existing buffers until at least 70 percent of riparian areas in the watershed are forested.**

Current Progress

In 2020, 169 miles of forest buffers were planted along rivers and streams in the Chesapeake Bay watershed. While this is an increase from 2019 in which 83 miles of forest buffers were planted, it is 731 miles below the 900-mile-per-year target.

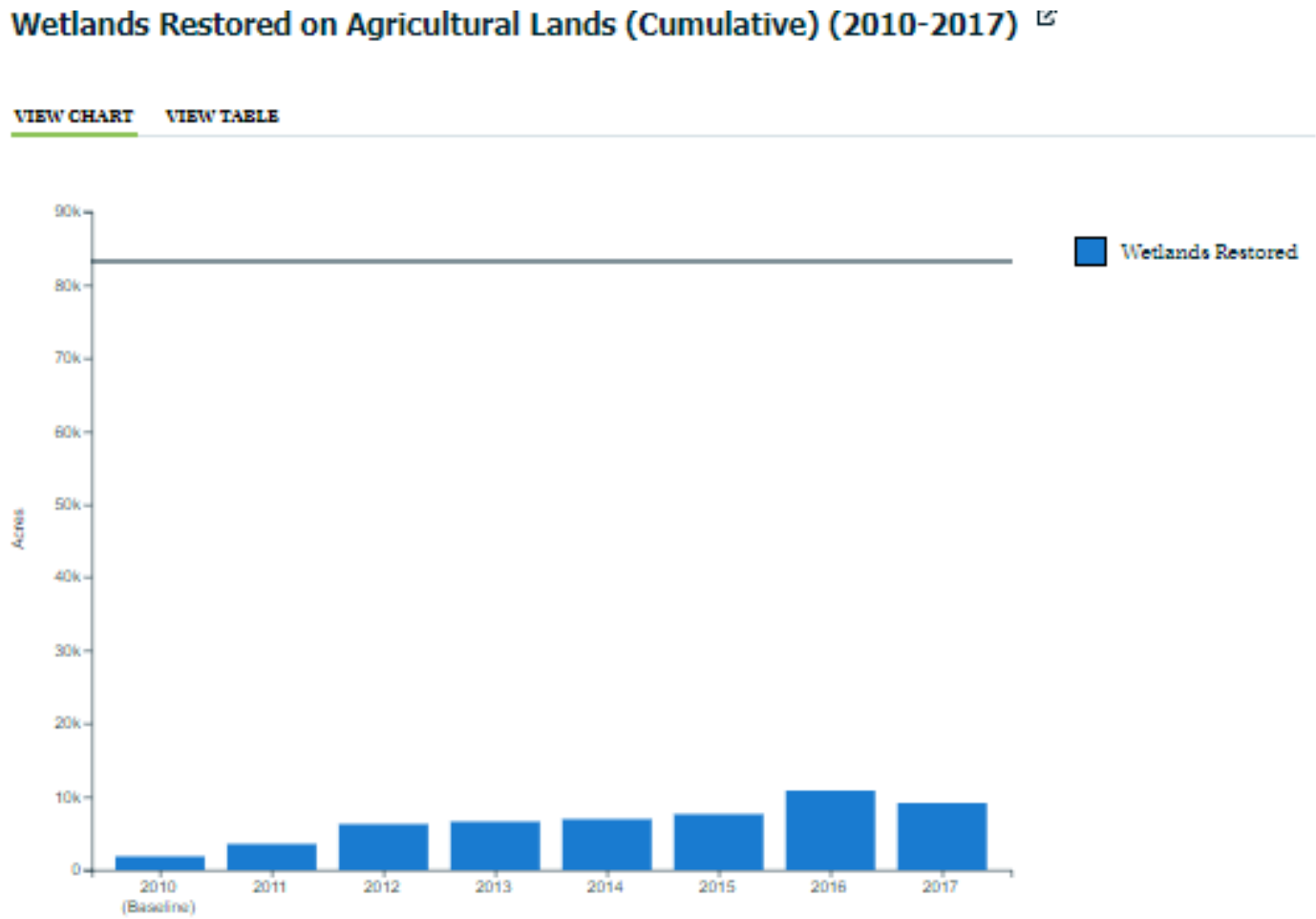


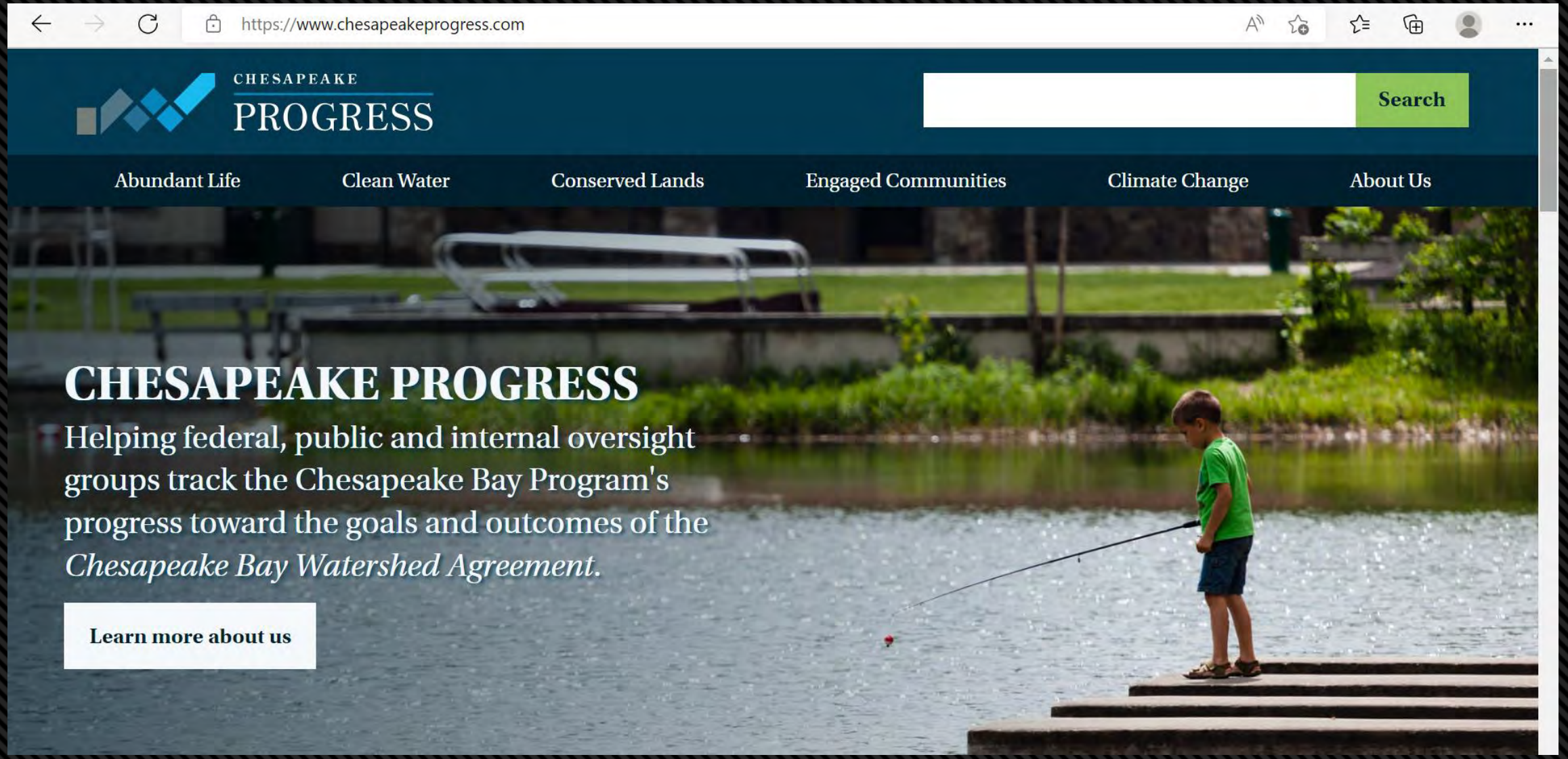
Wetlands

Continually increase the capacity of wetlands to provide water quality and habitat benefits throughout the watershed**. Create or reestablish 85,000 acres of tidal and non-tidal wetlands and enhance function of an additional 150,000 acres of degraded wetlands by 2025**.

Current Progress

Between 2010 and 2017, 9,103 acres of wetlands were established, rehabilitated or reestablished on agricultural lands. The wetlands restored on agricultural lands between 2010 and 2017 mark an 11% achievement of the 83,000-acre goal.

