Introduction to the PPAT and the Charge from the Chesapeake Bay Program

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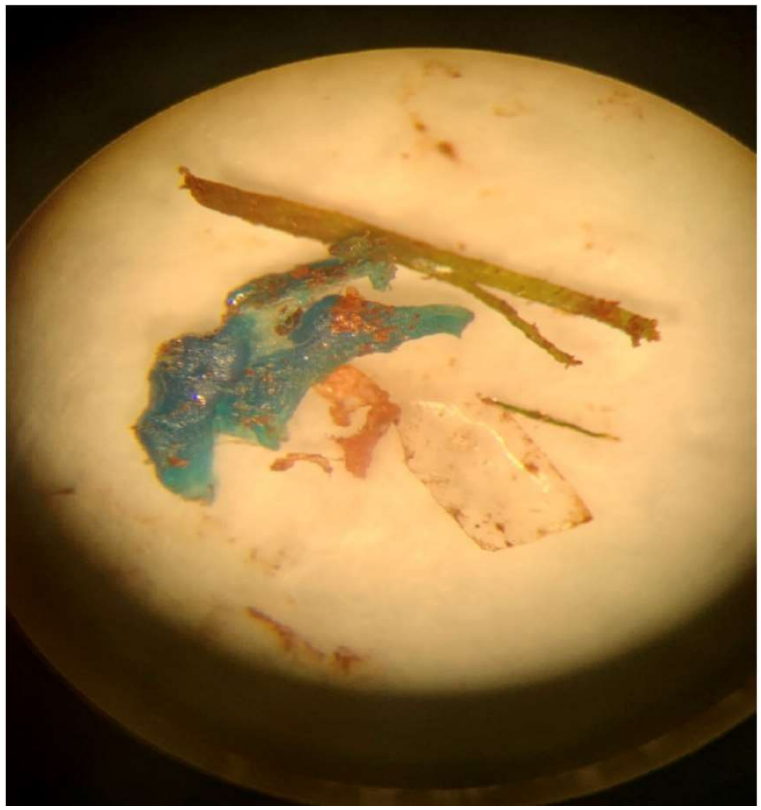
Chesapeake Bay Program
Science. Restoration. Partnership.

DEPARTMENT OF ENERGY & ENVIRONMENT

WE ARE WASHINGTON DC
GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Presentation Outline



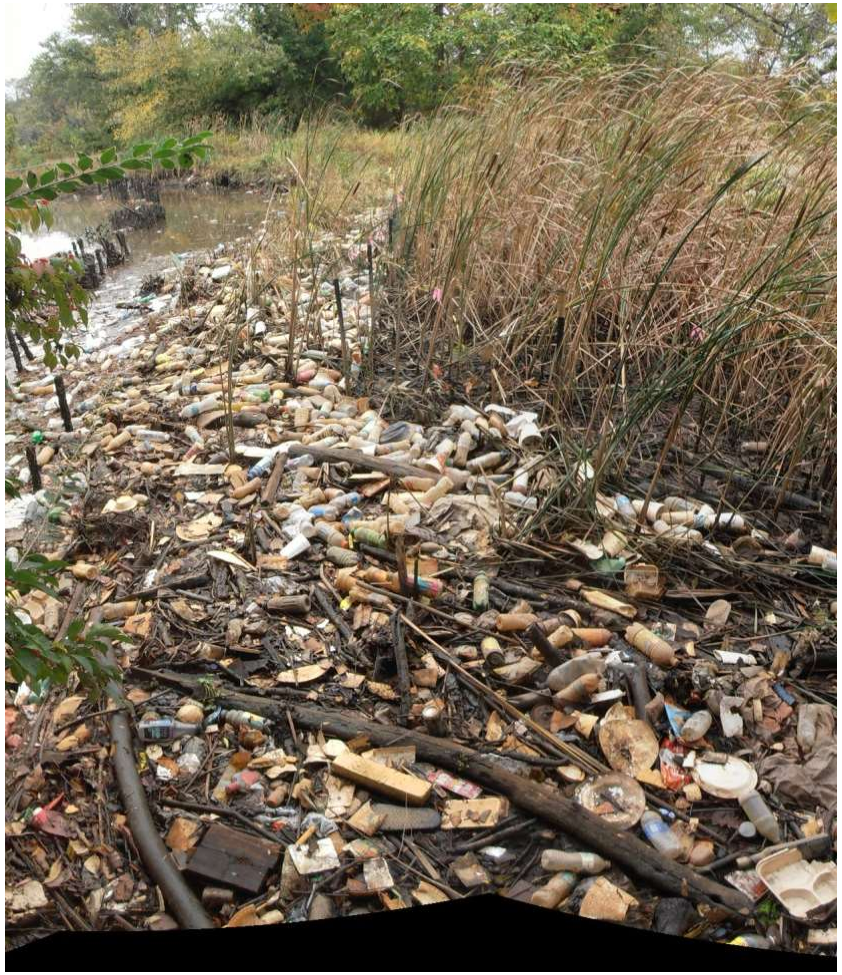
Microplastics collected from SAV beds in the Anacostia River, Washington, DC

1. Background on Inspiration for DC's Efforts to Address Plastic Pollution

2. Overview of the 2019 CBP Scientific and Technical Advisory Committee Workshop on Microplastics in the Chesapeake Bay and its Watershed

