



# Smart Management of Microplastic Pollution in the Great Lakes

A research project led by Wayne State University



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## Project Goal

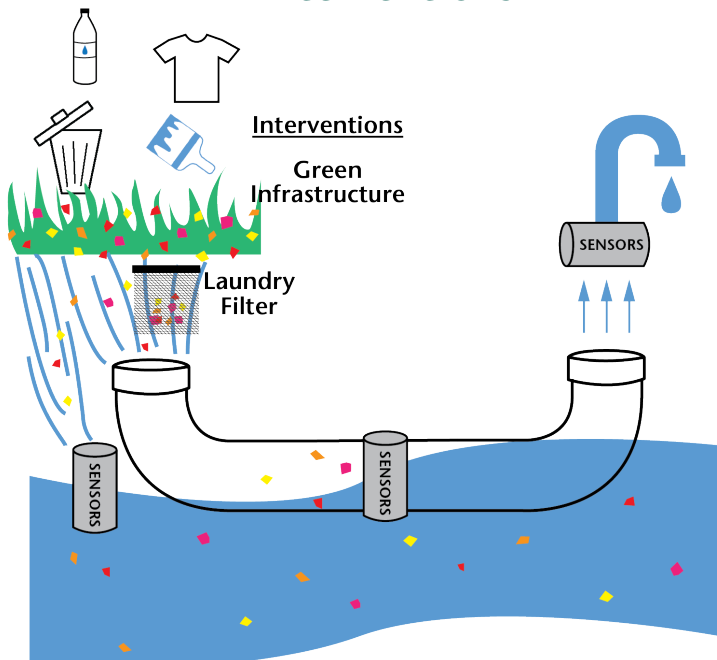
Reduction of microplastics in the Great Lakes ecosystem through:

- A microplastic reduction campaign and mitigation initiative.
- A new sensor technology for microplastics detection monitoring and mitigation.

## Project Objectives and Outcomes

- Develop and test a sensor to detect microplastics coming from wastewater treatment plants and water runoffs from different land uses into receiving waters.
- Partner with Ingham Conservation District to provide mesh laundry bags to the residents of the Williamston community.
- Partner with Reroot Pontiac and the Clinton River Watershed Council to install green infrastructure and to clean up plastic litter.
- Inform and empower community leaders, policy makers, and the public about microplastics pollution in freshwater lakes and rivers, drinking water and combine sewer overflows.

## Microplastics Pathway and Interventions



## General Information

More than half of our waste in the U.S. contains plastic materials. About 10,000 metric tons of plastic enter the Great Lakes every year, and another 8 million goes into the ocean. Over time, larger plastic items break down into much smaller microplastics, such as remnants of water bottles. Soap, toothpaste, paint, and even fibers from clothing generate microplastics. Because of their tiny size, they can easily enter water and food systems.

## What are microplastics?

Microplastics are small plastic pieces (fragments, fibers, beads) less than 5mm in size.

## Where do they come from?

**Primary microplastics:** manufactured to be of microscopic size. These can be found in products such as: cosmetics, glitter, paint, coatings, inks, and abrasives.

**Secondary microplastics:** degraded from larger pieces of plastic, such as bottles, bags, and straws; torn off during wear and tear.

## Where are they found?

### EVERYWHERE!

- oceans
- fresh water lakes, rivers, and groundwater
- drinking water (tap and bottled water)
- food and drinks
- inside of animals, such as fish

## How do they get there?

- Point sources such as wastewater discharge and industrial outputs.
- Non-point sources such as storm water runoff, plastic litter, and emissions during wear and tear.

**FACT:** In the environment, plastic bags exist as long as 20 years, plastic bottles and straws for 450-500 years, and plastic fishing lines for as long as 600 years.



## Prevention

Reducing the source of microplastics by changing individual behavior can prevent microplastics from entering the environment.

- Community leaders, businesses, educators and individuals can advocate for many types of positive change (technology, policy and behavior).
- Public policy may change in response to public action to limit single-use plastics or provide alternatives like biodegradable products. Policies include banning stores from providing plastic bags or restaurants from providing plastic straws.
- Technology innovation may make microplastics obsolete – such as developing new materials and products – or make pollution control easier.

## What can we do in our everyday lives to reduce microplastic pollution?

- Avoid using plastic disposables and single-use plastics.
- Use reusable bags, bottles, and containers
- Recycle!
- Clean up: don't leave waste in the environment.
- Be careful about choosing products that contain or produce microplastics
- Avoid synthetic clothing, use a laundry filter, or wash less frequently

**FACT:** In 2014, California became the first state to pass laws banning single-use plastic bags at large retail stores. This was followed by Hawaii, New York, and the territories of American Samoa, Guam, Northern Mariana Islands, US Virgin Islands, and Puerto Rico.

**FACT:** The Microbead-Free Waters Act of 2015 prohibits the manufacturing, packaging, and distribution of rinse-off cosmetics containing plastic microbeads.



## Partnerships



## Project Funding



Great Lakes  
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