Examining the Presence of Microplastic in Wastewater-Derived Soil Amendment
Carlee Koritkowski & Danielle Garneau, Ph.D.
Center for Earth and Environmental Science | Garneau Ecology Lab | SUNY Plattsburgh

Introduction
- Previous research revealed the presence of microplastic particles in post-processing wastewater effluent (Mason et al. 2016)
- Bacterial by-products from wastewater treatment facilities used in commercial soil amendments likely contain these particulate
- Soil amendments are a potential terrestrial pathway for microplastic to enter aquatic ecosystems.

Objectives & Hypothesis
- Evaluate the presence of microplastic in a commercially available WWTP-derived soil amendment.
- Pilot Nile red staining as a means of quantifying and characterizing microplastics.
- We hypothesized that microplastics would be present in our samples.

Methods
- Two sample bouts X 3 replicates and one control using 15g amendment samples.
- KOH treatment and wet peroxide oxidation of samples.
- Particle size separation
- Microscopic quantification and characterization of particles.

Results
- Fibers were the most abundant particle type (avg. 0.3102 particles/gram) beads were least abundant (avg. 0.0009 particles/g)
- Particles 125μm or smaller were most abundant for all particle types (avg. 0.1056 particles/g)

Discussion
- As with other microplastic surveys that have focused on organisms, food and beverages, and atmospheric deposition, small sized fibers are a major microplastic pollutant.
- Terrestrial sources (land use) have the potential to be a major microplastic pollutant pathway into tributaries and watersheds (Baldwin et al. 2016).

Future Research
- Continue optimizing Nile red staining technique to facilitate microplastic characterization.
- Microplastics have the potential to impact terrestrial plant growth. SUNY Plattsburgh students Linh Le and Isabel Gomez have piloted research on the impacts of this material on sweet corn.
- Wet peroxide oxidation of worms from this project could provide more insight on microplastic uptake in soil organisms.

Literature Cited