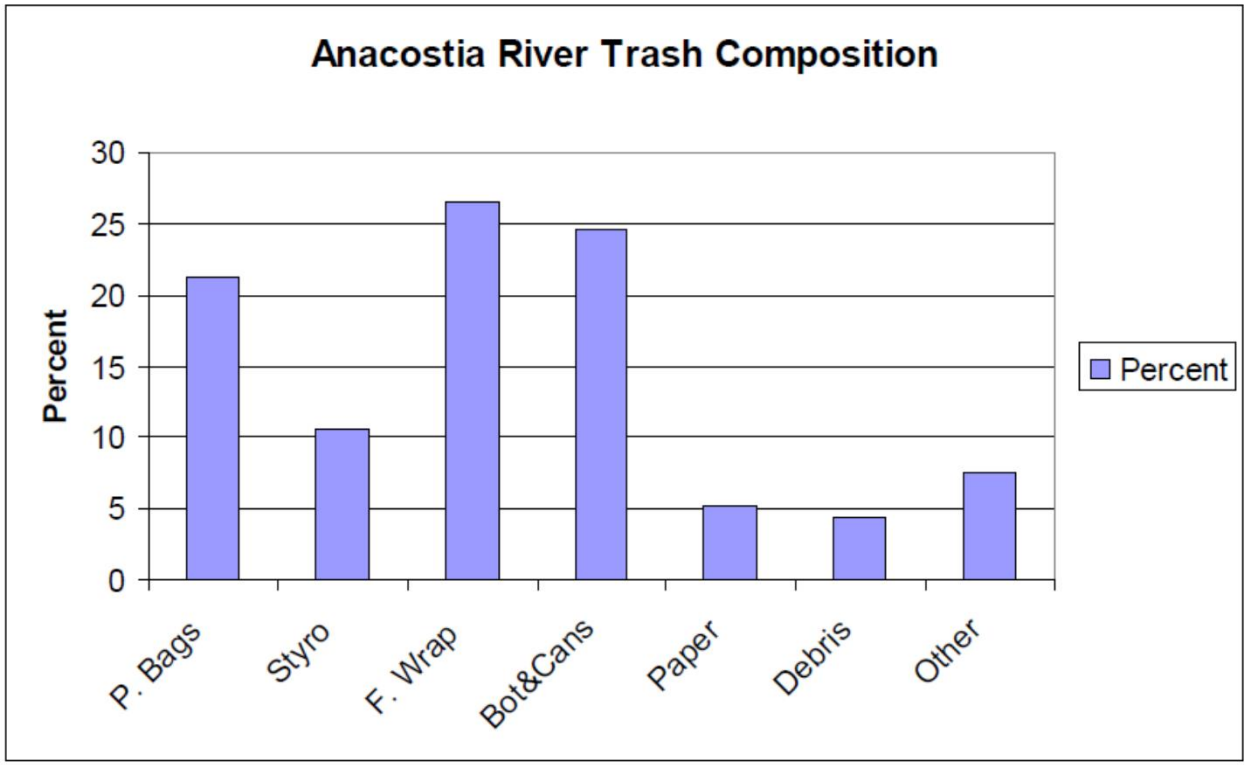
3. Overview of the PPAT Charge from the CBP Management Board

Anacostia River Trash TMDL



- Established in 2010 and shared with DC and Maryland
- Assigns loads to local MS4, Combined Sewer Systems, and Non-Point Source (illegal dumping).
- District's total annual reduction obligation = 217,048 lbs
- Addresses trash ≥ 1 inch in length or diameter

Trash Composition in the Anacostia River



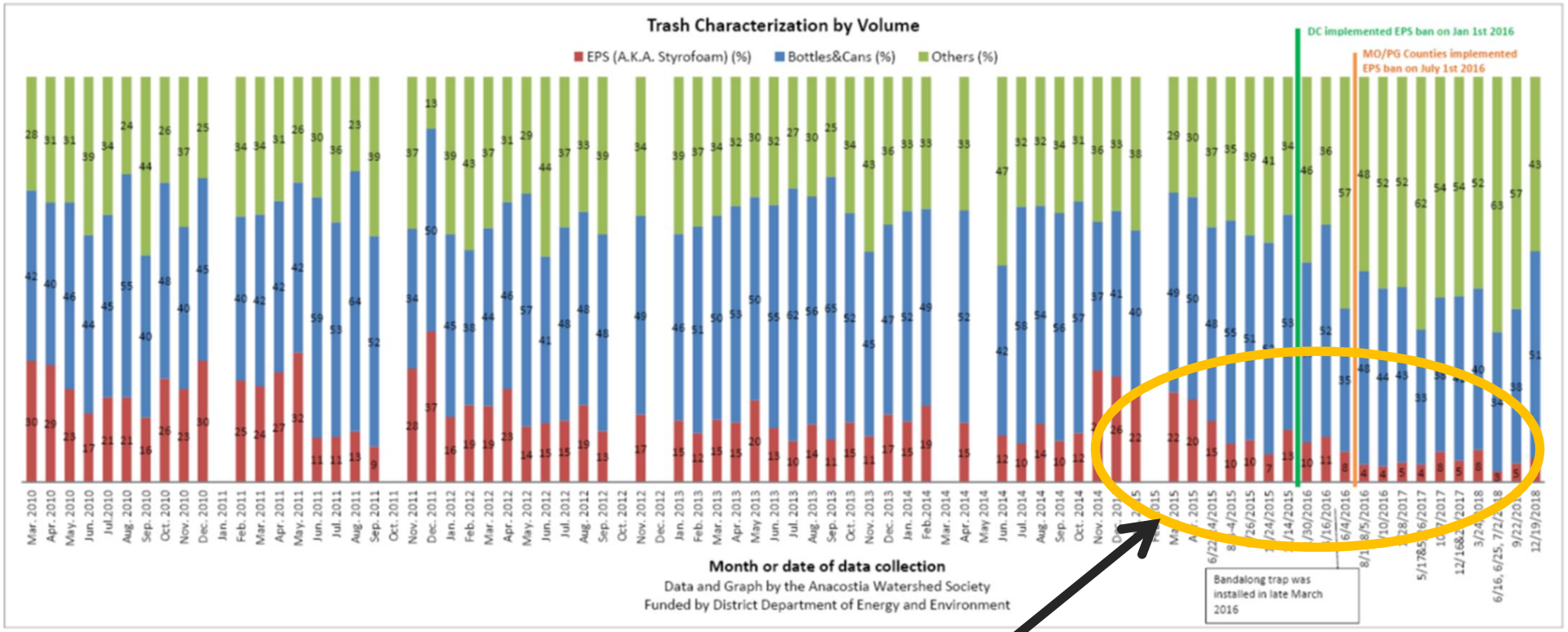
Results from 2008 Study of Trash Conditions in the Anacostia River (Anacostia Watershed Society and DOEE, 2008).