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CHESAPEAKE PROGRESS
Helping federal, public and internal oversight groups track the Chesapeake Bay Program's progress toward the goals and outcomes of the *Chesapeake Bay Watershed Agreement.*
Learn more about us

Key Topic: Chesapeake Total Maximum Daily Load

- In 2010, Chesapeake Bay **Total Maximum Daily Load** "pollution diet" established to restore the health of the Bay and its local streams, creeks and rivers.
- Reflects the partnership goal of having all practices and controls in place by 2025 to restore the Bay and its tidal rivers.
- A number of elements are in place to help meet this partnership goal:
  - The **Watershed Implementation Plans** are the roadmaps for how the Bay jurisdictions will meet the necessary nutrient and sediment load reductions.
  - Short-term goals, called **two-year milestones**
- **States have reported that, as of 2020, the best management practices (BMPs) in place to reduce pollution are estimated to have achieved 45% of the nitrogen reductions, 65% of the phosphorus reductions and 100% of the sediment reductions needed to attain applicable water quality standards.**

Key Topic: Diversity, Equity, Inclusion and Justice

- The **2014 Watershed Agreement contains a guiding principle for environmental justice and a diversity outcome** with targets to increase representation of people of color to 25% of the Bay program participations with 15% in leadership by 2025.
- A **Comprehensive Strategy was created in 2020** that provided recommendations for how the Chesapeake Bay Program could better integrate DEIJ principles into our work.
- In August 2020, the **Chesapeake Executive Council signed a DEIJ Statement** for the partnership reaffirming their commitment to embrace DEIJ in all areas of the CBP.
- An **Action Statement was signed by the CBP's Principals' Staff Committee (PSC**) committing, among other things, to develop an implementation plan.
- **This Chesapeake Bay Program Diversity, Equity, Inclusion and Justice Strategy Implementation Plan,** completed in December 2021, presents a roadmap for advancing the Strategy.

Key Topic: Climate Change

- **2014 Chesapeake Watershed Agreement includes goal to increase the resiliency of the Chesapeake Bay watershed** to withstand adverse impacts from changing environmental and climate conditions. Outcomes to:
  - Monitor and assess trends and impacts from climate change
  - Pursue, design and construct restoration and protection projects to enhance the resiliency of Bay and aquatic ecosystems from the impacts of climate change.
- In October 2021, **EC signed a directive that commits the Chesapeake Bay Program to address the increasing threats of climate change** in all aspects of the partnership's work.
  - Partnership is developing a work plan to identify collaborative actions to implement the directive
- In May 2022, **federal agencies collectively committed to** actions to help mitigate and adapt to climate change.

Key Topic: Bipartisan Infrastructure Law

- BIL included funds allocated to **EPA for the Chesapeake Bay $238 million over 5 years**.

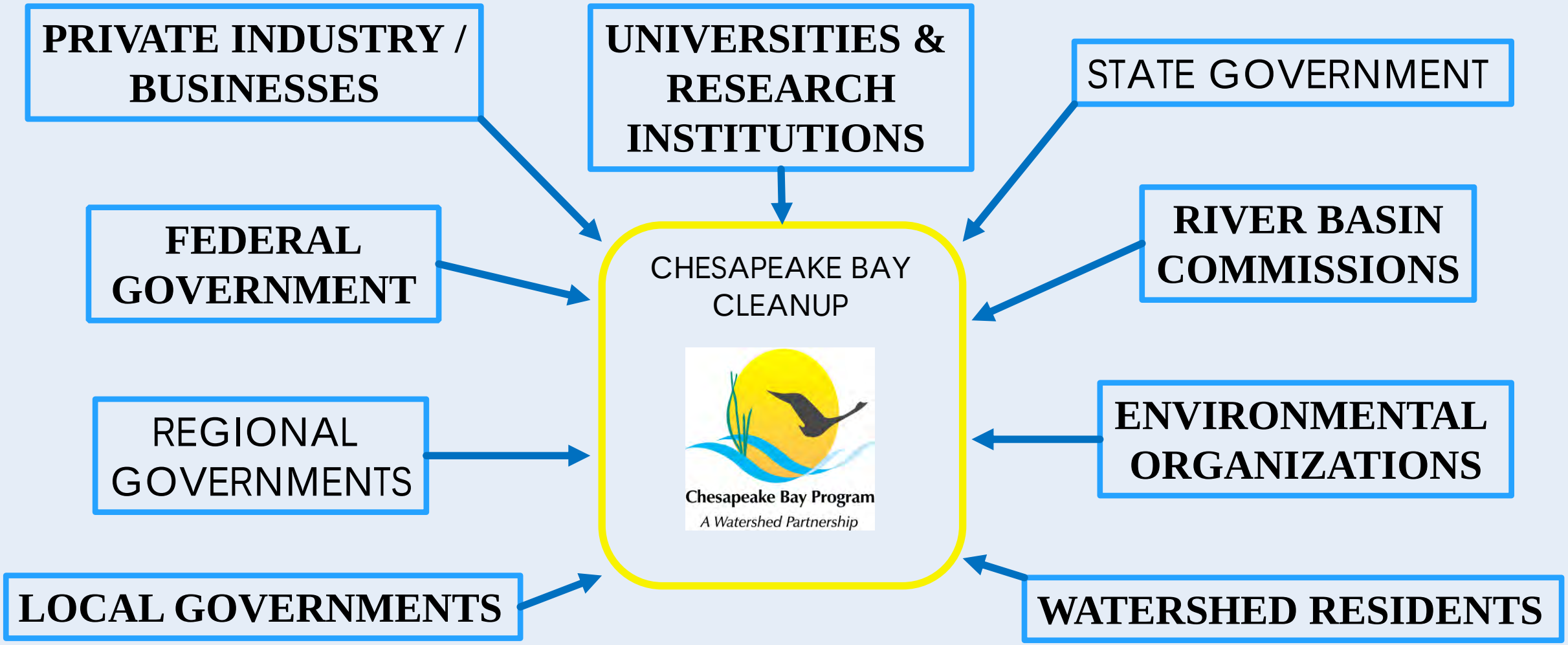
- FY 2022 EPA Chesapeake funds – $47.8 million:

  - **$40 million directed to fund Innovative Nutrient and Sediment Reduction Grants, Small Watershed Grands and Most Effective Basins**

    - $25 million in NFWF funds will be awarded competitively to communities, non-profit groups, conservation districts and others for projects and plans to protect and restore local streams and habitat in the Bay watershed.
    - $15 million will be distributed to the six watershed states and the District of Columbia under the Most Effective Basins (MEB) program, 40% of which will be targeted for MEB projects in environmentally overburdened communities.

  - **Remaining infrastructure funding will be targeted to advance Administration goals and Partnership priorities**

The Bay Cleanup Involves Partners at All Levels



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handen.amy@epa.gov

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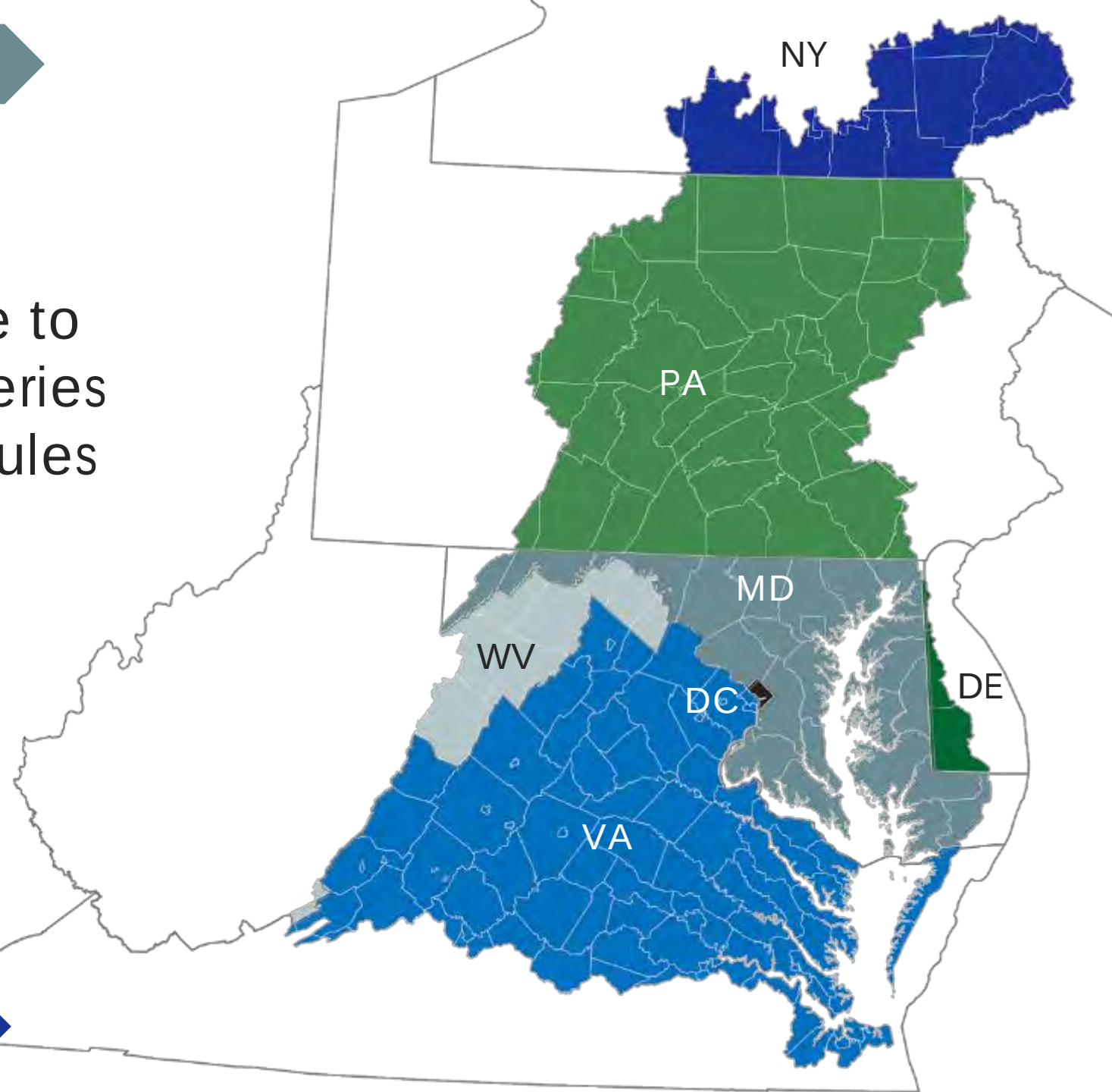
A Local Government Guide to the Chesapeake Bay

Overview of Educational Modules

Michelle Edwards
Rappahannock-Rapidan Regional Commission

Empowering local decisions

A Local Government Guide to the Chesapeake Bay is a series of seven educational modules to inform and empower decision at local levels.



