

## **Assessment of microplastics load discharged into Narragansett Bay through wastewater treatment plants**

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### **Project Location:**

Bryant University

### **Project Description:**

Plastics are ubiquitously present in the environment related from food packages, shopping bags, household items such as toothbrushes and pens, and personal care products. The global annual production of plastics exceeds 300 million tons. Plastic debris are exponentially increasing in the environment since their first production about 75 years ago. Microplastics (MP) are plastics that are less than 5 mm or smaller in diameter, and they are formed by degradation of plastic wastes through mechanical and/or photo-oxidative pathways. There are sufficient scientific evidences that MPs are harmful to the aquatic organisms. Furthermore, there is ample scientific evidence that MPs absorb and accumulate high concentrations of toxic organic pollutants and play a vital role in facilitating bioaccumulation of several toxic contaminants.

Narragansett Bay plays a vital role in the economy of the State of Rhode Island. The presence of MPs in the bay as well as the water bodies that drain into the bay region are not well documented. While there are many sources for introduction of MPs into the water bodies, wastewater treatment plants (WWTPs) are considered as one the primary sources of MPs. There are two major WWTPs that discharge their effluent into Narragansett Bay – Field's Point and Bucklin Point. Both the WWTPs are equipped with primary and secondary treatment facilities. The mass of MPs will be monitored in the influent and effluents of primary and secondary treatment facilities. MPs that are collected will be further characterized using FT-IR and pyrolysis GC-MS to determine the chemical composition of MPs. The outcome of this environmental monitoring study will help to assess the amount of MPs load discharged into Narragansett Bay through these two WWTPs.

*This project involves **both field & lab/computer work***

### **Required/preferred skills for student applicant:**

Preference will be given to the students who have taken the following courses

- Water and wastewater treatment process
- Organic Chemistry

### **Student transportation needed for project?**

No