TETRA TECH

Developing a Microplastic Monitoring Framework for the Chesapeake Bay Watershed

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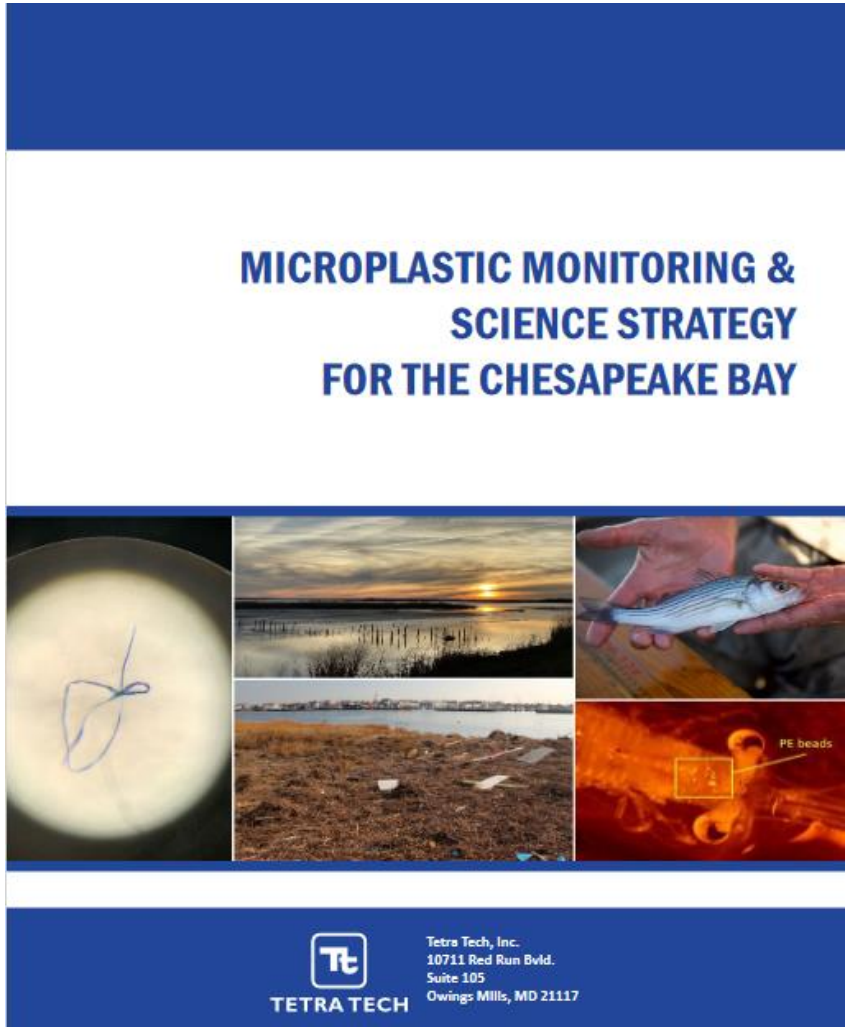
PPAT

Microplastic Monitoring in the Chesapeake Bay



2021

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1. Design and implement a microplastic monitoring program, integrated into the existing Chesapeake Bay watershed monitoring framework;

2. Support research to understand microplastic pathways in the Bay, including trophic pathways that may affect living resources such as Striped Bass, Blue Crabs, Oysters, and other species critical to the Bay ecosystem;

3. Ensure adequate infrastructure resources are available to process microplastic samples, including analytical equipment; and

