2023 Analysis of Microplastics in Bed Sediments of Bainbridge Basin, WA

During the summer of 2023, a team of three students analyzed thirty-three sediment samples provided by the Washington State Department of Ecology's Puget Sound Ecosystem Monitoring Program. Sediment samples derived from Bainbridge Basin, were analyzed for their concentrations of microplastics. Microplastics are classified as polymers that are 5mm or smaller. Primary microplastics are defined as microplastics manufactured for a specific use, while secondary microplastics form from degradation of larger plastics. Aquatic animals and marine organisms within the Puget Sound rely on their environment to sustain life, often filter-feeding to ingest their food. Through filter-feeding, aquatic animals can accidentally ingest microplastics, potentially harming their overall health by exposing them to harmful chemicals and put them at risk for physical injury. Sediment samples were disaggregated using a mixture of water and potassium metaphosphate. Lithium metatungstate was then used to separate the density of the microplastics from the organic material. 20 mL of iron(ii) sulfate along with 20 mL of 30% Hydrogen peroxide was used to digest any remaining organic material, placed in a density separating funnel, and then sieved and examined using a dissection microscope. All categories of microplastics were present in the basin (n=605, Fibers=60%, Film=23, Fragment=10.2%, Foam=6%, Pellet=0.33%), with a minimum= 1, a maximum= 48, and an average of 18.3 per 200g of sediment. With continued efforts in researching microplastics concentrations at this site, we can hopefully influence the enactment of stern policies pertaining to various avenues of microplastic deposition such as shoreline littering, and fishing throughout marine environments.