For complete copy of the study go to: https://doee.dc.gov/publication/2008-anacostia-river-trash-study

Implementation of the TMDL

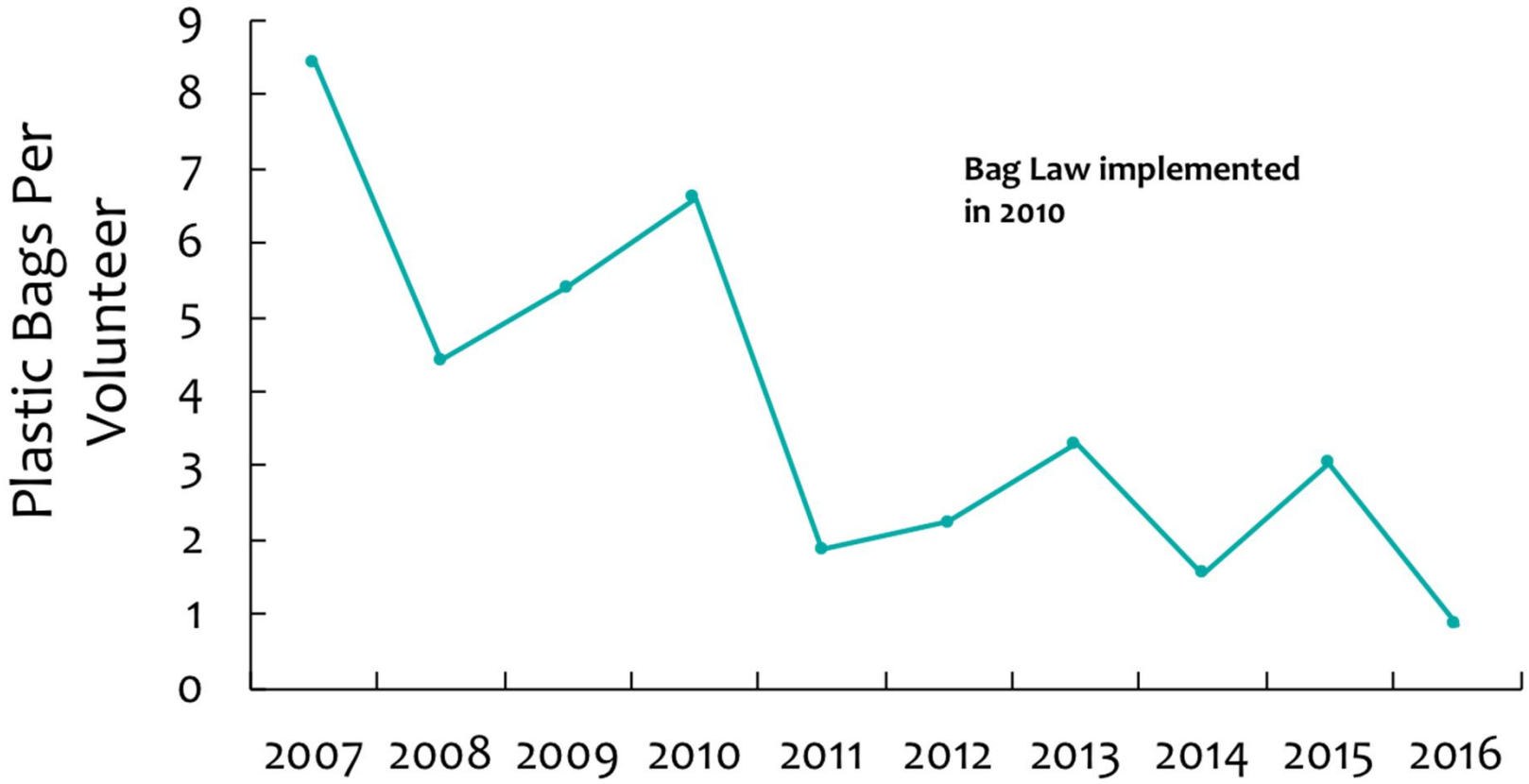
- Use a variety of structural and non-structural controls
- Examples of Structural Controls:
  - Trash Traps
  - Skimmer Boats
- Examples of non-structural controls:
  - Innovative Policies (e.g. Bag Law)
  - Enforcement
  - Clean Teams
  - Trash Free Potomac Watershed Anti-Littering Campaign
  - Street sweeping environmental hotspots