4. Continue to support the PPAT in order to direct research, management, and policy development"

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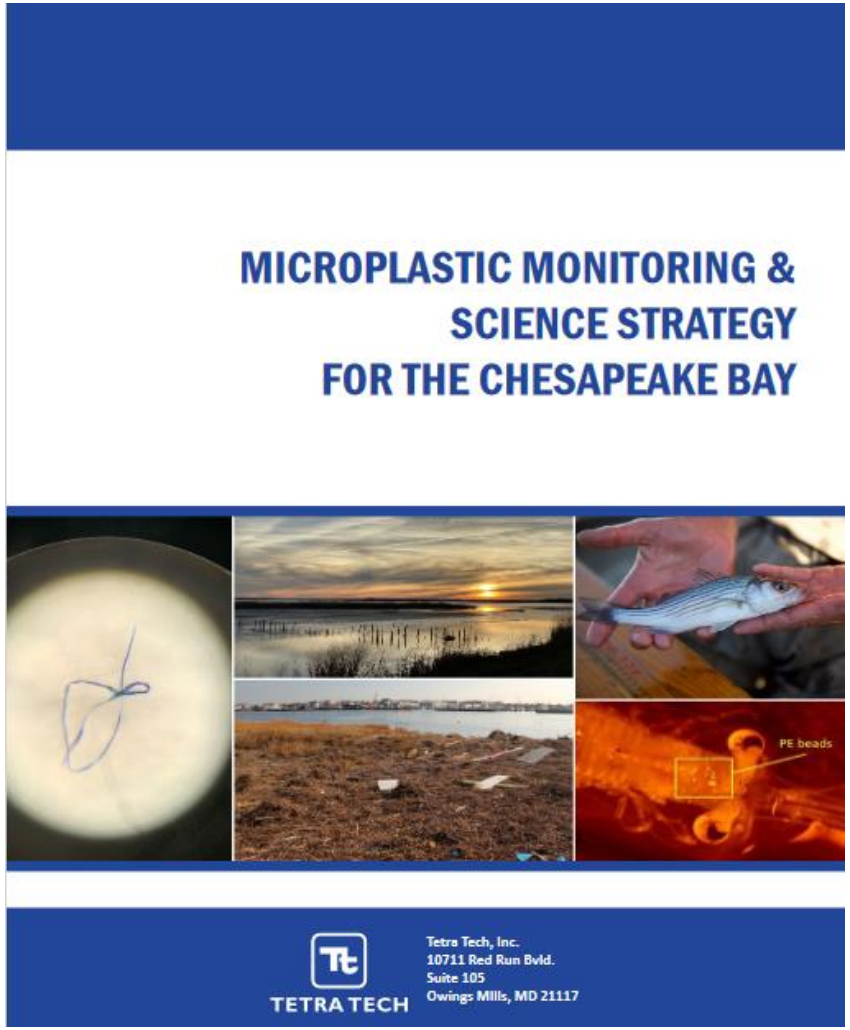

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Development of Reference Guides

- Reference guides for two categories
  - Sampling methodologies
  - Analytical methodologies
- Literature Review
  - Sampling methodologies
    - Tidal (sediments, water, living resources, various habitat types)
  - Laboratory
    - Extraction techniques (including dissection where pertinent), isolation, identification, polymer analysis

