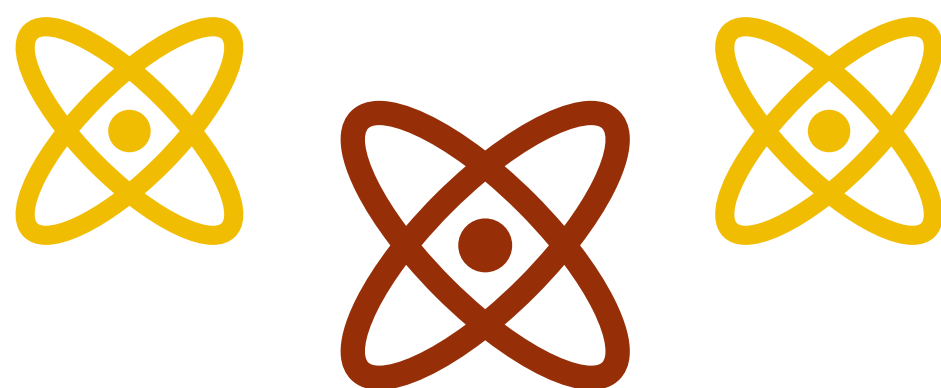




UMD Department of Chemistry & Biochemistry
Spring 2021 Seminar Series
Friday, February 26, 2021
3:00 p.m. Remote Via Zoom

JOHN FOX

**MASTER STUDENT, DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY, UNIVERSITY OF
MINNESOTA DULUTH
RESEARCH ADVISOR ~ DR. MELISSA MAURER-JONES**

Quantification and Characterization of Microplastics in Western Lake Superior

The amount of plastic waste entering the environment has steadily increased over the past 60 years and plastic contamination is now ubiquitous in aquatic systems across our planet. Before chemically degrading to constituent monomers and oligomers, plastic waste in the environment physically breaks down into smaller, more abundant microplastic particles. The behavior of microplastic in the environment is distinct from that of macroplastic and is not yet fully understood. Recent studies of microplastic in the marine environment have fractionated samples by particle dimension to determine the size distribution of microplastic waste and understand its fate in the environment. Efforts to quantify freshwater microplastic waste within the waterways of the Great Lakes region have focused on size fractions greater than 300 μm and sampling has largely been confined to surface waters, and sediments. In this project, we aim to characterize the size distribution of microplastic particles in western Lake Superior from 5 μm to 300 μm , to our knowledge a previously uninvestigated size range within Great Lakes waterways. Samples were collected from various depths in the water column to understand the vertical distribution of microplastic waste. This effort to characterize the vertical distribution of microplastic in the water column of Lake Superior is the first of its kind. Sampling occurred at five locations in western Lake Superior and methods included manta trawling, volume sampling, and in situ pumping and filtering. Microplastic identification and quantification is currently ongoing and utilizes visual microscopy, an established yet laborious and bias-prone technique, and FTIR microscopy, a less established technique that nonetheless has the potential to reduce researcher bias and increase throughput speed via automated counting and characterization. Results from this research will contribute to the growing body of knowledge regarding the fate of microplastic waste in freshwater systems. Knowledge regarding the size and spatial distribution of microplastic waste throughout freshwater ecosystems will allow for more efficient conservation policies and targeted efforts aimed at mitigating further contamination.