# 2023 Analysis of Microplastics in Bed Sediments of the Puget Sound in the Salish Sea

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| **Major:** | Biomedical Sciences |
| **Abstract:** | Pollution of bays and estuaries by microplastics is an increasingly pressing concern, especially in bodies of water surrounded by densely populated areas. Microplastics have been found in waters virtually everywhere. Microplastics are known to be vectors for harmful chemicals and can impact digestion and other physiological processes in organisms. Quantifying the number of microplastics in the Puget Sound can give a clearer picture of the local scope of this issue. With this work, we monitored the levels of microplastics in sediments at 50 sites in the Puget Sound and related them to 2021. Sediments were disaggregated and density separated to isolate plastics, then samples were examined under light microscope. Plastics were characterized by type, color, and length. All samples contained microplastics. A total of 736 microplastics were counted with an average of 15 plastics per sample. 95.5% of plastics were fibers and 4.5% were films. 66.3% of plastics were clear. The dominance of clear fibers was consistent with past findings. The average microplastic length was 1.72 mm. Microplastics from 5 samples were confirmed by FT-IR spectroscopy. The most abundant type of plastic found was polypropylene followed by polyethylene. Other plastics found were styrene, vinyl chloride, nylon, BBP, and poly ethyl methacrylate. Future work will involve additional sampling of the 50 sites for monitoring of pollution levels. Acquiring data on microplastic levels can aid policy makers regarding decisions that reduce pollution. |
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This research paper used samples collected by the PSEMP Project from the Washington State Department of Ecology at the 50 long-term stations in the Salish Sea's Puget Sound. In addition to the microplastic analysis, other student researchers were able to analyze the sediments' particle size, total organic content, and *Alexandrium* cysts abundance. I would like to thank Julie Masura and Cheryl Greengrove for their mentorship, Hannia Larino, Savanna Thayer, and Peyton Scheschy for their contributions to this work.

Please contact Julie Masura at jmasura@uw.edu with any questions concerning this work.

**Introduction**

Pollution of bays and estuaries by microplastics is an increasingly pressing concern, especially in bodies of water surrounded by cities and densely populated areas. Higher levels of human activity and anthropogenic consumption lead to discarded plastics that degrade over time and become microplastics, a polymer smaller than 5mm (Spanjer et al. 2019). Microplastics can enter oceans and streams by way of stormwater runoff, wind, rivers, wastewater, and from plastics discarded directly into the ocean that degrade into microplastics (Werbowski et al. 2021). They also can be ingested by organisms and remain in their bodies, subsequently being transferred to organisms that eat them, affecting digestion and causing infection (Hale 2020). Microplastics can harbor harmful chemicals, posing another danger to organisms (Verla et al. 2019). Though the extent of the injury microplastics may cause is not yet fully understood, quantifying the number of microplastics in the Salish Sea's Puget Sound can give a clearer picture of the scope of this issue.

The Puget Sound Partnership's Puget Sound Ecosystem Monitoring Program (PSEMP) is a consortium of researchers partnered with University of Washington Tacoma (UWT) with the goal of monitoring and improving the health of the Puget Sound (PSP). UWT has been working with the Washington State Department of Ecology's Marine Sediment Monitoring Team since 2014 (Ruffner). The Department of Ecology has collected data on sediment quality since 1989. Previous work had involved the collection of samples from 10 different stations throughout the Salish Sea's Puget Sound to monitor sediment quality and toxicity, which was updated to 50 stations in 2018 (Dutch et al. 2018). Sediment contamination has increased, and benthos quality has decreased since the start of monitoring in both urban and non-urban bays, but chemical levels were highest in urban bays. The Puget Sound is surrounded by highly populated urban areas which generate a great amount of pollution. As populations have risen in the region, so has deforestation, the use of vehicles, the use of pesticides, the consumption of plastics, and many other factors that contribute harm to biota (Dutch et al. 2018). With increasing urbanization, it has become even more important to monitor the health of the Puget Sound.

As more insight is gained of the harm microplastics can cause, we may see future changes in policy, such as the 2021 single-use plastic bag ban (Bowie 2021) that was first implemented in Europe and is now gaining support in some states of the U.S. including a restriction of single-use plastics in Washington State. With this project, we aim to quantify and characterize the microplastics in the bed sediments of the Puget Sound so that informed policy decisions can be made in Washington state.

## Literature Review

Monitoring of plastic levels can provide data to influence policy decisions including laws on pollution. In 2021, a ban on single-use plastics was implemented in Washington prohibiting the distribution of single-use plastic bags and limiting the use of single-use plastic utensils (Jones 2021). Another ban, Washington House Bill 1085, was instated on single-use plastics in 2023 with the requirement of hotels to stop providing single-use plastic personal care items, banning soft film-wrapped docks and floats, and requiring a study of hard shell foam-filled floats and docks (Karnik 2023). One study that preceded these actions was a 2018 study of 41 nearshore sites of the Puget Sound. It found approximately 0.02 to 0.65 microplastic pieces per gram of sediment collected, with smaller microplastics (0.335-1 mm) most found (Black et al. 2018). The purpose of this study was to assess soil conditions and chemical composition of the Puget Sound as part of the Stormwater Action Monitoring program (SAM). Concerns about microplastics in the Puget Sound were their ingestion by animals and potential to transport chemicals; and assessing their levels helped to inform sediment management. This study followed the methods of processing outlined in “Methods for the Analysis of Microplastics in Bed Samples” (Masura et al. 2015), the same method the research in this report was based on. Microplastics were identified visually by length and type, including fibers, beads, films, foam, fragments, or line.

Since the study by Robert Black et al. (2018), other microplastic researchers have further characterized and confirmed microplastics by Raman or Fourier-Transform Infrared Spectroscopy. A study from Denmark utilized Focal Plane Array (FPA)-based FT-IR for analysis of municipal wastewater for microplastics (Simon et al. 2018). The inlet and outlet wastewater of 10 Danish treatment plants were sampled for particles 10-500 micrometers in size. The most common polymers found by number in raw wastewater were acrylates, but polypropylene contributed the most to the mass of microplastics in samples. In treated wastewater, polyethylene was the most abundantly found, but acrylates contributed the most to the collected mass.

The study by Simon et al. (2018) emphasized the importance of the mass of microplastics in samples as a data point. Microplastics can fragment over time, giving a falsely high concentration of plastics as they split into more pieces, so microplastic mass is a more consistent measurement than the number of particles alone. Many studies do not implement microplastic mass, especially when FT-IR is used for microplastic characterization. Our research allowed for microplastic mass to be measured when IR analysis was not used, but when analyzing by IR, microplastics were lost and were unable to be recovered, and when microplastic mass was measured in vials, plastics could not be recovered for IR.