Evidence of Progress – Nash Run Trash Trap



Evidence of declining trend in volume of foam found in Nash Run Trash Trap

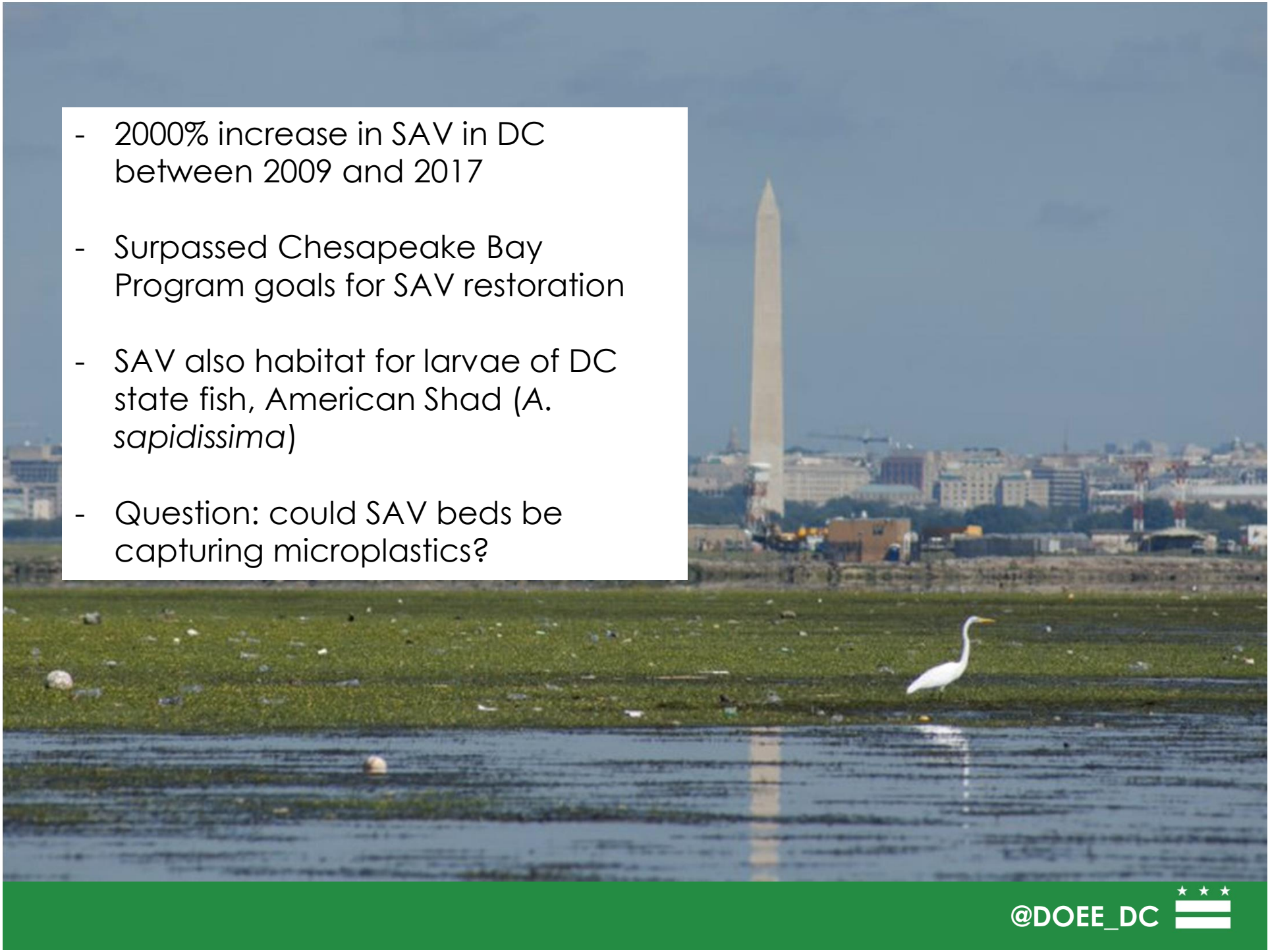
EVIDENCE OF PROGRESS



Number of plastic retail bags seen per volunteer at trash cleanups in DC since before and after passage of the Bag Law – Data courtesy of Alice Ferguson Foundation, 2017

What about the small stuff?
Evidence of Microplastics in the Anacostia River

Photos by Masaya Maeda, Anacostia Watershed Society, 2017



- 2000% increase in SAV in DC between 2009 and 2017
- Surpassed Chesapeake Bay Program goals for SAV restoration
- SAV also habitat for larvae of DC state fish, American Shad (*A. sapidissima*)
- Question: could SAV beds be capturing microplastics?