About the modules

Developed as self-guided, very visual PowerPoint presentations. Each module is under 30 slides, designed to be easily customized and shared, along with a companion one-page handout.

- Economic Development
- Public Health & Safety
- Infrastructure Maintenance & Finance
- Education

Overview of Modules

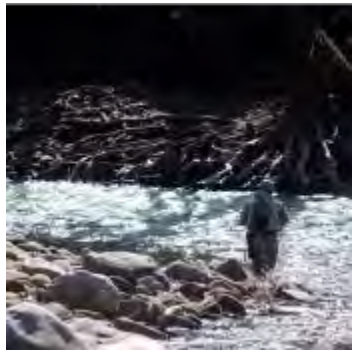
1. How Your Watershed Works

Foundational knowledge of the Chesapeake Bay watershed and water cycle and connects the importance of a healthy watershed to the economic development, public health and safety, infrastructure maintenance and finance, and education priorities of local government officials.

2. Foundations of Clean Water

An overview of the laws and agreements relevant to protecting and restoring the Chesapeake Bay. These protections are the foundations for healthy local waterways across the region.

Modules Overview



3. Clean Water for the Economy

Highlights the economic importance of clean water and healthy habitats to lucrative fisheries, like blue crab and oyster, and recreational activities, like hunting, bird watching, and fishing.

4. Capitalizing on the Benefits of Trees

Presents how tree canopy, forest buffers, and forest conservation can provide a broad spectrum of benefits for local communities, from economic development to significant public health and safety benefits.

5. Preserving Local Character and Landscapes

Highlights the economic, ecological, cultural, and recreational value of the conserved landscapes around the Chesapeake Bay watershed to the people and communities of the region. Conserving these landscapes protects water quality, quality of life, and the many community values associated with these lands.

Modules Overview

6. Protecting Community Infrastructure Through Stormwater Resiliency

An overview on how managing stormwater runoff and increasing resiliency can mitigate flooding and flood-related damages to local community infrastructure, while also improving water quality.

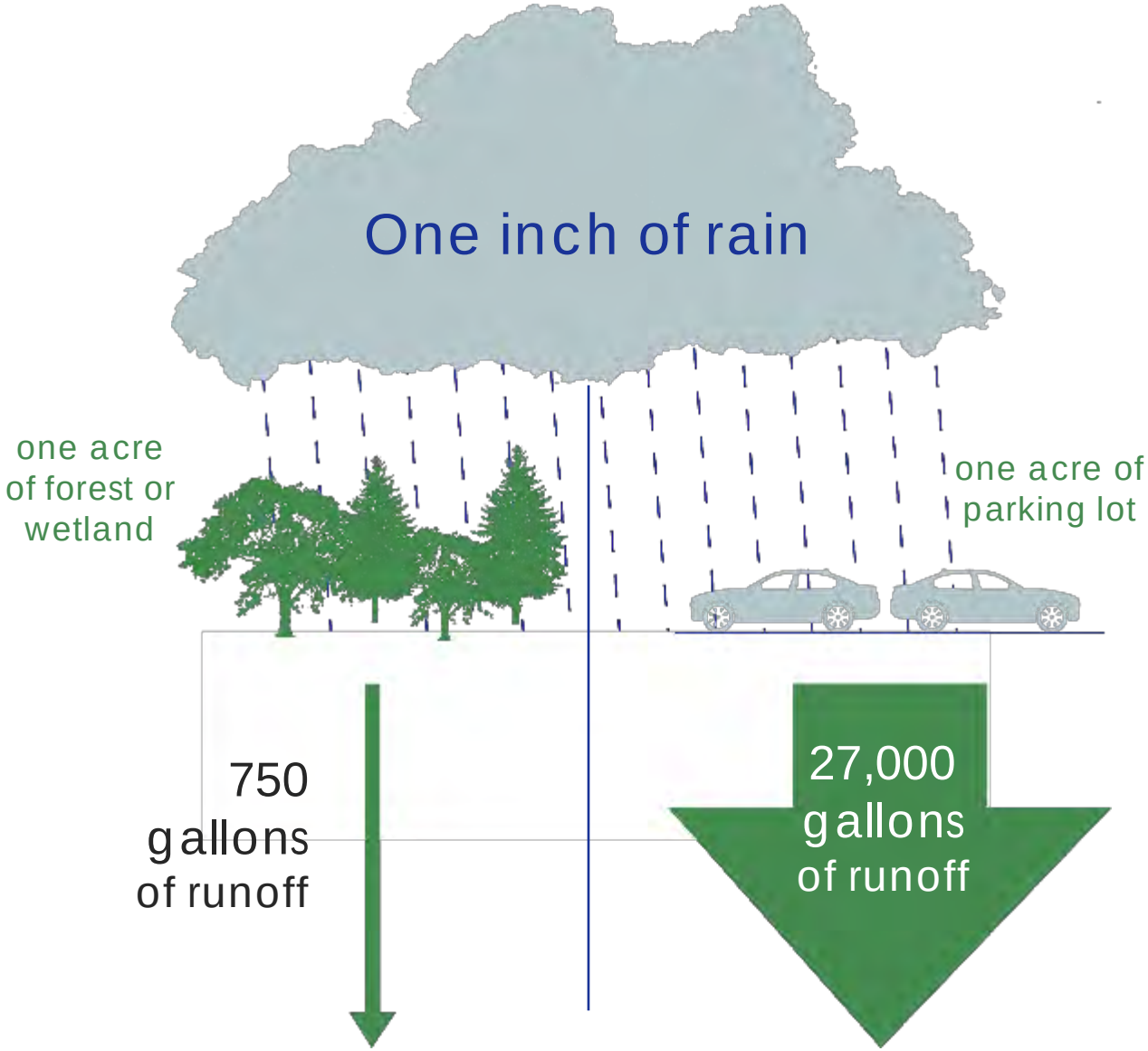
7. Building the Workforce of Today and Tomorrow

Highlights the growth in stormwater management and green infrastructure projects and the importance of educating a strong and diverse workforce in operating and maintaining projects.

Module Features

- ***What You'll Learn*** - learning objectives and questions that will be answered throughout the module.
- *What You Can Do* - actionable items to engage your community and where applicable, financial assistance to support local actions.
- *To Learn More* - additional resources for further learning about each of the module topics.
- Reference sources for statistics, data, and photos can be found along with photo credits within the notes for each of the individual slides.
- Glossaries defining keywords can also be found at the end of each module.

Natural Landscapes



Natural landscapes, like forests and wetlands (see next slide), reduce the amount of runoff that your community experiences. As your community develops and more parking lots, roofs, and roads are built, keep in mind that losing natural landscapes and increasing impervious surfaces have negative impacts on stormwater resilience. Make a plan to mitigate these increases in stormwater to keep your community resilient.