**Methods**

In 2023, sediments were collected at 50 stations (fig. 1) using the method described by Dutch et al. (2018) with a van Veen grab sampler at 0-1 cm of depth.

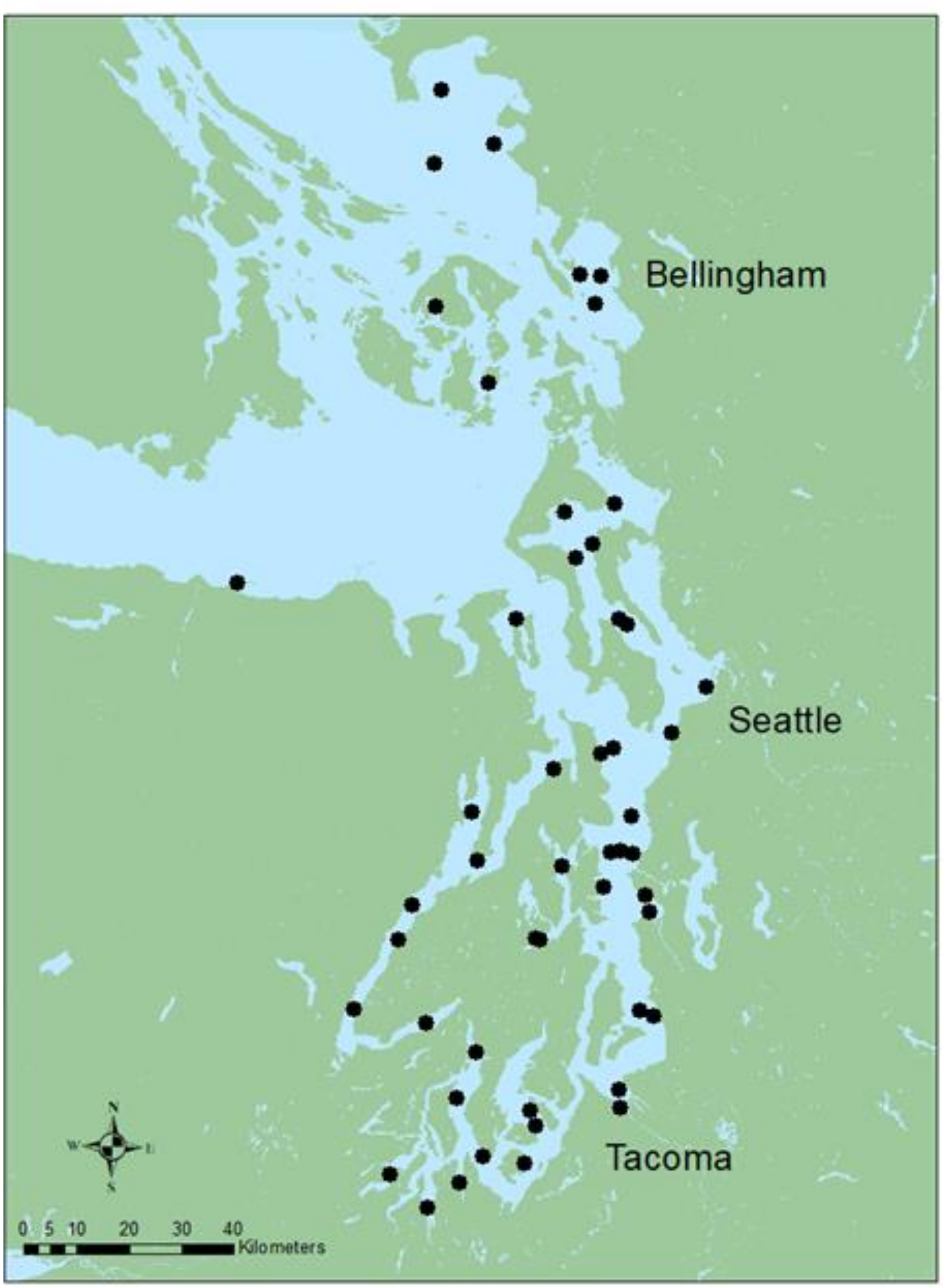


**Figure 1.** Map of 50 sampled stations of Puget Sound.

Sediments collected for analysis were kept in jars in a cooler at 4°C and later transferred to UWT and stored in a refrigerator at the same temperature. The method used for processing and analyzing microplastics is a modified version of "Methods for the Analysis of Microplastics in Bed Samples" (Masura et al. 2015).

Disaggregation

An equal amount of potassium metaphosphate solution (5.5g/L) in mL as sediment in grams was added to a beaker and stirred for one hour at high rpm to disaggregate the sediment. After disaggregation, sediment larger than 0.3 mm was rinsed with DI water, recovered from a sieve, transferred to a beaker, covered with a watchglass, and left in the oven to dry overnight at 90°C.

Density Separation

An equal volume of lithium metatungstate solution (1.6 g/mL) to potassium metaphosphate volume was added to the beaker and stirred with the dried sediments to separate solids by density and cause less dense material to float. Floating solids were transferred to the 0.3 mm sieve and sinking solids were discarded to further isolate plastics. Floating solids were rinsed with DI water, recovered from the sieve, and placed in the drying oven to dry overnight at 90°C.

Oxidation

Twenty milliliters of aqueous 0.05 M Fe (II) solution and 20 mL of 30% hydrogen peroxide were added to the dried solids to oxidize the natural organic material and further isolate the plastics. The mixture was covered and left to stand for 5 minutes and then heated on a hot plate to 75°C with a stir bar for 30 minutes to accelerate the reaction. An additional 20 mL of 30% hydrogen peroxide was added twice more for a total of 60 mL of 30% hydrogen peroxide.

Density Separation

Six grams of salt per 20 mL of sample were added to the beaker to increase the density of the solution. The solution was transferred to a density separator and the mixture was left to settle overnight. The settled solids were drained into a beaker and discarded, and floating solids were collected on a modified 0.3 mm sieve to further isolate plastics for microscope analysis.

Microscope Analysis

A magnification of 20x was used with a dissecting microscope for microplastic identification and collection. The microplastics were collected from the 0.3 mm sieve using forceps and their type, color, and length recorded. Microplastics were placed in a vial and their mass recorded.

FT-IR Spectroscopy

Five random samples were selected for FT-IR spectroscopy to validate plastics. The infrared light was set at 4000 to 600 $cm^{-1}$ % transmission and each sample was scanned 4 times. A background scan was completed first. Before analyzing the samples, a bead of high-density polyethylene was used as a control and scanned. Type, color, and length of plastics were recorded under a microscope before proceeding to be analyzed by FT-IR. Microplastics were moved to the sanitized UATR crystal of a Perkin Elmer FT-IR. A force gauge pressure of 20-50 was applied to plastics, ensuring a pressure of 80 or higher was never reached. The top polymer hit was chosen from the Perkin Elmer Polymers Library and recorded.