Study of Microplastics in SAV Beds in DC

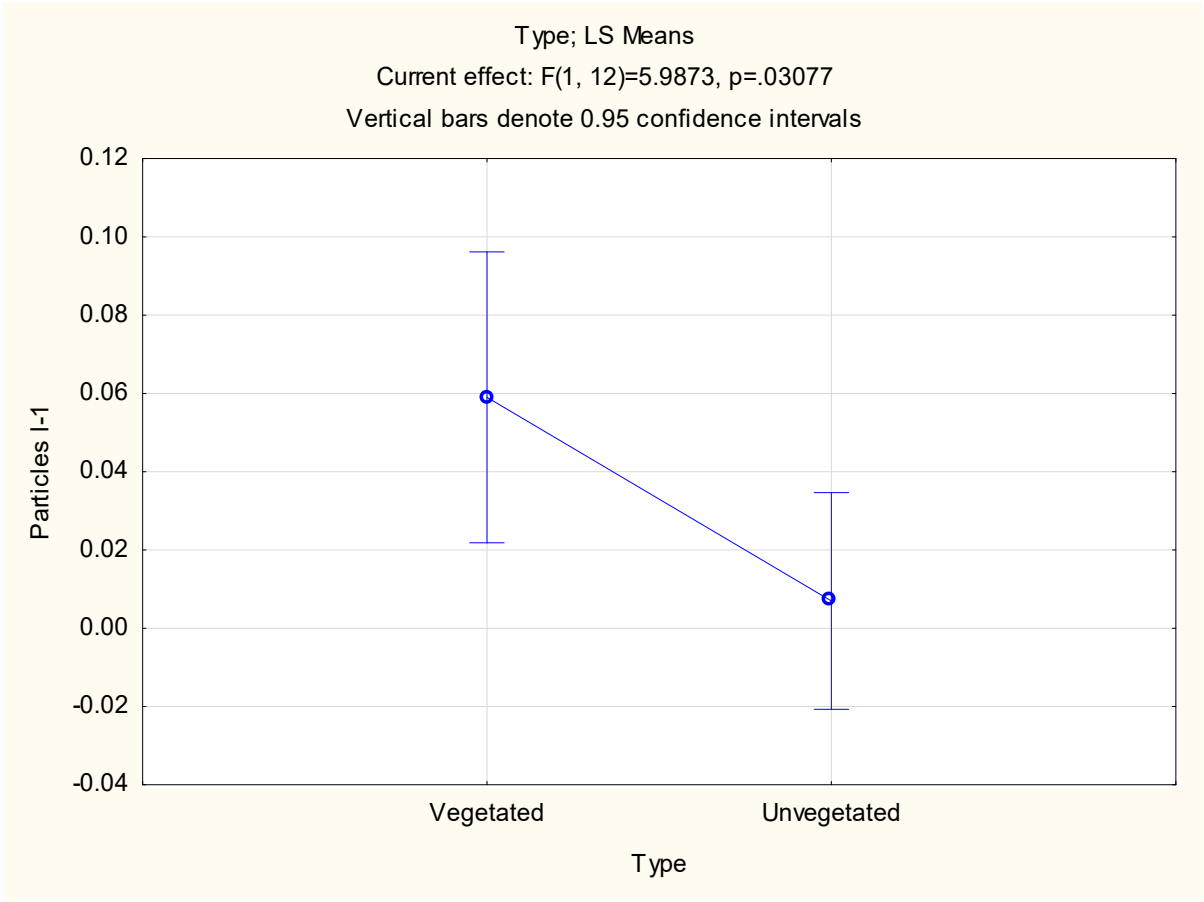
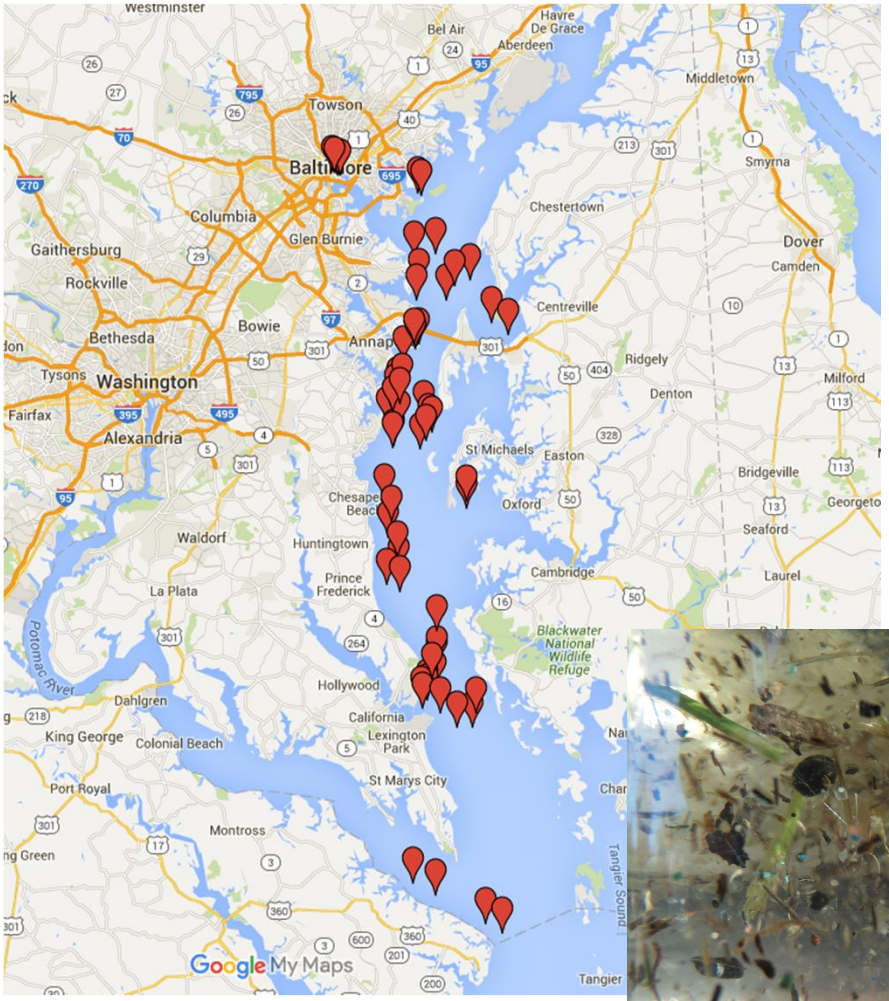
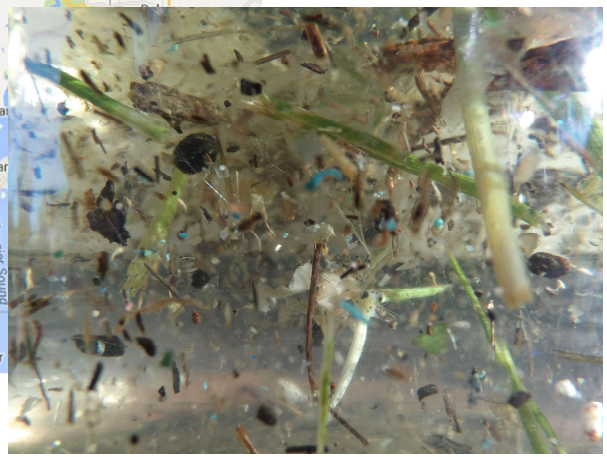