Outdoor Recreation

Nationally, outdoor recreation contributes:

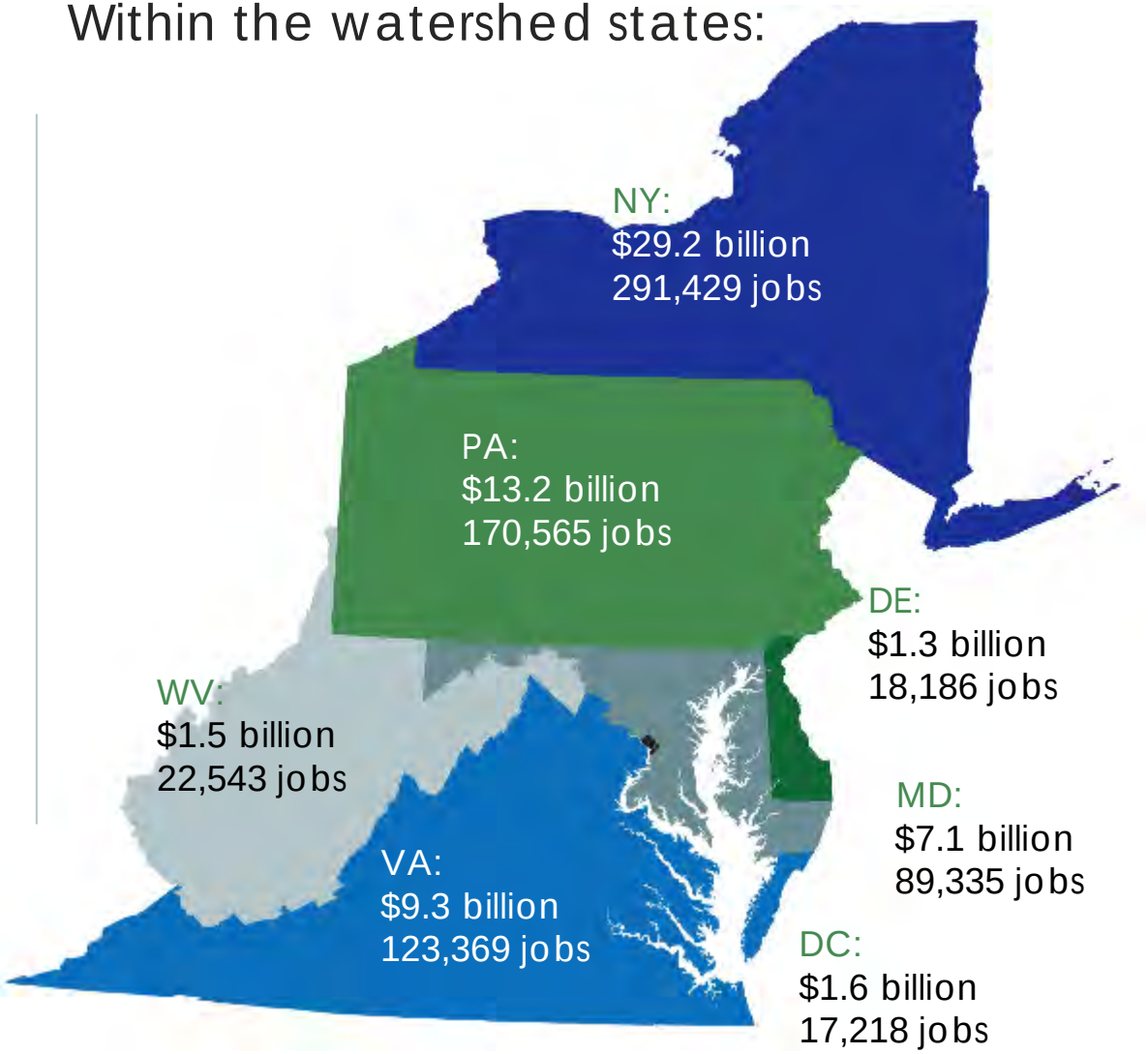
$887 BILLION
in consumer spending

7.6 MILLION
American jobs

$65.3 BILLION
in federal tax revenue

$59.2 BILLION
in state & local taxes

Within the watershed states:



Interpretive Outdoor Experiences

Outdoor recreation opportunities foster a more meaningful connection with nature. Nature centers and environmental educators play important roles in inspiring an appreciation for nature, which leads to more stewardship.

How can the modules be used?

Audience

↕

Trusted Source

↕

Translators ⟷ Subject Matter Experts

VML — Virginia Municipal League

MML — The Maryland Municipal League

Maryland Association of Counties

PSATS — Pennsylvania State Association of Township Supervisors

Pennsylvania State Association of Boroughs

How are the modules being used?

- **Conference Panel Handouts**
  - *County Commissioners Association of Pennsylvania 2021 Panel on "The Outdoor Recreation Economy"*

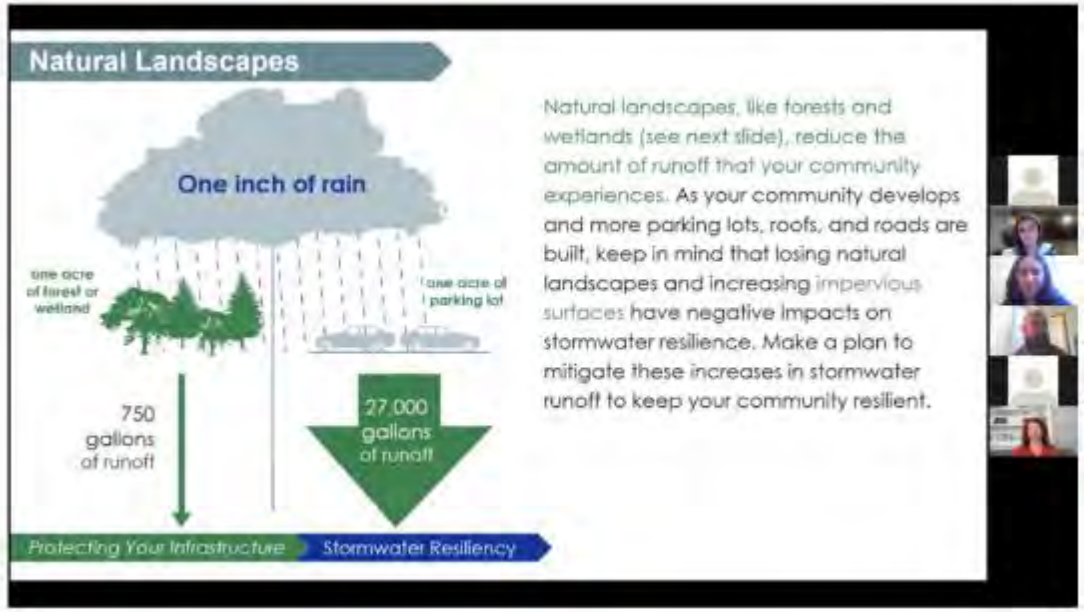
- **Web-based Resources**
  - *Hampton Roads Planning District Commission website (2022)*

- **Email Series to Local Governments**
  - *Delaware's Department of Natural Resources and Environmental Control (on-going)*

How are the modules being used?

- **Magazine Article**
  - *2021 Boroughs Magazine article (Pennsylvania State Association of Boroughs)*

- **Local Government Professional Development Course**
  - *Maryland Municipal League and Maryland Association of Counties elective course on "How Your Watershed Works" in 2021*



Impact to Date

- **300+ people** have accessed the editable versions of the modules

- Modules have been utilized in **Delaware, Maryland, New York, Pennsylvania, and Virginia**

- Modules have directly reached an estimated **1,600 local government officials and staff**

"We've been sharing the modules with all of the town officials in Delaware and right off the bat, at least 50% are actively accessing and using the materials, so it's been very successful here."

- The Honorable H. Donovan Phillips, Jr., Local Government Advisory Committee member and former Councilmember Town of Laurel, DE

Next Steps

- Develop **3 – 4 additional modules**
- Create an **online repository** to store materials
- A **‘train the trainer’ workshop** on how to use the modules

Questions?

Contact: Laura Cattell Noll
lnoll@allianceforthebay.org

Maintaining the Resilience of Stormwater and Restoration Practices in the Chesapeake Bay Watershed