## Results and Discussion

Across all 2023 sampling of the 50 sites of the Puget Sound, 736 microplastics were found (Appendix 1). As indicated by fig. 2, there were similar levels of microplastics pollution in 2023 across all sampling sites whether they were collected next to densely populated cities or less occupied areas.

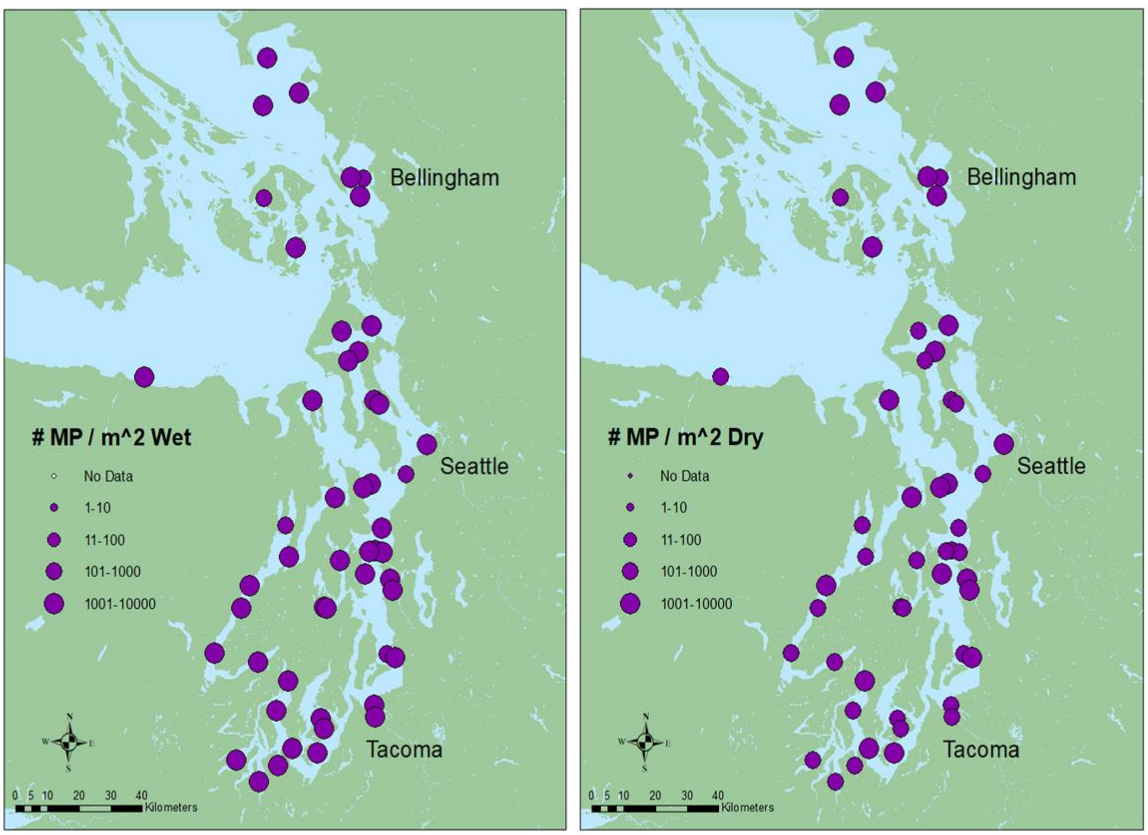


**Figure 2.** Maps of Puget Sound sampling locations and 2023 MP levels (Wet and dry).

Wet and dry measurements were included in fig. 2. Wet measurements indicated microplastics in wet sediment to give an understanding of their spatial distribution. Dry calculations indicate the microplastic distribution in dry sediment, or in solids with no water fraction. All 50 samples contained microplastics, with 95.5% of plastics being fibers and the remaining 4.5% films (fig. 3). No other plastic types were found.

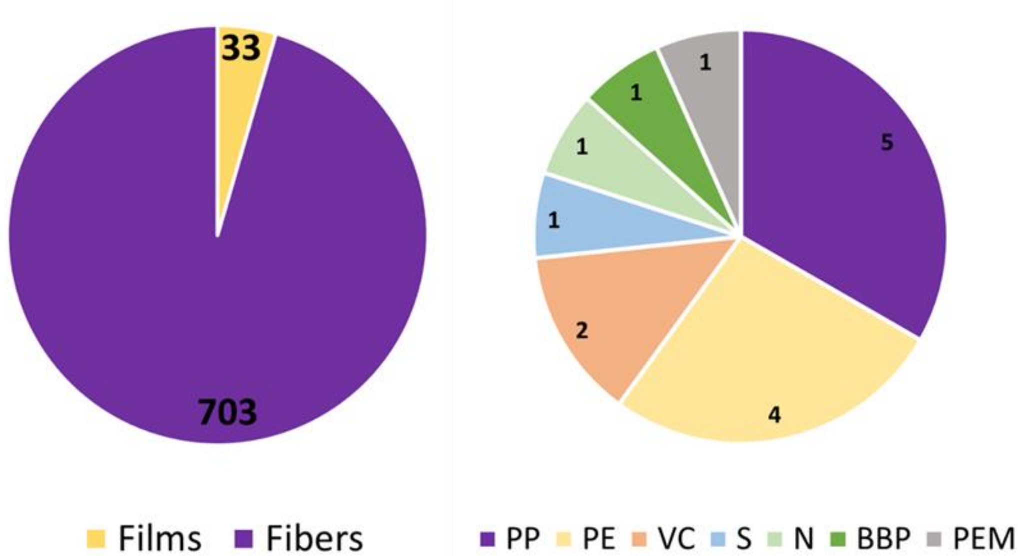


**Figure 3.** Left: Plastics characterized by light microscopy (films and fibers). Right: Polymers characterized by FT-IR spectroscopy.

Most plastics were clear, at 66.3%, but other colors were found including black, blue, purple, pink, white, and brown (Appendix 2). The average microplastic length was 1.72 mm (fig. 4).