Figure 1 – Mean microplastic particle concentration (#of particles/volume of sample) in vegetated beds vs. unvegetated beds (n=14, 5 vegetated, 9 unvegetated)

Evidence of Microplastics in Chesapeake Bay



- 2014-2015 Bay Trash Trawl conducted by Trash Free Maryland surveyed 30 sites for microplastics in the Chesapeake Bay mainstem and tidal tributaries.
- 100% of samples contained microplastics.
- Highest concentrations found in urban and suburban tributaries.

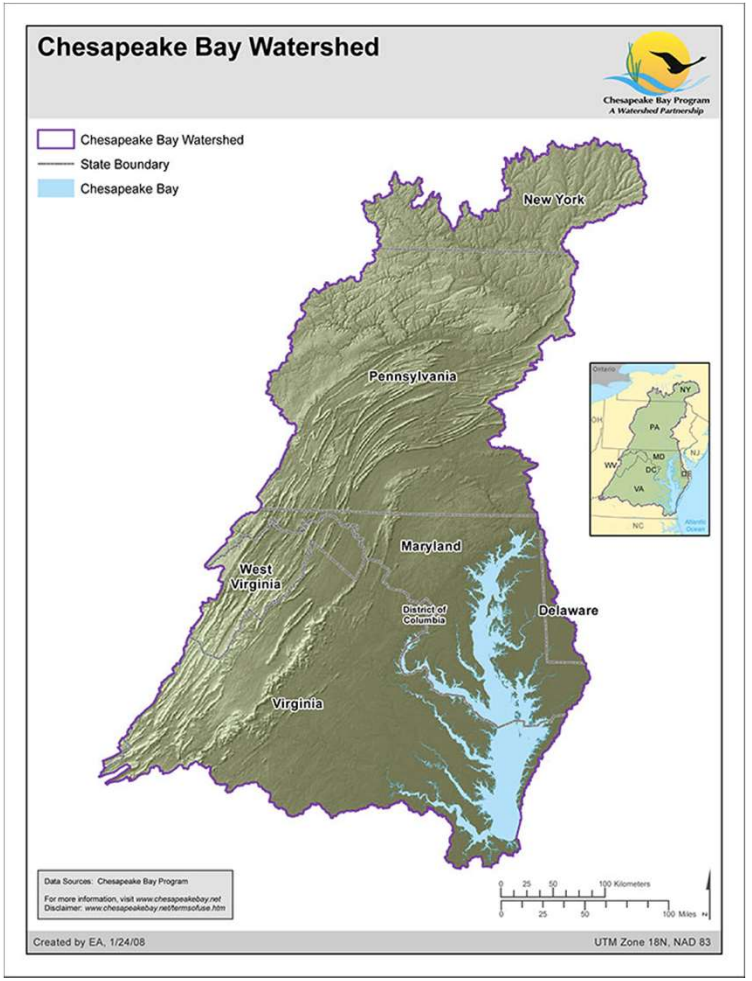


Photos courtesy of Julie Lawson and Trash Free Maryland, 2015

Bringing the Issue to Light

- How can we bring more attention to this issue regionally?