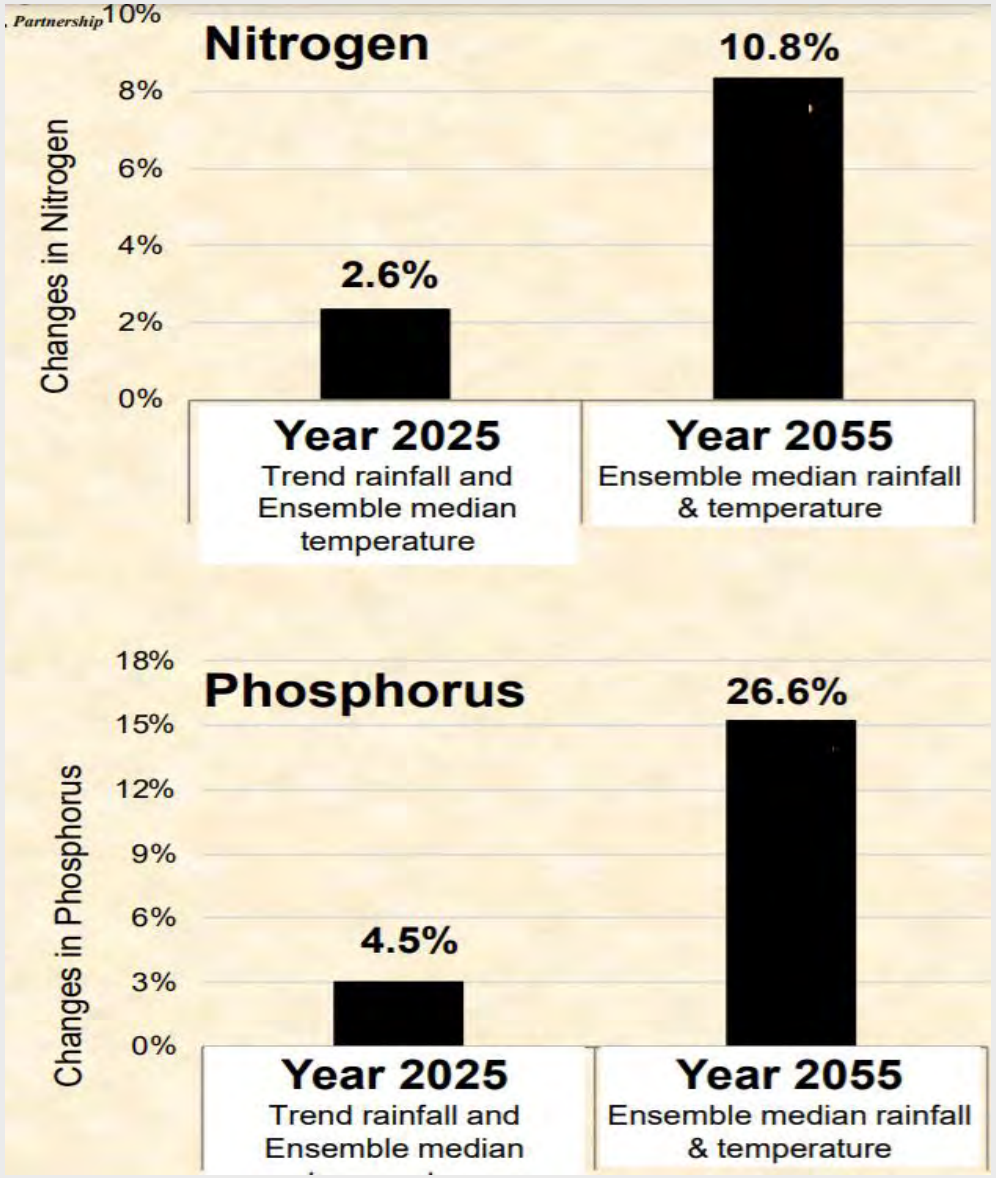
EPA Mid-Atlantic Summit
May 25, 2022

BUILDING THE TOOLS FOR RESILIENT STORMWATER PRACTICES

CBPO CLIMATE ASSESSMENT: PRECIPITATION

Table 2. Percent change in rainfall volume as compared to 1995 (CBP, 2019)

Geography	**Year 2025**	**Year 2035**	**Year 2045**	**Year 2055**
Delaware	2.06%	3.10%	4.14%	6.23%
Maryland	3.09%	4.13%	4.92%	6.70%
Virginia	2.56%	3.68%	5.23%	6.50%
Pennsylvania	3.28%	4.46%	5.07%	6.32%
District of Columbia	3.14%	4.11%	5.07%	6.83%
West Virginia	2.72%	3.73%	5.23%	6.53%
New York	5.00%	6.09%	5.99%	6.24%
CB Watershed	**3.11%**	**4.23%**	**5.19%**	**6.44%**



Source: CBPO Climate Assessment

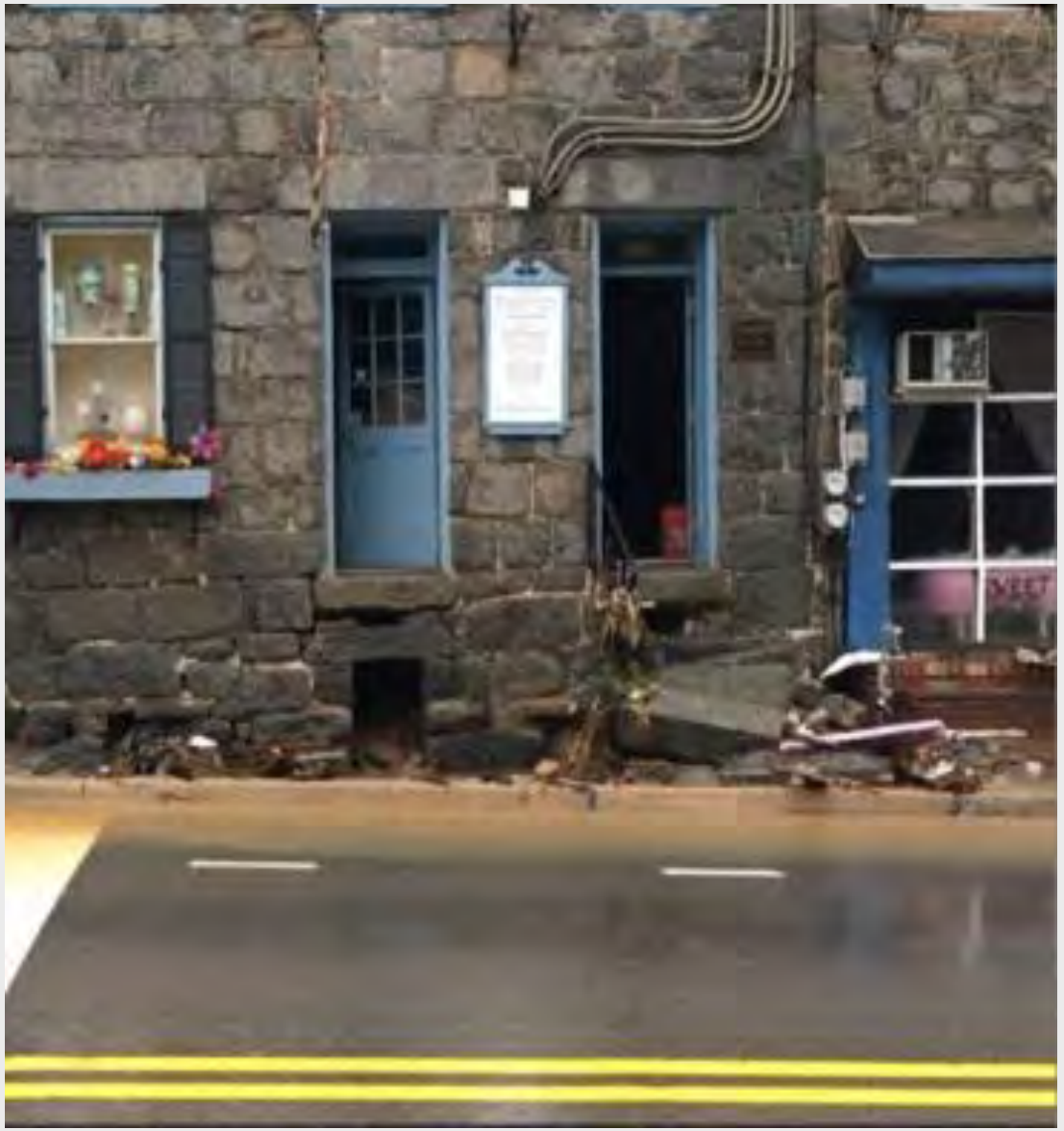
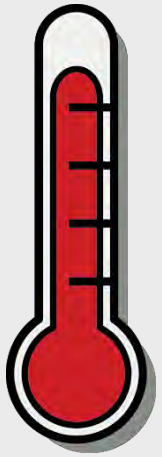