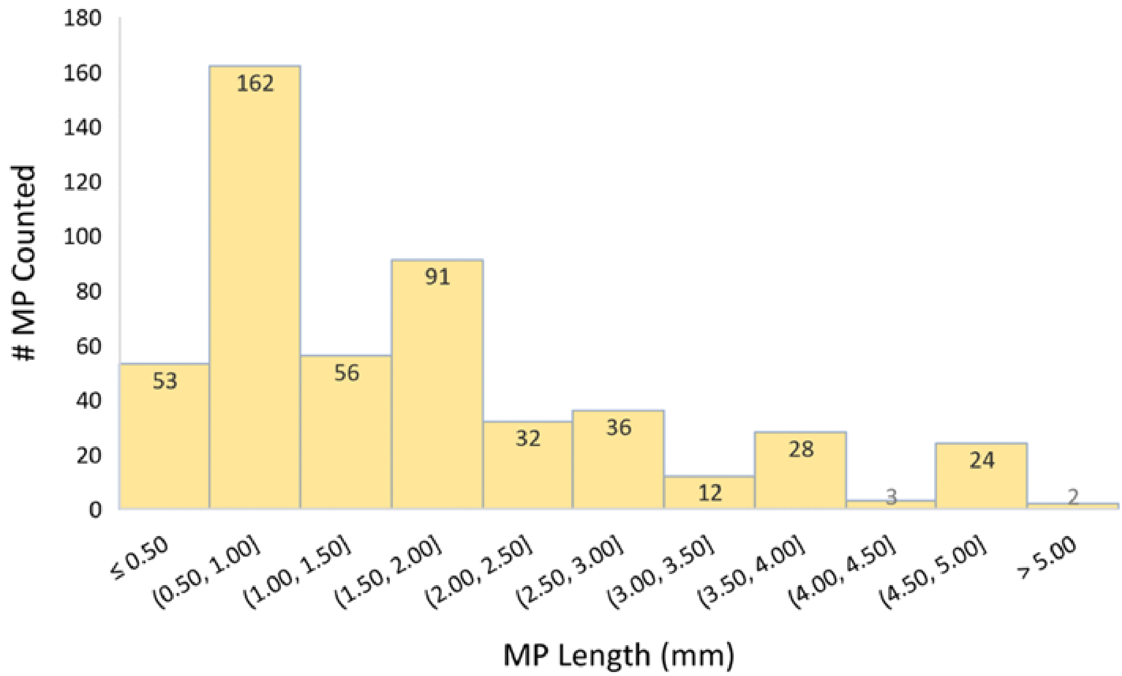


**Figure 4.** Length distribution of microplastics.

Five samples were analyzed by FT-IR to validate the debris were plastics (Appendix 3). Fifteen plastics were successfully scanned by FT-IR across 5 samples. Five plastics were polypropylene, 4 were polyethylene, 2 were vinyl chloride, and 1 styrene, nylon, benzyl butyl phthalate, and poly ethyl methacrylate.

More microplastics were found from 2023 than 2021, increasing from 411 plastics in 2021 to 736 in 2023. Plastic types found from 2023 were similar to 2021 data, with only fibers and films and a dominance of clear fibers.

Differences in numbers of microplastics between 2021 and 2023 levels can be attributed to possible increases in consumption or discarding of plastic materials, slight differences in sampling areas when collecting sediment, small differences in processing methods, and researcher attention to detail when counting microplastics under light microscopy. Though a ban was instated on many single-use plastics in Washington, it did not go into effect until July of 2023 (Karnik 2023), so effects on microplastic levels may not be noticeable for years and anthropogenic consumption of plastics was likely to increase until that point. Also, collection and characterization of microplastics under light microscopy requires attention to detail often for extended periods of time, and it would be easy to miss small fibers on the sieve, leading to differences in the amounts of microplastics observed by researchers.

Polypropylene was the most abundant plastic scanned by IR from 2023 samples. It is a plastic commonly used for purposes like packaging, construction, automotive parts, textiles, and many other consumer products (Hossain et al. 2024). The next most abundant plastic scanned by IR was polyethylene, which is mainly used to make plastic films for items such as garbage bags, sandwich bags, cling wrap, and in irrigation pipes and in electrical cables (Andrady and Neal 2009). There were issues with scanning fibers by FT-IR. Fibers could not be gripped as tightly by forceps due to their small surface area, often leading them to be blown away by drafts in the room. Their small surface area was also less practical for FT-IR because it resulted in them covering a very small area of the crystal, scanning them less effectively. Films were easier to scan by FT-IR. They are a shape more conducive to successful FT-IR analysis because they could cover more of the crystal, and they could be gripped more effectively by forceps to prevent them from blowing away.

## Conclusion

Microplastic pollution is ubiquitous across the Salish Sea's Puget Sound. More microplastics were found from 2023 samples than 2021, but not significantly more. Monitoring of microplastic levels will need to continue. Future work will involve additional yearly sampling of the 50 sites of the Salish Sea's Puget Sound by PSEMP for further comparative analysis of microplastics and other contaminants over time. Microplastic data taken from these stations will contribute to the monitoring of environmental health and inform stakeholders and policymakers, influencing future laws such as the single-use plastic bans of 2021 and 2023. Future work will also involve further development of a method for validating microplastics by FT-IR.

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**Appendix 1.** Stations and Microplastic Counts (Wet and dry)

| Station | Mass (g) | MP count | MP/m^2 (Wet) | MP/m^2 (Dry) |
|---|---|---|---|---|
| 13-R1 | 200.195 | 46 | 8964 | 6144 |
| 40016-R1 | 200.026 | 19 | 2285 | 801 |
| 222-R1 | 200.297 | 8 | 1087 | 459 |
| 38-R1 | 200.105 | 5 | 594 | 178 |
| 40018-R1 | 191.511 | 10 | 1396 | 378 |
| 40012-R1 | 200.038 | 10 | 1938 | 1463 |
| 40022-R1 | 197.414 | 8 | 999 | 329 |
| HCB003-R1 | 200.044 | 23 | 2743 | 780 |
| 40010-R1 | 200.448 | 30 | 4158 | 2386 |
| 21-R1 | 200.062 | 17 | 2789 | 1708 |
| 40015-R1 | 200.022 | 20 | 2396 | 669 |
| 40006-R1 | 200.006 | 14 | 2173 | 1527 |
| 40007-R1 | 200.013 | 8 | 1515 | 1184 |
| 40037-R1 | 200.299 | 11 | 1345 | 413 |
| 40008-R1 | 200.948 | 22 | 2548 | 683 |
| 40028-R1 | 200.125 | 30 | 3402 | 901 |
| 40029-R1 | 201.361 | 17 | 3085 | 1105 |
| 34-R1 | 200.356 | 10 | 2227 | 506 |
| 191-R1 | 200.247 | 26 | 3646 | 1749 |
| BLL009-R1 | 200.352 | 8 | 1542 | 1108 |
| 4-R1 | 200.435 | 4 | 474 | 150 |
| 40017-R1 | 200.035 | 11 | 1848 | 1257 |
| 40038-R1 | 200.15 | 17 | 2096 | 601 |
| 305R-R1 | 200.07 | 16 | 1617 | 403 |
| 40020-R1 | 200.101 | 7 | 1248 | 937 |
| 40027-R1 | 200.126 | 8 | 1366 | 1009 |
| 49-R1 | 200.69 | 13 | 1595 | 516 |
| 252-R1 | 200.886 | 19 | 2181 | 690 |
| 29-R1 | 200.081 | 9 | 1215 | 447 |
| 119-R1 | 200.079 | 14 | 4568 | 3912 |
| 40005-R1 | 200.154 | 16 | 2058 | 833 |
| 44-R1 | 200.395 | 23 | 2829 | 1668 |
| 265-R1 | 200.194 | 14 | 1758 | 665 |
| 281-R1 | 200.185 | 14 | 1857 | 848 |
| 40-R1 | 200.136 | 9 | 1337 | 924 |
| 40025-R1 | 200.064 | 6 | 772 | 321 |
| 40032-R1 | 200.212 | 14 | 2137 | 1206 |
| 3-R1 | 200.347 | 12 | 2204 | 1545 |
| 40009-R1 | 200.67 | 14 | 2481 | 1763 |
| 19-R1 | 200.362 | 11 | 1418 | 434 |