- The CBP's SAV Workgroup applied for a Scientific & Technical Advisory Committee (STAC) funding to hold a workshop in 2019 about microplastics in the Bay and watershed



Workshop Goals

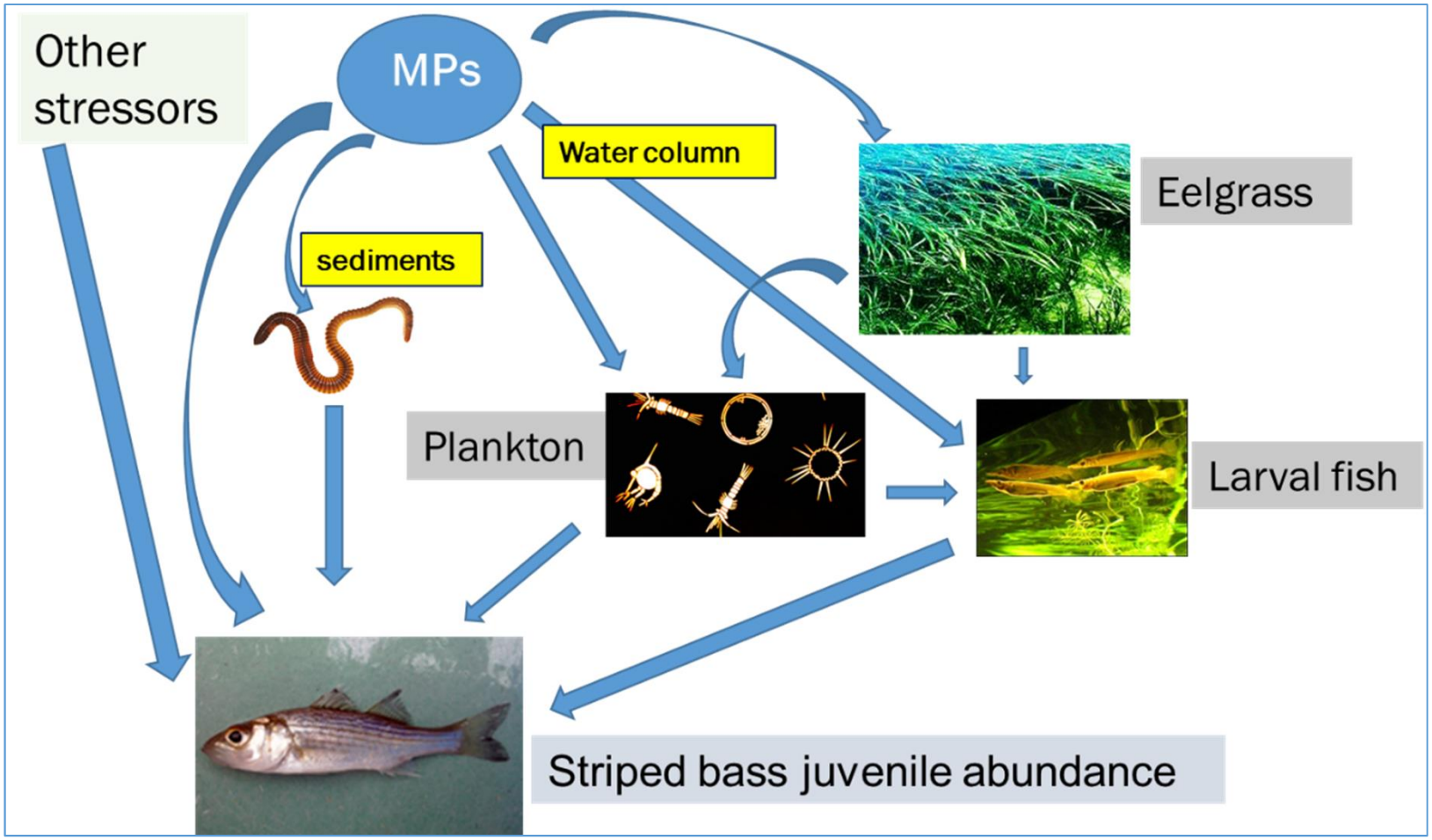
1. Assess the state of the knowledge on microplastic pollution in the Chesapeake Bay and its tributaries

2. Assess possible effects of microplastics on various habitats and associated living resources

3. Identify existing policy and management tools being used to address plastic pollution in the watershed and beyond, and their effectiveness

4. Identify research gaps moving forward, and develop recommendations for future studies or new tools

Example of an Ecological Risk Assessment



Courtesy of Bob Murphy, 2019

Conclusions

- Studies have shown microplastics are fairly ubiquitous throughout the bay and its tributaries. They have been found in both tidal (Yonkos, 2014; Rochman, 2019) and non-tidal waters (Fisher, 2019).

- There is general agreement that plastics represent a widespread, but largely unquantified, threat to the Chesapeake Bay ecosystem.

- Need standardization of terminology

- There are a number of piecemeal efforts to monitor plastics in the Bay, but no systematic effort and no organized effort directed at micro- and nano-plastics.

- **The MOST URGENT need is to identify assessment endpoints that represent areas of environmental and human health concern and to characterize the severity of those risks.**

Recommendations

1. The CBP should create a cross-GIT Plastic Pollution Action Team to address the growing threat of plastic pollution to the bay and watershed.