Development of Reference Guides

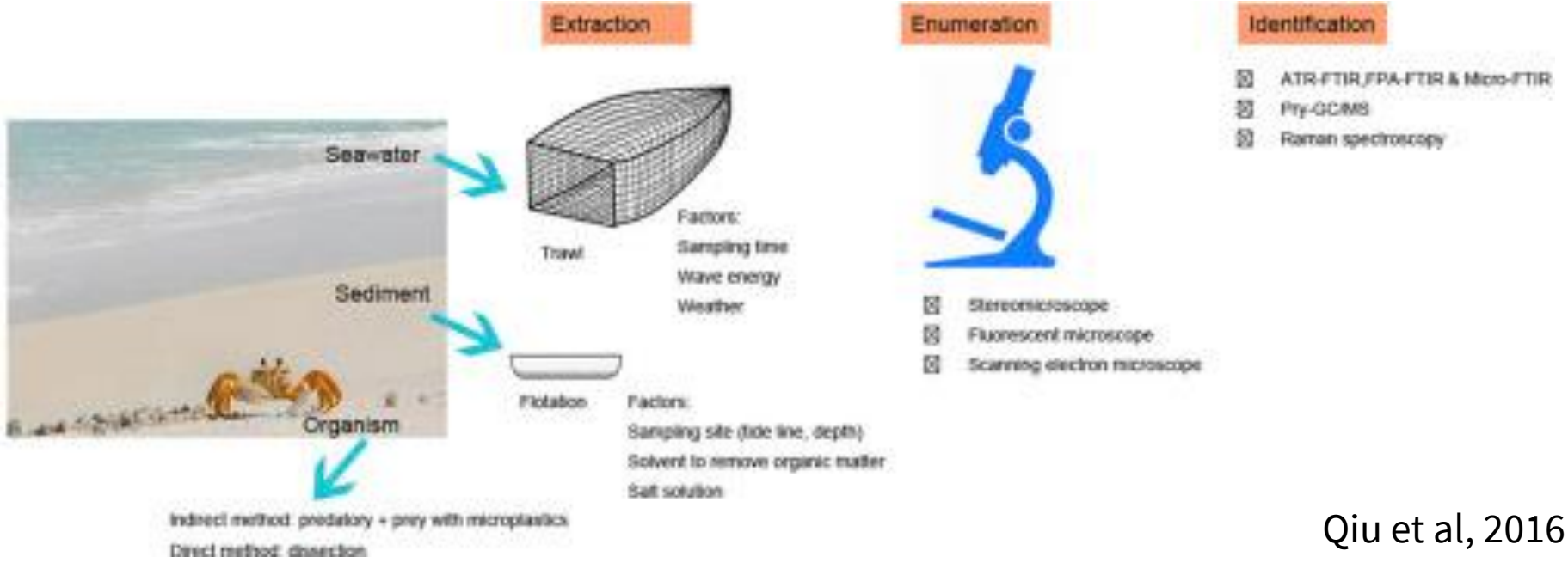
- Guides are designed to be best professional practices
- Follow most recent guidelines
  - Exception is where recent research may update/refine methodology
  - Employ “Uniform Size Classification and Concentration Unit Terminology for Broad Application in the Chesapeake Bay Watershed”

Monitoring Framework

- Building off Monitoring matrix
  - Questions guiding monitoring goals
    1. What is the current status (i.e., concentrations) of plastic pollution in tidal and nontidal waters of Chesapeake Bay and its watershed?
    2. What is the spatial distribution of plastic pollution in the Chesapeake Bay and watershed?
    3. What are the sources (i.e. plastic product) of plastics found in the bay and watershed?
    4. What are the pathways (i.e. stormwater, wastewater, non-point source) of plastics for the bay and its watershed?
    5. What is the range of concentrations for plastic pollution within the food web, focusing on species identified in the Chesapeake Bay 2014 Watershed Agreement Goals and Outcomes (e.g. blue crabs, oysters, brook trout) as well as other species of commercial and/or recreational importance (e.g. striped bass)?

Monitoring Framework

- The goal of the framework is to make recommendations on monitoring strategies across various media such as surface water, stormwater, key living resources, and sediment as well as scale, frequency, and locations.
- The framework will include details on approach, methods, frequency, scale, etc.



Qiu et al, 2016

Moving Forward

- Steps Ahead:
  - —Identifying existing monitoring programs
    - Are any including microplastics (e.g. Prince Georges County)
  - —Within programs, geographic coverage
  - —How do existing programs tie into questions and goals already discussed

PPAT's Role

- PPAT's mission is to provide oversight on plastic pollution actions undertaken thru CBP (e.g. Size/Unit Classifications, Risk Assessmnent Model Development, etc)

- PPAT to help identify priority and preferred sampling and analytical methods for broad application throughout the Chesapeake Bay and its watershed

Timeline

Literature Review	Date
A literature review inventory in the form of a report or a spreadsheet on Plastic Pollution Sampling Methods	August 1st, 2023
A literature review inventory in the form of a report or a spreadsheet on Plastic Pollution Analytical Methods	August 1st, 2023
Reference Guide and Framework	
A Final Sampling Reference Guide	Nov 1st, 2023
A Final Analytical Reference Guide	Nov 1st, 2023
A Framework for Monitoring Plastic Pollution in the Chesapeake Bay	June 1st, 2024

Questions & Discussion