| Station | Mass (g) | MP count | MP/m^2 (Wet) | MP/m^2 (Dry) |
|---|---|---|---|---|
| 209R-R1 | 200.364 | 14 | 2465 | 1714 |
| 40036-R1 | 200.382 | 23 | 3937 | 2398 |
| 40013-R1 | 200.296 | 18 | 2532 | 1307 |
| 40011-R1 | 200.741 | 9 | 1116 | 516 |
| 40021-R1 | 200.797 | 23 | 2783 | 910 |
| 40030-R1 | 200.239 | 18 | 2096 | 559 |
| 40019-R1 | 200.425 | 5 | 635 | 242 |
| 40034-R1 | 200.327 | 9 | 1866 | 1429 |
| 52-R1 | 130.009 | 17 | 4532 | 2866 |
| 40026-R1 | 200.235 | 7 | 941 | 241 |

**Appendix 2.** Microplastic Data and Characterization

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| 13-R1 | 200.195 | 225 | fiber | clear | 1.00 | 18 | -0.00864 | |
| | | | fiber | clear | 1.33 | 15 | | |
| | | | fiber | clear | 1.65 | 5 | | |
| | | | fiber | clear | 2.00 | 4 | | |
| | | | fiber | clear | 2.31 | 2 | | |
| | | | fiber | clear | 4.00 | 2 | | 46 |
| | | | | | | | | |
| 40016-R1 | 200.026 | 223.082 | fiber | clear | 1.33 | 3 | -0.00049 | |
| | | | fiber | blue | 1.33 | 2 | | |
| | | | fiber | black | 1.00 | 3 | | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | black | 2.31 | 3 | | |
| | | | fiber | white | 1.65 | 1 | | |
| | | | fiber | red | 1.65 | 1 | | |
| | | | fiber | gray | 3.30 | 2 | | |
| | | | fiber | black | 3.63 | 2 | | |
| | | | fiber bundle | clear, gray, black, blue | 1.65 | 1 | | 19 |
| | | | | | | | | |
| 222-R1 | 200.297 | 220 | Fiber | Clear | 1.32 | 1 | -0.00005 | |
| | | | Fiber | Black | 1.32 | 1 | | |
| | | | Fiber | Black | 1.65 | 1 | | |
| | | | Fiber | Clear | 2.00 | 1 | | |
| | | | Fiber | Black | 2.00 | 1 | | |
| | | | Fiber | Gray | 3.30 | 1 | | |
| | | | Fiber | Blue | 3.63 | 1 | | |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | Fiber | Black | 4.95 | 1 | | 8 |
| | | | | | | | | |
| 38-R1 | 200.105 | 225.275 | Film | Clear | 0.33 | 1 | 0.00021 | |
| | | | Fiber | Black | 0.66 | 1 | | |
| | | | Fiber | Gray | 1.32 | 1 | | |
| | | | Fiber | Purple | 1.65 | 1 | | |
| | | | Fiber | Clear | 4.00 | 1 | | 5 |
| | | | | | | | | |
| 40018-R1 | 191.511 | 225.084 | Fiber | Clear | 0.66 | 5 | 0.00026 | |
| | | | Fiber | Blue | 0.33 | 1 | | |
| | | | Fiber | Black | 1.00 | 1 | | |
| | | | Fiber | Black | 1.32 | 1 | | |
| | | | Fiber | Red | 2.64 | 1 | | |
| | | | Film | Clear | 3.30 | 1 | | 10 |
| | | | | | | | | |
| 40012-R1 | 200.038 | 222 | Fiber | Clear | 0.66 | 1 | 0.00029 | |
| | | | Fiber | Purple | 0.66 | 1 | | |
| | | | Fiber | Clear | 1.00 | 1 | | |
| | | | Fiber | Black | 1.00 | 1 | | |
| | | | Fiber | Clear | 1.33 | 2 | | |
| | | | Fiber | Black | 1.33 | 1 | | |
| | | | Fiber | Clear | 1.65 | 1 | | |
| | | | Film | Gray | 2.00 | 1 | | |
| | | | Fiber | Clear | 4.95 | 1 | | 10 |
| | | | | | | | | |
| 40022-R1 | 197.414 | 223 | Fiber | Black | 0.33 | 1 | 0.00026 | |
| | | | Fiber | Black | 0.66 | 1 | | |
| | | | Fiber | Black | 1.33 | 1 | | |
| | | | Fiber | Clear | 1.65 | 1 | | |
| | | | Fiber | Gray | 1.65 | 1 | | |
| | | | Fiber | Clear | 2.31 | 1 | | |
| | | | Fiber | Clear | 2.64 | 1 | | |
| | | | Fiber | Clear | 5.00 | 1 | | 8 |
| | | | | | | | | |
| HCB003-R1 | 200.044 | 220.002 | fiber | white | 4.00 | 1 | -0.00264 | |
| | | | fiber | red | 2.00 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | purple | 3.30 | 1 | | |
| | | | fiber | brown | 2.00 | 1 | | |
| | | | fiber | clear | 4.95 | 1 | | |
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | clear | 3.30 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.64 | 1 | | |
| | | | fiber | clear | 2.31 | 3 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 1.00 | 3 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | film | clear | 0.33 | 1 | | 23 |
| | | | | | | | | |
| 40010-R1 | 200.448 | 218 | fiber | black | 1.00 | 1 | -0.00134 | |
| | | | fiber | gray | 1.65 | 1 | | |
| | | | fiber | clear | 5.00 | 3 | | |
| | | | fiber | clear | 4.29 | 2 | | |
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | clear | 3.65 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.31 | 2 | | |
| | | | fiber | clear | 1.65 | 3 | | |
| | | | fiber | clear | 1.32 | 6 | | |
| | | | fiber | clear | 1.00 | 3 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | clear | 0.33 | 3 | | 30 |
| | | | | | | | | |
| 21-R1 | 200.062 | 225.292 | film | clear | 1.00 | 1 | -0.00220 | |
| | | | fiber | light blue | 0.66 | 1 | | |
| | | | fiber | brown | 2.31 | 2 | | |
| | | | fiber | black | 2.31 | 1 | | |
| | | | fiber | tan | 1.00 | 1 | | |
| | | | fiber | brown | 1.00 | 1 | | |
| | | | fiber | clear | 5.00 | 1 | | |
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | clear | 2.64 | 1 | | |
| | | | fiber | clear | 1.65 | 2 | | |
| | | | fiber | clear | 1.32 | 3 | | |
| | | | fiber | clear | 0.66 | 2 | | 17 |
| | | | | | | | | |
| 40015-R1 | 200.022 | 226.44 | fiber | black | 2.31 | 2 | 0.00187 | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | purple | 0.66 | 1 | | |
| | | | fiber | gray | 1.00 | 1 | | |
| | | | fiber | blue | 1.32 | 1 | | |
| | | | fiber | green | 2.64 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.64 | 2 | | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | clear | 1.00 | 4 | | |
| | | | fiber | clear | 0.66 | 1 | | 20 |
| | | | | | | | | |
| 40006-R1 | 200.006 | 225 | fiber | black | 1.32 | 1 | -0.02333 | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | fiber | white | 4.00 | 1 | | |
| | | | fiber | white | 2.64 | 1 | | |
| | | | fiber | pink | 2.31 | 1 | | |
| | | | fiber | pink | 2.00 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | 14 |
| | | | | | | | | |
| 40007-R1 | 200.013 | 225 | fiber | pink | 1.00 | 1 | -0.00030 | |
| | | | fiber | light blue | 1.32 | 1 | | |
| | | | fiber | clear | 4.95 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | clear | 0.66 | 1 | | 8 |
| | | | | | | | | |
| 40037-R1 | 200.299 | 223 | fiber | black | 2.31 | 1 | 0.00009 | |
| | | | fiber | black | 1.65 | 2 | | |
| | | | fiber | blue | 1.00 | 2 | | |
| | | | fiber | red | 0.66 | 1 | | |
| | | | fiber | clear | 5.33 | 1 | | |
| | | | fiber | clear | 4.62 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 11 |
| | | | | | | | | |
| 40008-R1 | 200.948 | 225 | fiber | blue | 1.00 | 2 | 0.00022 | |
| | | | fiber | gray | 1.65 | 1 | | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | yellow | 4.00 | 1 | | |
| | | | fiber | black | 3.63 | 1 | | |
| | | | fiber | black | 3.00 | 1 | | |
| | | | fiber | white | 1.32 | 1 | | |
| | | | fiber | white | 1.00 | 1 | | |
| | | | fiber | white | 0.33 | 1 | | |
| | | | fiber | black & clear | 3.30 | 1 | | |
| | | | fiber | blue & clear | 1.65 | 1 | | |
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | clear | 2.31 | 1 | | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 1.65 | 2 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | clear | 0.66 | 4 | | 22 |
| | | | | | | | | |
| 40028-R1 | 200.125 | 220.174 | fiber | red | 1.65 | 1 | 0.00011 | |
| | | | fiber | blue | 2 | 1 | | |
| | | | fiber | tan | 1.65 | 1 | | |
| | | | fiber | black | 0.66 | 2 | | |
| | | | fiber | red | 1 | 1 | | |
| | | | fiber | dark blue | 1.32 | 1 | | |
| | | | fiber | light blue | 1 | 1 | | |
| | | | fiber | clear | 4.62 | 1 | | |
| | | | fiber | clear | 4 | 1 | | |
| | | | fiber | clear | 3.3 | 1 | | |
| | | | fiber | clear | 2.64 | 1 | | |
| | | | fiber | clear | 2.31 | 2 | | |
| | | | fiber | clear | 2 | 1 | | |
| | | | fiber | clear | 1.65 | 6 | | |
| | | | fiber | clear | 1 | 5 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | clear | 0.33 | 1 | | 30 |
| | | | | | | | | |
| 40029-R1 | 201.361 | 218.346 | fiber cluster | white | 1.00 | 1 | 0.00048 | |
| | | | fiber | red | 4.95 | 1 | | |
| | | | fiber | black | 5.33 | 1 | | |
| | | | fiber | blue | 1.65 | 1 | | |
| | | | fiber | gray | 3.00 | 1 | | |
| | | | fiber | clear | 4.95 | 2 | | |
| | | | fiber | clear | 3.63 | 2 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.00 | 4 | | |