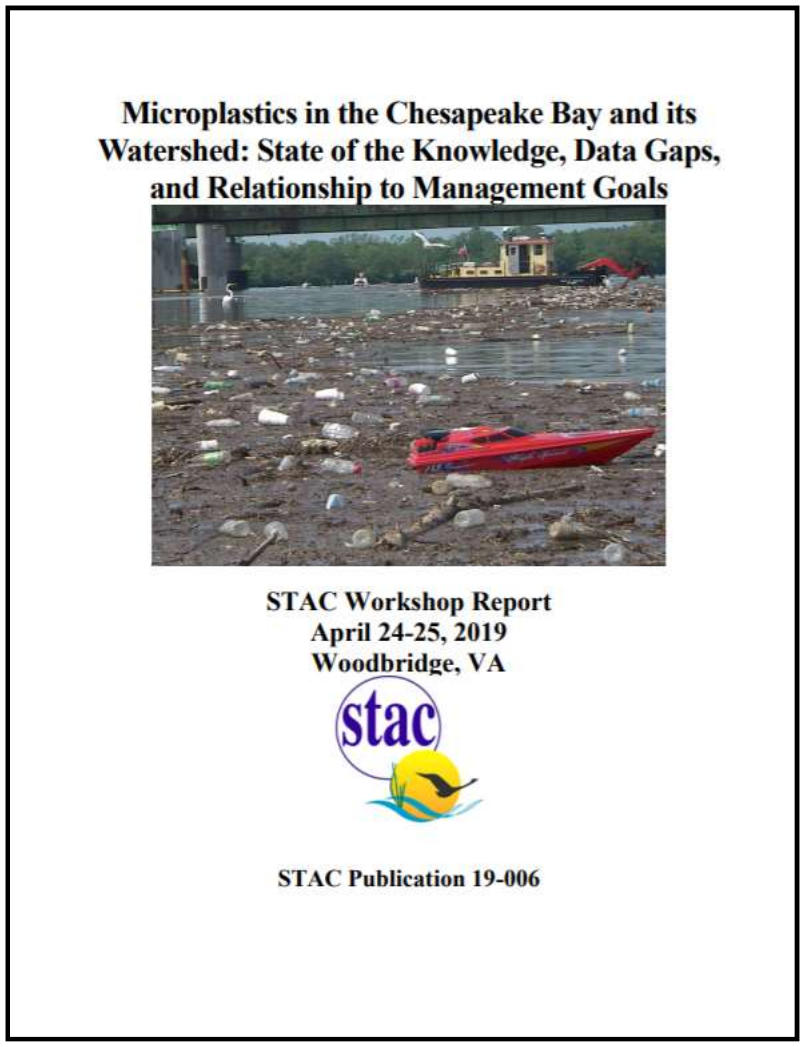
2. The Scientific, Technical Assessment and Reporting Team should incorporate development of ERAs of microplastics into the CBP strategic science and research framework, and the Plastic Pollution Action Team should oversee the development of the ERAs focused on assessment of microplastic pollution on multiple living resource endpoints.

3. STAC should undertake a technical review of terminology used in microplastic research, specifically size classification and concentration units, and recommend uniform terminology for the CBP partners to utilize in monitoring and studies focused on plastic pollution in the bay and watershed.

4. The CBP should develop a source reduction strategy to assess and address plastic pollution emanating from point sources, non-point sources, and human behavior.

5. The CBP should direct the Plastic Pollution Action Team and STAR Team to collaborate on utilizing the existing bay and watershed monitoring networks to monitor for microplastic pollution.

STAC Report



For a full copy of the STAC report please go to: https://www.chesapeakebay.net/documents/FINAL_STAC-Report_Microplastics-1.pdf

Charge from the CBP Management Board

- In November 2019, the CBP Management Board approved creation of a Plastic Pollution Action Team to address recommendations in the STAC report.
- The focus → get the science straight.
- An ecological risk assessment will help us do that. It will help contextualize the problem of plastic pollution in the Chesapeake Bay and its watershed.
- For example, how much plastic is too much plastic before we start to see a negative ecological response? How do we define the threshold (e.g. effects on a species)?
- The focus of the PPAT will be development of an ERA for the Potomac River focused on one ecosystem endpoint. The Potomac River is an appropriate scale waterbody to focus on given the available resources.
- DC has agreed to champion this issue and chair the PPAT.

Charge from the CBP Management Board

1) Provide oversight of the development of preliminary ecological risk assessments of microplastics for one or more subwatersheds to the Chesapeake Bay (e.g. Potomac).

2) Use the components and results of the preliminary ERAs to develop a strategy that identifies and if possible, prioritizes gaps in information concerning the effects of microplastics pollution on the Chesapeake Bay ecosystem, and highlights future research questions that need to be answered.

3) Present results from ecological risk assessments to the MB in order to guide future action on addressing plastic pollution.

4) Monitor policy advances at the state and federal level that could potentially impact, advance, or complement this work to inform the science strategy and to identify potential policy or management options that could be utilized for source reduction strategies.

Charge from the CBP Management Board

Timeline:

- The planned timeline for the PPAT to undertake the charge will be two years.
- The first year will focus on development of the preliminary ERA and science strategy. This work is being funded by the EPA Trash Free Waters Program.
- The second year will focus on implementation of the science strategy.
- ERAs are iterative. As new information becomes available then the Potomac River ERA may be updated.

Special Thanks

Bob Murphy, Tetra Tech

Brooke Landry (MD DNR), CBP SAV Workgroup Chair and workshop sponsor.

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