

## Smart Management of Microplastic Pollution in the Great Lakes

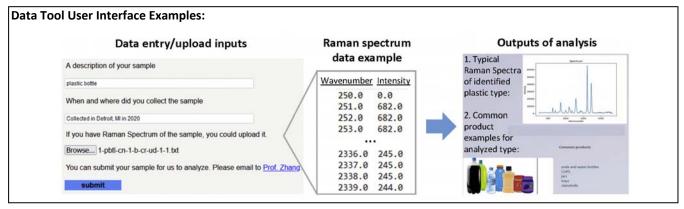


## **5<sup>th</sup> Advisory Board Meeting Notes**

Wednesday, November 1<sup>st</sup>, 2023
At Clinton River Watershed Council Offices

## The objectives for our fifth advisory board meeting included:

- 1. Review and summarize project outputs and lessons learned 2018-2023
  - Community Engagement Reached 108,880 individuals (contact) and engaged 15,996; completed 235 activities including 69 meetings, events and presentations; posted ready-to-use outreach materials at <a href="https://microplastics.wayne.edu/">https://microplastics.wayne.edu/</a> (infographics, school curricula, community action ideas);
  - Green Stormwater Infrastructure (GSI) Tested capture of plastics and microplastics; analysis showed 3000-4500 microplastics particles per dry kg soil in GSI (vs. 390 background) largely from weathering of plastic packaging and tires; results show GSI has potential to keep micro plastics out of waterways;
  - Protocols for microplastics sampling and analysis from different environmental samples including water, wastewater, water filter bed, sludge, and soil Sample pre-processing requirements constrain detection (must minimize organic matter and non-plastic particles).;
- **2.** Learn about the current uses of the project products: sensor technology, data tool, and community outreach and public education materials
  - Microplastics Sensor Fits in a small cabinet transportable via cart (weighs 30 lbs), produced using commercially-available parts costing about \$30,000 (flow pump, filtration, Arduino, LED light, camera, Raman device) + labor, 98% accurate for detection of plastic type from the environment; ongoing testing and improvements for identifying smaller microplastics;
  - Microplastics Data Tool Online tool for uploading Raman spectra; machine learning algorithms identify post-consumer and environmentallyweathered plastic types with 99 % accuracy (for most types); adding more environmental plastics now;



Outreach Materials – For communities and teachers/students at https://microplastics.wayne.edu/

- 3. Develop collaboration framework: Advisory Board discussion and suggestions
  - GSI document co-benefits of microplastics reductions in stormwater for municipalities/regulators;
  - Sensor Field test increasing the flow rate and adapting sensor use in surface waters that contain algae
    and sediment; develop solar power and reduce battery weight for easier use by all; confirm vortex
    removal rate and stratification within water column by plastic type (high and low density) and
    ecosystem; confirm uses for groundwater, drinking water and wastewater testing; add flow rate meter;
    document extent of advantages over grab sampling (weight, volume, representativeness, real-time);
  - Data Tool Enhance user interface to include metadata (sample morphology, collection location, user-defined analytic fields); consider EPA need for Area of Concern monitoring relating to legacy contamination and clean-up.