Photo courtesy: Libby Solomon

Climate Change in the Chesapeake



2-3°F of warming

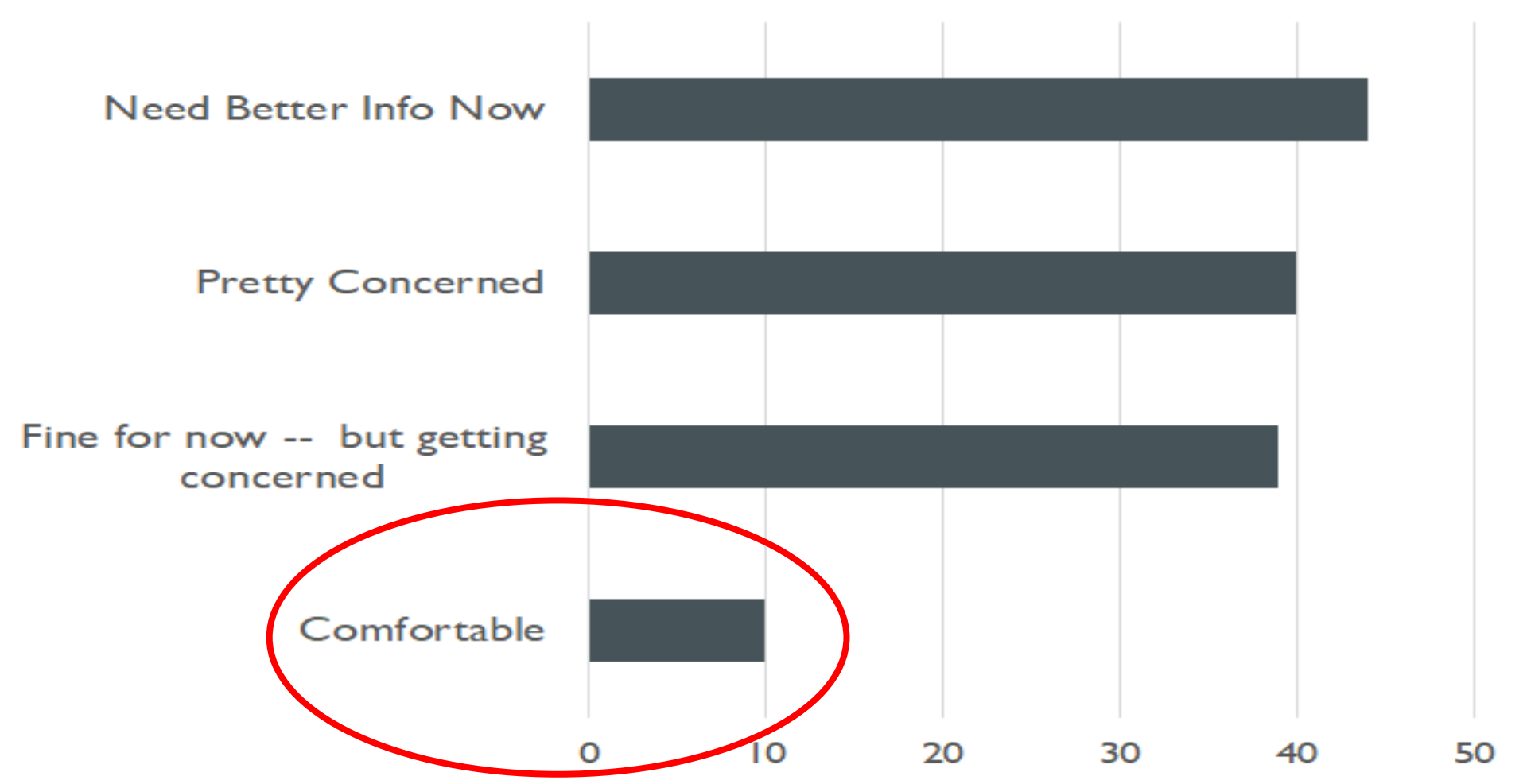
1-2 feet of sea level rise

5-35% increase in precip intensity +
4-5% increase in precip volume

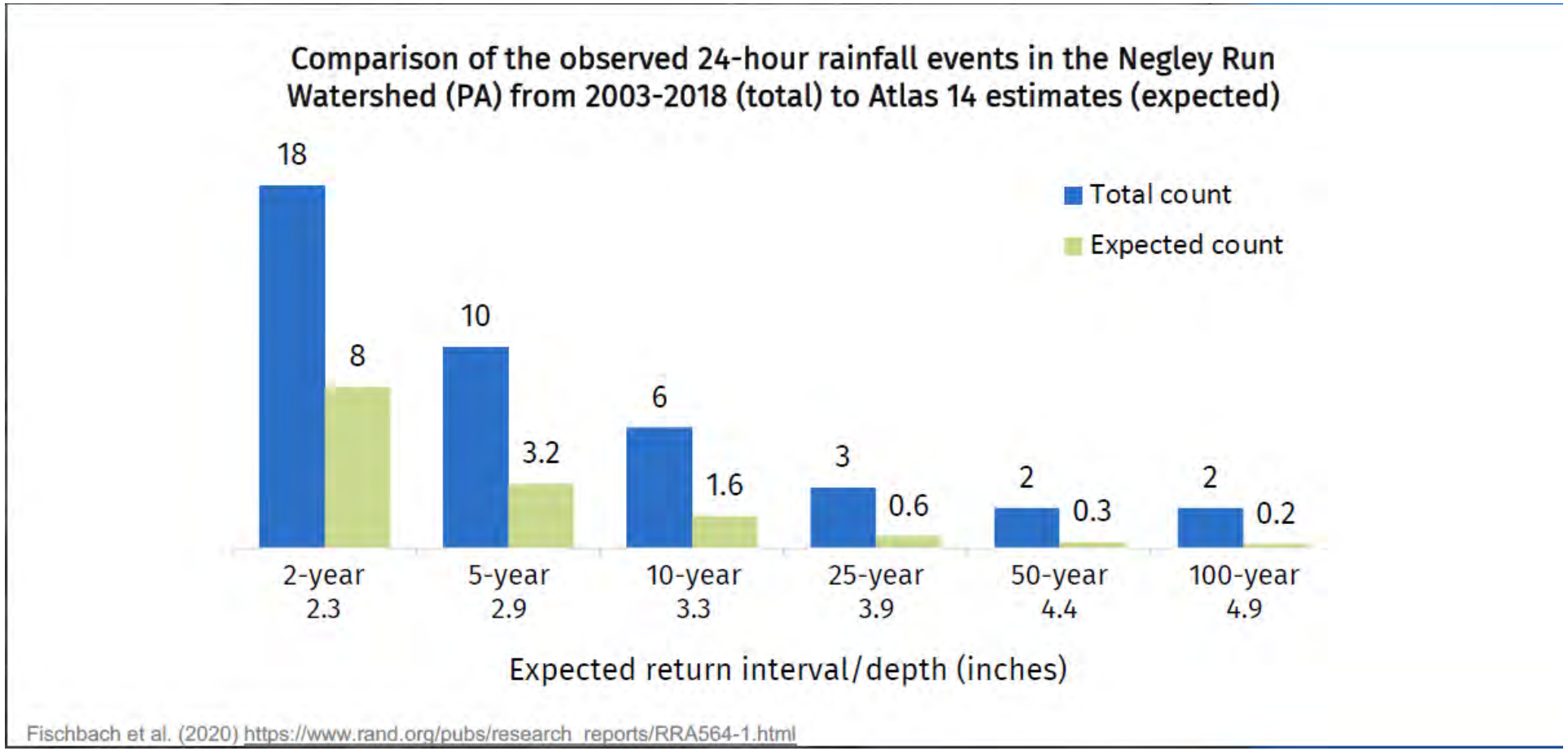
<u>In 30 years, Bioretentions will see:</u>

- Shifting vegetation palettes
- More sediment mobilization in CDA
- Additional rainfall volume in similar # of events
- Rising water tables in coastal areas
- Unknown impacts on pollutant removal efficiency

How comfortable are you with the quality and utility of engineering design criteria on future rainfall intensity provided to you by state and/or federal authorities in your community? (n=133)



ATLAS 14 VS OBSERVED

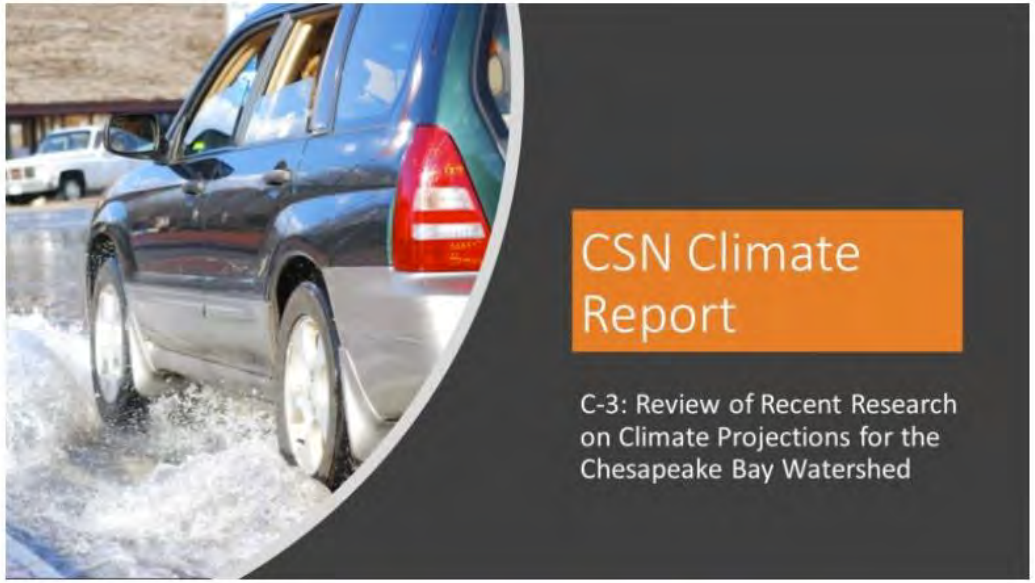


Fischbach et al. (2020) https://www.rand.org/pubs/research_reports/RRA564-1.html

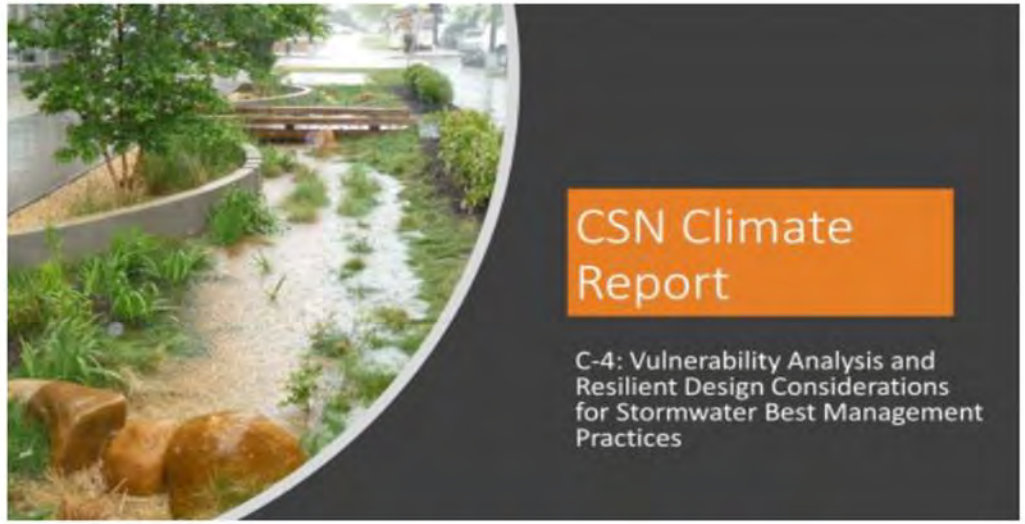
SYNTHESIS OF CLIMATE IMPACTS ON STORMWATER BMPS AND RESTORATION PRACTICES

SYNTHESIS OF CLIMATE IMPACTS ON STORMWATER PRACTICES

- **Reports & Fact Sheets:** https://chesapeakestormwater.net/climate-change-and-stormwater-management/
- **Webinar:** https://chesapeakestormwater.net/events/bmp_vunerability_resilience/