| | | | fiber | clear | 0.66 | 3 | | 17 |
| | | | | | | | | |
| 34-R1 | 200.356 | 186.428 | fiber cluster | red & clear | 2.64 | 1 | -0.00002 | |
| | | | fiber | red | 4.95 | 2 | | |
| | | | fiber | red | 1.00 | 1 | | |
| | | | fiber | red | 0.66 | 1 | | |
| | | | fiber | tan | 2.31 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | clear | 0.66 | 1 | | 10 |
| | | | | | | | | |
| 191-R1 | 200.247 | 194.845 | fiber | red | 4.62 | 1 | 0.00016 | |
| | | | fiber | clear | 2.64 | 1 | | |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.65 | 3 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | blue | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 4 | | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | fiber | tan | 1.00 | 1 | | |
| | | | fiber | white | 0.66 | 2 | | |
| | | | fiber | tan | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | film | clear | 0.33 | 4 | | |
| | | | fiber | pink | 0.33 | 1 | | 26 |
| | | | | | | | | |
| BLL009-R1 | 200.352 | 221.124 | fiber | black | 4.95 | 1 | 0.00006 | |
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | tan | 0.33 | 1 | | 8 |
| | | | | | | | | |
| 4-R1 | 200.435 | 224.589 | fiber | clear | 4.95 | 1 | -0.00005 | |
| | | | fiber | clear | 2.65 | 1 | | |
| | | | fiber | gray | 2.32 | 1 | | |
| | | | fiber | red | 0.33 | 1 | | 4 |
| | | | | | | | | |
| 40017-R1 | 200.035 | 226.352 | fiber | brown | 4.95 | 1 | 0.00009 | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.00 | 2 | | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | clear | 2.32 | 1 | | |
| | | | film | clear | 1.32 | 1 | | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | blue | 0.33 | 1 | | 11 |
| | | | | | | | | |
| 40038-R1 | 200.150 | 222.476 | film | white | 3.00 | 1 | 0.00028 | |
| | | | fiber | gray | 3.00 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | clear and blue | 1.65 | 1 | | |
| | | | film | white | 1.00 | 1 | | |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 1.00 | 1 | | |
| | | | film | clear | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | |
| | | | fiber | light blue | 0.66 | 1 | | |
| | | | film | white | 0.33 | 2 | | |
| | | | film | clear | 0.33 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 17 |
| | | | | | | | | |
| 305R-R1 | 200.070 | 218.284 | fiber | clear and black | 4.32 | 2 | 0.00015 | |
| | | | fiber | clear | 4.00 | 2 | | |
| | | | fiber | blue | 4.00 | 1 | | |
| | | | fiber | clear and black | 3.00 | 1 | | |
| | | | fiber | clear | 3.00 | 2 | | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | clear | 1.65 | 2 | | |
| | | | fiber | blue | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | |
| | | | fiber | tan | 0.66 | 1 | | 16 |
| | | | | | | | | |
| 40020-R1 | 200.101 | 225.002 | fiber | clear | 4.00 | 1 | 0.00026 | |
| | | | fiber | clear | 3.65 | 1 | | |
| | | | fiber | gold | 3.32 | 1 | | |
| | | | fiber | clear | 2.65 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 7 |
| | | | | | | | | |
| 40027-R1 | 200.126 | 220.106 | fiber | white | 4.95 | 1 | 0.00012 | |
| | | | fiber | clear | 4.95 | 1 | | |
| | | | fiber | gray | 2.65 | 1 | | |
| | | | fiber | light blue | 1.65 | 1 | | |
| | | | fiber | gray | 1.00 | 2 | | |
| | | | fiber | blue | 1.00 | 1.000 | | |
| | | | fiber | red | 0.66 | 1 | | 8 |
| | | | | | | | | |
| 49-R1 | 200.69 | 222.506 | fiber | clear | 4.00 | 1 | 0.00012 | |
| | | | fiber | black | 2.31 | 1 | | |
| | | | fiber | clear | 3.32 | 1 | | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | clear | 1.00 | 2 | | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | light blue | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | clear | 0.33 | 1 | | 13 |
| | | | | | | | | |
| 252-R1 | 200.886 | 226.369 | fiber | clear | 3.00 | 1 | 0.00033 | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | blue | 2.00 | 1 | | |
| | | | fiber | red | 2.00 | 1 | | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | blue, purple | 1.32 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | gray | 1.00 | 1 | | |
| | | | fiber | red | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 4 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 19 |
| | | | | | | | | |
| 29-R1 | 200.081 | 220.059 | fiber | white | 4.62 | 1 | 0.00039 | |
| | | | fiber | black | 4.62 | 1 | | |
| | | | fiber | gray | 3.32 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | black and white | 1.65 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | 9 |
| | | | | | | | | |
| 119-R1 | 200.079 | 224.968 | fiber | black | 2.31 | 1 | 0.00041 | |
| | | | fiber | brown | 2.31 | 1 | | |
| | | | fiber | black | 4.00 | 1 | | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | tan | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | blue | 0.33 | 1 | | |
| | | | fiber | black | 0.33 | 1 | | |
| | | | fragment | clear | 0.33 | 3 | | |
| | | | fiber | clear | 0.33 | 1 | | 14 |
| | | | | | | | | |
| 40005-R1 | 200.154 | 218.324 | fiber | clear | 4.65 | 1 | 0.00012 | |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 4.00 | 1 | | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | clear | 1.65 | 2 | | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | black and clear | 2.31 | 1 | | |
| | | | fiber | white | 1.32 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 0.33 | 2 | | |
| | | | film | clear | 0.33 | 1 | | 16 |
| | | | | | | | | |
| 44-R1 | 200.395 | 222.479 | fiber | clear | 2.64 | 1 | 0.00004 | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | film | white | 0.66 | 1 | | |
| | | | film | clear | 1.00 | 1 | | |
| | | | film | clear | 0.66 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 4 | | |
| | | | fiber | tan | 0.33 | 3 | | |
| | | | fiber | clear | 0.33 | 3 | | |
| | | | film | clear | 0.33 | 1 | | |
| | | | fiber | clear | 3.00 | 1 | | 23 |
| | | | | | | | | |
| 265-R1 | 200.194 | 220.999 | fiber | clear | 2.00 | 1 | 0 | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | black | 1.00 | 2 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | clear | 0.33 | 4 | | 14 |
| | | | | | | | | |
| 281-R1 | 200.185 | 194.769 | fiber | clear | 2.31 | 1 | 0.0003 | |
| | | | fiber | black | 2.00 | 1 | | |
| | | | fiber | black | 1.32 | 1 | | |
| | | | fiber | clear | 1.32 | 3 | | |
| | | | fiber | clear | 1.00 | 3 | | |
| | | | fiber | clear | 0.66 | 4 | | |
| | | | film | clear | 0.33 | 1 | | 14 |
| | | | | | | | | |
| 40-R1 | 200.136 | 220.028 | film | clear | 3.65 | 1 | 0.00024 | |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | film | clear | 3.00 | 1 | | |
| | | | fiber | black | 2.31 | 1 | | |
| | | | film | clear | 2.00 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | 9 |
| | | | | | | | | |
| 40025-R1 | 200.064 | 218.27 | fiber | clear | 1.65 | 1 | 0.00016 | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 6 |
| | | | | | | | | |
| 40032-R1 | 200.212 | 224.907 | fiber | clear | 4.30 | 1 | 0 | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear and blue | 1.32 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | gray | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 4 | | |
| | | | fiber | clear | 0.33 | 1 | | |
| | | | fiber | black | 0.33 | 1 | | |
| | | | fiber | blue | 0.33 | 1 | | 14 |
| | | | | | | | | |
| 3-R1 | 200.347 | 220.988 | fiber | clear | 3.00 | 1 | 0 | |
| | | | fiber | black | 1.32 | 1 | | |
| | | | fiber | brown | 1.65 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 1.00 | 3 | | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | clear | 0.33 | 4 | | 12 |
| | | | | | | | | |
| 40009-R1 | 200.67 | 222.45 | fiber | blue | 4.95 | 1 | 0.00117 | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | cyan | 1.32 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 2 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | blue | 0.33 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 14 |

