

Macroplastics Report 2020



Purpose

Studying macroplastics (plastic items larger than 1 in.) remains a top priority for Hudson River Park (HRPK) as local and global plastic pollution continues to be a threat to the environment. Since the launch of Park Over Plastic in 2019, HRPK has [taken steps](#) toward building a plastic-free community by reducing single-use plastics in Park events, facilities and tenant spaces. During the COVID-19 pandemic, millions of visitors found respite in the Park, indicating the importance that health and protection of natural resources like the Hudson River Estuary have to the community. Taking into account the limitations that 2020 presented, this report shares findings from the year's macroplastics research as well as next steps in reaching future goals of this project.

Key Research Questions

- What types and concentrations of macroplastics are present and are there any temporal trends?
- What is the spatial distribution and variability of macroplastics?

Fig. 1 (below) | Map of survey sites, Gansevoort Peninsula and Pier 76. Macroplastics are counted and categorized on a 100 meter shoreline (in red). Both sites are located between Combined Sewer Outflows (CSOs), a known source of marine debris.



Fig. 2 (above) | Volunteers help survey macroplastics one transect at a time at Pier 76's shoreline.

Methods

- Surveyed 100m (in 10m transects) on the Gansevoort Peninsula and Pier 76 shorelines
- Recorded the count and category of plastic debris items larger than 2.55cm/~1in (bottle cap size) in each transect
- Resin identification codes (RIC), or plastic types identified by numbers 1-7, are also recorded if visible
- Total weight of plastic debris collected is recorded in pounds (lbs.) using a platform scale
- Plastic debris recorded by category and location is entered into NOAA's Marine Debris Tracker app

Major Findings

In 2020, 3,311 plastic pieces were counted and categorized within the months of March, August, September and October. All surveys were conducted at Pier 76 with an additional survey in September at Gansevoort Peninsula. A total of 229 lbs. of marine debris were removed from the Park’s shorelines which included plastic, metal, glass, drift wood, and other materials. At least 18% of the plastics recovered were recyclable such as beverage bottles, containers and rigid fragments. Due to irregular frequency of survey dates and locations plus fewer volunteer support in 2020, little comparison could be made between 2019 and 2020 data. However, surveys conducted, with the same number of volunteers, in September 2019 and 2020 at Pier 76 showed that foam and rigid fragments were the most common categories.

- Foam items were the most common category at 2,108 total pieces
- #1 PET (polyethylene terephthalate) was the most common plastic type counted at 84% of the total.

Fig. 3 (below) | After #1 PET, #5 PP (polypropylene) was the second most common plastic type. #5 products include to-go food and beverage containers.

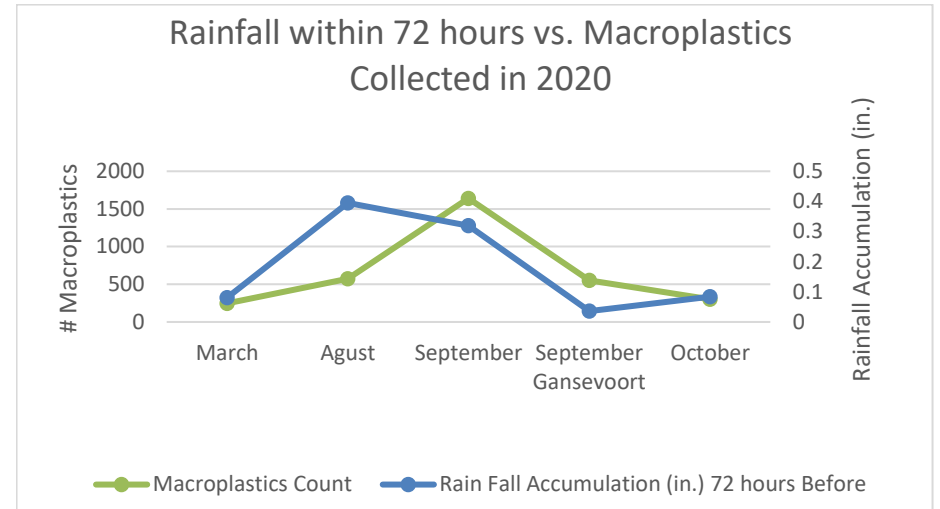
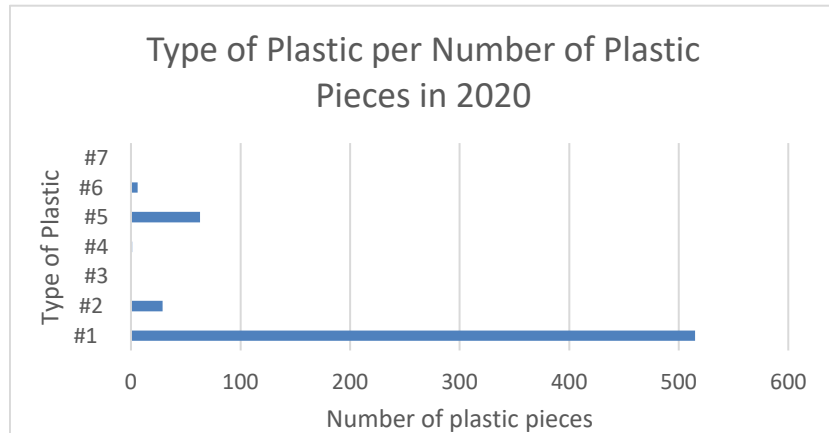
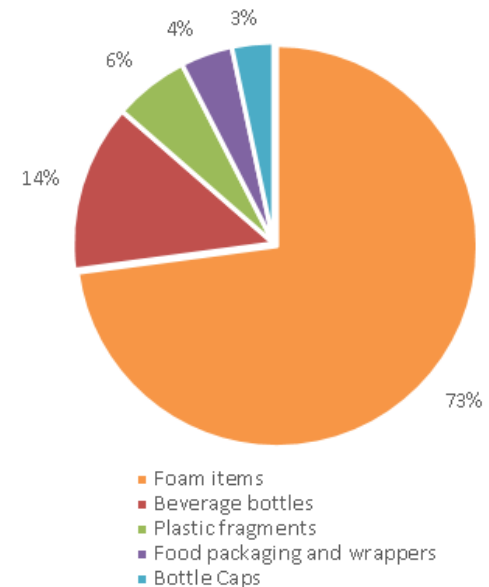