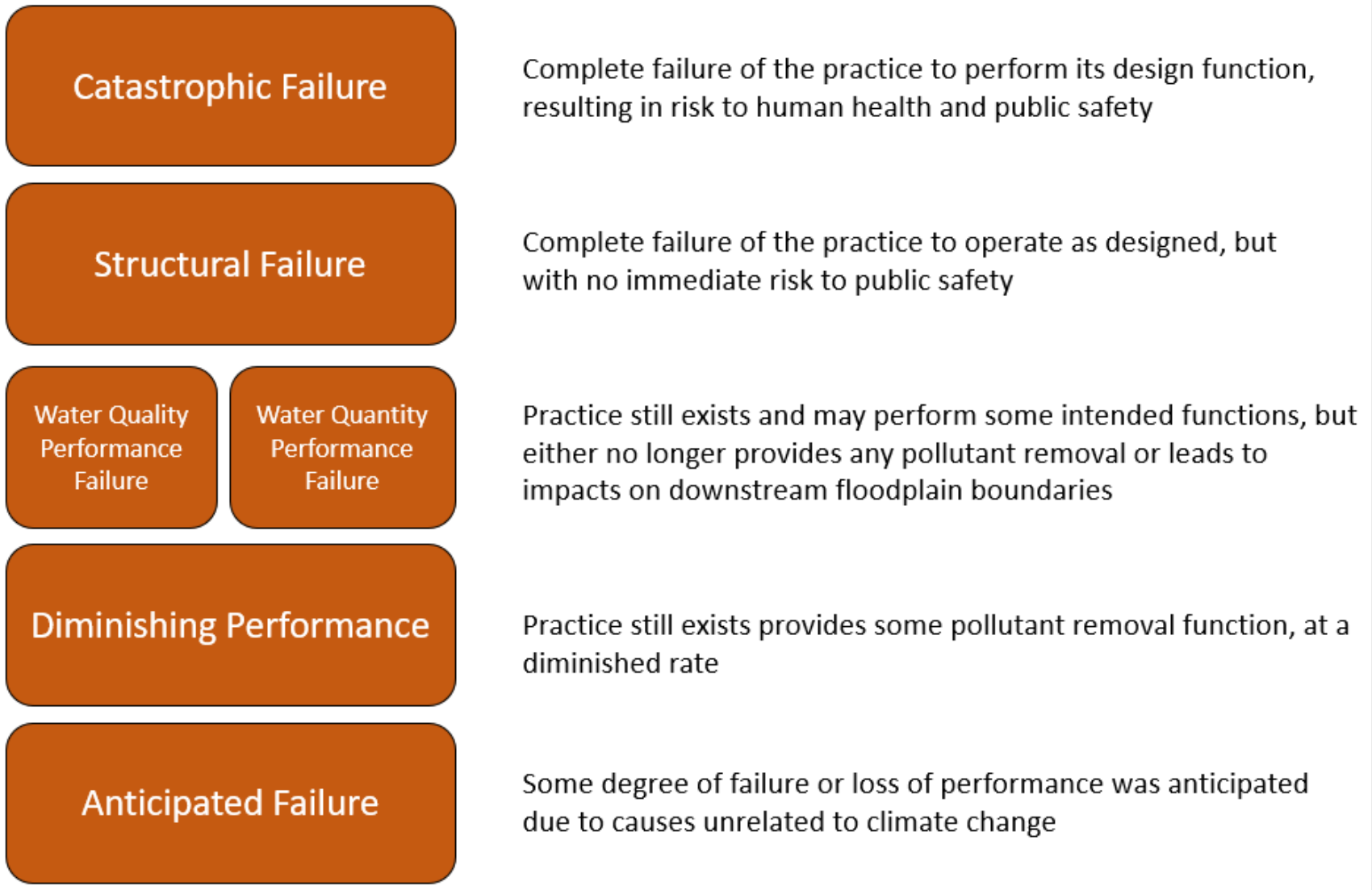


C-3: Synthesis of Chesapeake Bay Climate Projections



C-4: BMP Vulnerability Analysis and Resilient Design Considerations

Memo 4: Urban BMP Risk and Vulnerability



Key Factors:

Age

Location in the Watershed

Maintenance/Design Condition

UPLAND LID PRACTICES

- Maintenance "needy",
- Primarily designed for water quality

- Vulnerabilities:
  - Erosion (in and out)
  - Bypass/Overflow
  - Clogged Filter Media
  - Distressed Vegetation

WATER QUALITY PERFORMANCE IMPACTS

- Data are very limited
- Focus largely on bypass and maintenance losses

Table 1. Summary of Select Climate Change Pollutant Removal Impact Studies

Citation	Type of Study	BMP	Performance Metric	Change in Performance
Hathaway et al., 2014	Modeled	Bioretention (online)	Overflow volume	70-136% increase in overflow volume by 2055
Catalano de Souza et al., 2016	Field (extreme weather as proxy for climate change)	Bioretention (offline)	Bypass volume	40% bypass during extreme events vs 23% bypass during non-extreme events
Butcher, 2020	Modeled	Bioretention	Overflow volume	11% increase in overflow volume by 2055
Alamdari et al., 2020	Modeled	Mixed	BMP removal efficiency	6-11% decline (TSS) 7-12% decline (TN) 11-17% decline (TP)
U.S. EPA, 2018	Modeled	Mixed	BMP removal efficiency	0-10% decline (TSS) 0-6% decline (TN) 0-5% decline (TP)

CLIMATE CHANGE-INFORMED IDF CURVES

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Funders:

CBTRUST
Chesapeake Bay Trust

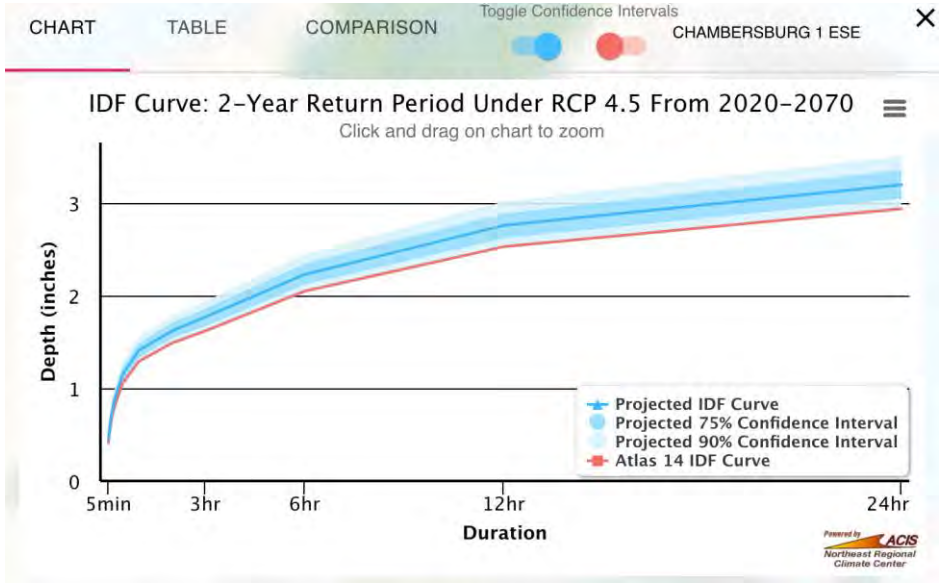
Chesapeake Bay Program
Science. Restoration. Partnership.