| **Sample** | **Sample weight** | **Beaker weight** | **Type (fiber, fragment, foam, pellet, Styrofoam)** | **Color** | **Size(mm)** | **Tally** | **Total Microplastic Mass (g), plastic type if IR used** | **Sum plastics in sample** |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 19-R1 | 200.362 | 225.13 | fiber | clear | 2.00 | 1 | 0.0002 | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | film | clear | 0.66 | 2 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | film | clear | 0.33 | 2 | | |
| | | | fiber | black | 0.33 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 11 |
| | | | | | | | | |
| 209R-R1 | 200.364 | 186.315 | fiber | red and clear | 4.00 | 1 | 0.00004 | |
| | | | fiber | black | 2.31 | 1 | | |
| | | | fiber | clear | 1.65 | 2 | | |
| | | | fiber | clear | 1.32 | 3 | | |
| | | | fiber | purple | 1.00 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | |
| | | | film | clear | 0.33 | 2 | | 14 |
| | | | | | | | | |
| 40036-R1 | 200.382 | 225.861 | fiber | clear | 4.95 | 1 | 0.00004 | |
| | | | fiber | gray | 3.00 | 1 | | |
| | | | fiber | blue | 2.00 | 1 | | |
| | | | fiber | black | 2.00 | 2 | | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | gray | 1.32 | 1 | | |
| | | | fiber | black | 1.32 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | fiber | clear | 1.00 | 5 | | |
| | | | fiber | black | 1.00 | 2 | | |
| | | | fiber | red | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | |
| | | | fiber | black | 0.33 | 1 | | |
| | | | fiber | clear | 0.33 | 2 | | 23 |
| | | | | | | | | |
| 40013-R1 | 200.296 | 218.27 | film | pink | 3.30 | 1 | 0 | |
| | | | fiber | clear | 3.30 | 1 | | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | black | 1.65 | 1 | | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | black | 1.00 | 1 | | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | fiber | clear | 1.00 | 3 | | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | red | 0.66 | 1 | | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | clear | 0.66 | 3 | | |
| | | | film | clear | 0.33 | 1 | | |
| | | | fiber | black | 0.33 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 18 |
| | | | | | | | | |
| 40011-R1 | 200.741 | 209.665 | fiber | clear | 2.31 | 1 | 0 | |
| | | | fiber | clear | 2.00 | 1 | | |
| | | | fiber | clear | 1.00 | 3 | | |
| | | | film | clear | 0.66 | 1 | | |
| | | | fiber | blue | 0.66 | 2 | | |
| | | | fiber | clear | 0.33 | 1 | | 9 |
| | | | | | | | | |
| 40021-R1 | 200.797 | 220.978 | fiber | brown | 4.00 | 1 | 0 | |
| | | | fiber | clear | 2.00 | 2 | | |
| | | | fiber | black | 1.32 | 1 | | |
| | | | fiber | purple | 1.32 | 1 | | |
| | | | fiber | black | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | clear | 0.33 | 9 | | |
| | | | fiber | blue | 0.33 | 1 | | |
| | | | fiber | black | 0.33 | 1 | | 23 |
| | | | | | | | | |
| 40030-R1 | 200.239 | 194.765 | film | clear | 4.00 | 1 | PE | |
| | | | fiber | black | 3.00 | 1 | | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | gray | 2.00 | 1 | | |
| | | | fiber | clear | 1.32 | 2 | | |
| | | | film | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 4 | S, N, PP | |
| | | | fiber | blue | 1.00 | 1 | | |
| | | | film | clear | 0.66 | 1 | PE | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | gray | 0.33 | 1 | | 18 |
| | | | | | | | | |
| 40019-R1 | 200.425 | 220.003 | fiber | clear | 2.31 | 1 | | |
| | | | fiber | brown | 1.65 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | PP | |
| | | | fiber | clear | 0.66 | 1 | | |
| | | | fiber | clear | 0.33 | 1 | | 5 |
| | | | | | | | | |
| 40034-R1 | 200.327 | 224.88 | fiber | clear | 4.95 | 1 | PP | |
| | | | fiber | clear | 4.95 | 1 | | |
| | | | fiber | black | 3.00 | 1 | VC | |
| | | | fiber | brown | 2.00 | 1 | VC | |

