Smart Management of Microplastic Pollution Newsletter

A research project led by Wayne State University

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Welcome to our second Microplastic newsletter! This newsletter covers major project updates and accomplishments from August 2019 to March 2020. We are grateful to be able to share this newsletter and hope our readers continue to stay safe during the COVID-19 pandemic.

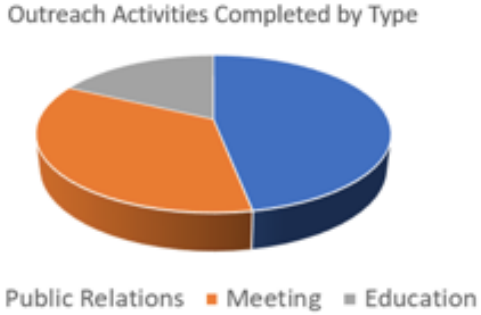
EDUCATION & OUTREACH

New project outreach strategies have been developed with help from Dr. Michelle Najor (Dir. of WSU Undergraduate Public Relations Program) and community team members. WSU PR design teams have developed campaign programs for Pontiac and Williamston. Programs in Williamston will focus on the theme of "Red Cedar River - Heart of Williamston" while in Pontiac, campaign activities will focus on "Economic Incentives – What's in Your Water Bill."

In terms of public education and networking, Kathleen Sexton from the Clinton River Watershed Council spoke with a group of 15 science students at Van Hoosen Middle School that chose to focus on microplastic issues as part

of their school stewardship action plan. In Williamston, the project team supported the Williamston High School InvenTeam, a student led group that is developing an autonomous vehicle that can collect pieces of plastic from beaches. Lastly, in February, WSU hosted a workshop for 60 8th grade STEM girls from Cranbrook High School. The workshop centered around microplastics in different environments. Instructors used hands-on exercises to count plastics on a simulated lake and beach.

To date, the overall project has reached 27, 921 people and engaged nearly 10, 596 people either in person or through social media.



RESEARCH

- Dr. Mark Cheng is working on sensor technology improvements by coupling imaging-based technology and Raman spectroscopy for microplastic detection. Imaging allows for statistical analysis (color, shape, and size) of microplastics while Raman spectroscopy provides chemical analysis. This new prototype is being tested with a combination of microbeads and microfibers. After the sensor prototype is fully developed, it will be evaluated in field with natural water samples from Williamston and Pontiac

- During the period of June to Oct. 2019, Dr. Rahul Mitra and Lacey Brim finished Phase 1 of the focus group study with five groups in Williamston and Pontiac. Phase 1 goals included: (1) understanding how community members in Williamston and Pontiac perceive the risk of microplastic pollution; (2) helping inform the rollout of interventions (e.g. laundry bags in Williamston, green storm water infrastructure in Pontiac); (3) helping inform the design and implementation of sensor technology; and (4) developing a leadership network willing to address microplastic pollution in the region for the long term.

- Dr. Zhang's research group published a research article in the *Science of the Total Environment*: "Removal efficiency of micro- and nanoplastics (180 nm–125 μm) during drinking water treatment." To read the full article: https://authors.elsevier.com/a/1aiU7B8ccoAJ9
- Dr. Donna Kashian's research group published the research article "Microplastic ingestion by quagga mussels, *Dreissena bugensis*, and its effects on physiological processes." in the journal of *Environmental Pollution*. To read the full article: https://doi.org/10.1016/j.envpol.2020.113964

ADVISORY BOARD MEETING RESULTS

WSU and NOAA/GLERL co-hosted the second advisory board meeting on Oct. 2nd, 2019 in Ann Arbor, MI. About 40 participants attended the meeting. To begin, Dr. Deborah Lee discussed research impacts of plastics, and Dr. Zhang covered project updates. This meeting's featured speaker was Sarah Lowe of the Marine Debris Program; she spoke on the impacts and efforts to reduce marine debris across the nation. Feedback from community engagement members included the need to connect with communities on microplastics issues by focusing on affordable and accessible mitigation efforts. Examples include connecting microplastic issues to mainstream topics such as ocean plastics. Sensor technology advice included honing microplastic detection to certain sizes of microplastics to show a proof of concept.

Partnerships

Ingham Conservation District

Reroot Pontiac — Developing Interest in Awesome

CRWC — Clinton River Watershed Council

Project Funding

Great Lakes Protection Fund

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