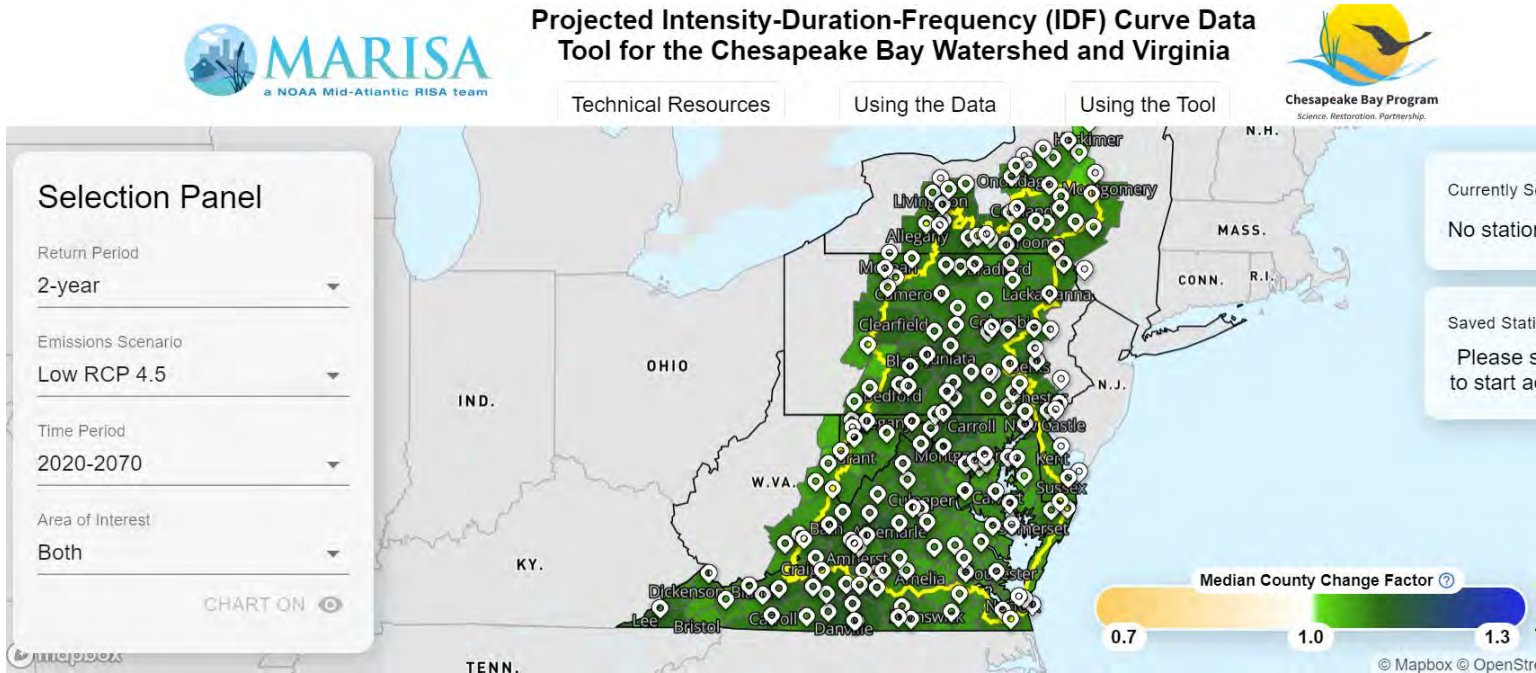
VTRC
Virginia Transportation
Research Council

CCRFR

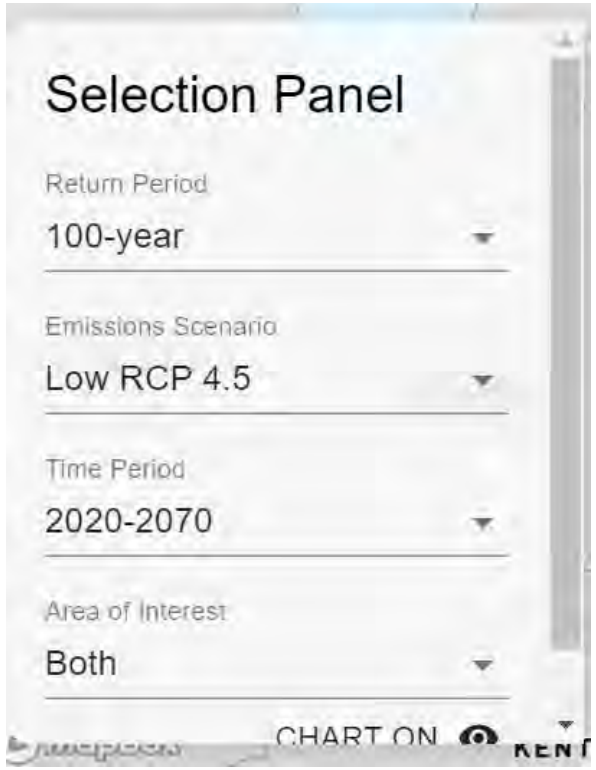
CLIMATE CHANGE-INFORMED IDF CURVES

- Data Tool: https://midatlantic-idf.rcc-acis.org/
- Webinar: https://chesapeakestormwater.net/events/projected-chesapeake-idf-curves/





GRAPPLING WITH LOCAL DECISIONS BASED ON DATA



York Co. PA – 100-year, RCP 4.5, 2020-2070

Percentile	10th	25th	Median	75th	90th
County Change Factors:	0.91	0.99	1.1	1.29	1.47

York Co. PA – 100-year, RCP 8.5, 2050-2100

Percentile	10th	25th	Median	75th	90th
County Change Factors:	0.96	1.0775	1.22	1.42	1.7

Helping Communities Implement the Tools

- Adopt the projected IDF curve?
- Use a factor of safety?
- How do we handle uncertainty?
- What about emissions scenarios?
- Do we handle different assets differently?

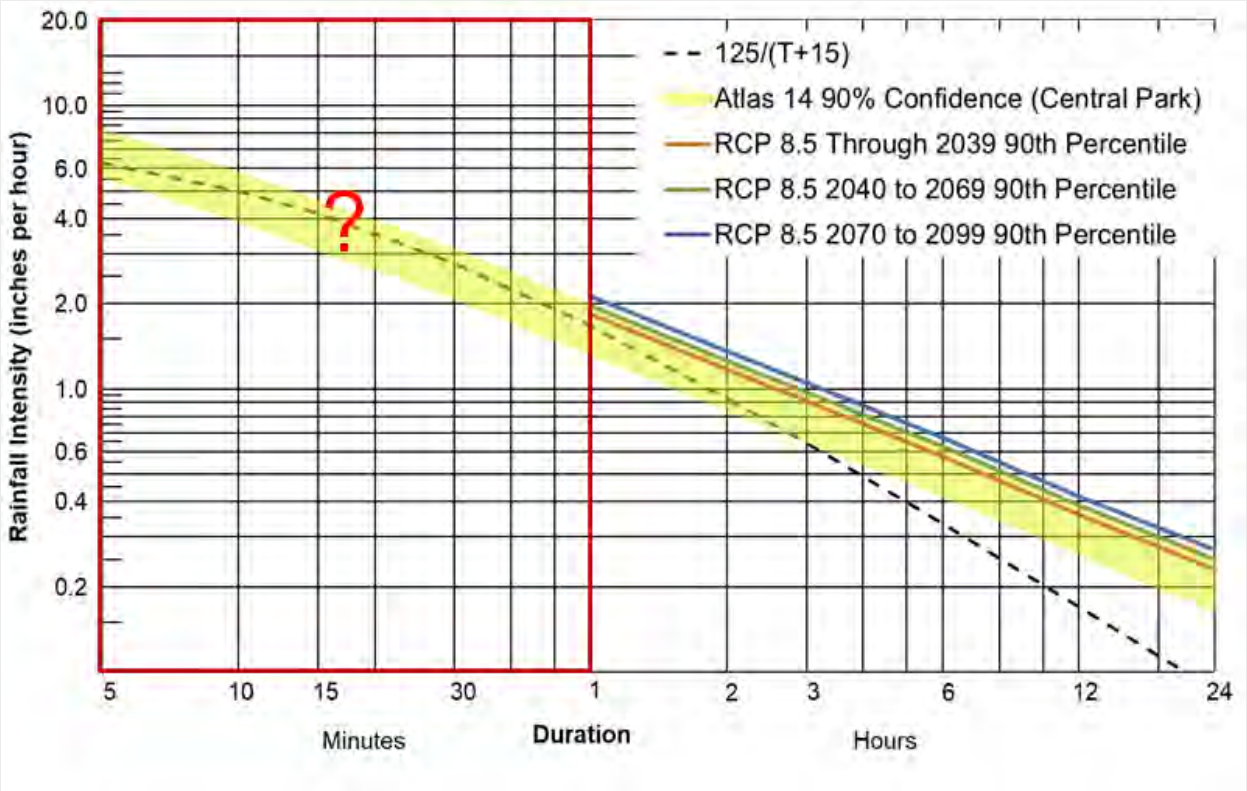


Image: Alan Cohn, NYC DEP

SUPPORTING ADOPTION AND IMPLEMENTATION

- New Maryland legislation requiring MDE to update stormwater regulations every 5 years with "most recent precipitation data available"
- Hampton Roads Planning District Commission considering PDC-wide guidance on use of projected-IDF curves
- Adoption of 20% factor of safety approach in Virginia Beach, and for limited cases in VDOT and NYSDOT

LOCAL VULNERABILITY ASSESSMENTS

Two pronged-approach:

- Desktop assessment for evaluating flood risks in communities, and to municipal assets
- Local codes and ordinance review to reduce future vulnerabilities

Prioritize local adaptability and climate justice

MENU OF RESILIENT DESIGN ADAPTATIONS

It’s more than just sizing criteria:

- Improved “plumbing” techniques
- better understanding of techniques for enhanced runoff reduction, including soil amendments and smart BMPs
- More guidance is needed on proper construction and maintenance of practices

QUESTIONS?

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