| Sample | Sample weight | Beaker weight | Type (fiber, fragment, foam, pellet, Styrofoam) | Color | Size(mm) | Tally | Total Microplastic Mass (g), plastic type if IR used | Sum plastics in sample |
|---|---|---|---|---|---|---|---|---|
| | | | fiber | purple | 2.00 | 1 | | |
| | | | fiber | clear | 1.00 | 1 | | |
| | | | fiber | clear | 0.66 | 2 | | |
| | | | fiber | clear | 0.33 | 1 | | 9 |
| | | | | | | | | |
| 52-R1 | 130.009 | 225.282 | fiber | black | 3.63 | 1 | | |
| | (previous sample was thrown on ground by microscope demo) | | fiber | clear | 3.00 | 1 | PP | |
| | | | fiber | clear | 3.00 | 1 | | |
| | | | fiber | clear | 2.31 | 1 | | |
| | | | fiber | black | 2.00 | 1 | BBP | |
| | | | fiber | clear | 1.32 | 1 | PEM | |
| | | | fiber | clear | 1.32 | 1 | | |
| | | | fiber | clear | 1.00 | 4 | | |
| | | | fiber | clear | 1.00 | 1 | PP | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 3 | | |
| | | | fiber | black | 0.66 | 1 | | 17 |
| | | | | | | | | |
| 40026-R1 | 200.235 | 225.798 | fiber | clear | 2.00 | 1 | | |
| | | | fiber | black | 2.00 | 1 | PE | |
| | | | fiber | clear | 1.65 | 1 | | |
| | | | fiber | blue | 0.66 | 1 | | |
| | | | fiber | black | 0.66 | 1 | | |
| | | | fiber | clear | 0.66 | 1 | PE | |
| | | | fiber | clear | 0.66 | 1 | | 7 |
| **Total plastics: 736** | | | | | | | | |

**Appendix 3.** IR Analysis of Microplastics

| Station | Plastic Category | Polymer Type | % Confidence |
|---|---|---|---|
| 40030-R1 | Film | PE | 96.3 |
| 40030-R1 | Film | PE | 80.3 |
| 40030-R1 | Fiber | S | 36.6 |
| 40030-R1 | Fiber | N | 87.3 |
| 40030-R1 | Fiber | PP | 93.9 |
| 40019-R1 | Fiber | PP | 95.6 |
| 40034-R1 | Fiber | PP | 86.0 |
| 40034-R1 | Fiber | VC | 56.6 |
| 40034-R1 | Fiber | VC | 51.0 |
| 52-R1 | Fiber | PP | 97.1 |

| Station | Plastic Category | Polymer Type | % Confidence |
| --- | --- | --- | --- |
| 52-R1 | Fiber | PP | 84.7 |
| 52-R1 | Fiber | PEM | 65.4 |
| 52-R1 | Fiber | BBP | 52.5 |
| 40026-R1 | Fiber | PE | 46.1 |
| 40026-R1 | Fiber | PE | 90.1 |

| Abbreviation | Plastic Type |
| --- | --- |
| PE | Polyethylene |
| S | Styrene |
| N | Nylon |
| PP | Polypropylene |
| VC | Vinyl chloride |
| PEM | Poly ethyl methacrylate |
| BBP | Benzyl butyl phthalate |