Fig. 4 (above) | Rainfall and the number of plastics counted had a closer relationship this year than in previous years’ data. Direct impact is not yet confirmed.

Fig. 5 (below) | Unlike past years, bottle caps were in the top five most common type of plastic collected in 2020 surveys.

Top 5 Most Counted Plastics



Take Aways

When state-wide shelter-in-place was ordered in mid-March during the COVID-19 pandemic, the Park was forced to pause volunteering and seasonal internships which are essential to collecting sufficient data at shoreline cleanups. Between April-July, no cleanups were conducted; a time when the bulk of the year's data is historically collected. Despite this challenge, five surveys were completed compared to 2019's eight surveys. This year, new safety protocols were developed that will continue to be used in future projects and programs. Additionally, due to the safety considerations of an active construction site, Gansevoort Peninsula was closed off to volunteers. Even Park staff were discouraged from entering which resulted in one cleanup conducted by three staff members in September. Gansevoort has repeatedly accumulated more marine debris than Pier 76 with its steeper, rockier incline and deeper crevasses. This along with reduced number of surveys may be a contributor to lower debris counts in 2020.

Yet in the face of these obstacles, the data that were collected was enough to show that plastic pollution in our waterways has not decreased during the pandemic. Foam pieces and single-use products, such as beverage bottles and food packaging, continue to be prevalent on the Park's shorelines. CSOs (combined sewer outfalls) are a major source of pollution in the River due to rainfall accumulation diverting millions of gallons of wastewater into waterways. In comparison to former years', data this year showed a closer relationship between rainfall and number of plastic pieces counted. One theory is that, since the Pier 76 site is much closer to a CSO than the Gansevoort site, it is more directly affected by point source pollution as a factor of rainfall. This may affect the level of debris accumulating onto the shoreline during CSO events, but the data are not conclusive.



Fig. 6 (above) | CSOs are a major source of pollution, pouring plastic debris, sewage and chemicals into NYC waterways.

Future Directions

Several updates to the data recording sheet are needed to adjust to the current uses of plastic products. Polyester textiles and shoes will be added, as microfibers are increasingly an area of high interest in the environmental science community. Six pack rings will be removed as they are no longer commonly found at cleanups. Differentiating foam vs plastic to-go cups and containers will also be helpful, keeping a careful eye on plant-based plastic products, or bio-plastics. Though bio-plastics are a step in the right direction towards sustainability, there is little evidence that they biodegrade faster than petroleum-based plastics, reduce harm to wildlife, or that they biodegrade at all if not composted properly. With multiple restaurants that provide take-out in the Park, it is imperative that the Park is equipped with up-to-date research and technology to support the Park's community and waters in eliminating plastic pollution.

References

New York State Department of Environmental Conservation. *Combined Sewer Overflow (CSO)*.
<https://www.dec.ny.gov/chemical/48595.html>

Office of Response and Restoration. (2010). *Marine Debris Tracker App*. US Department of Commerce, National Oceanic and Atmospheric Administration. <https://marinedebris.noaa.gov/partnerships/marine-debris-tracker>

Science History Institute. *History and Future of Plastics*. <https://www.sciencehistory.org/the-history-and-future-of-plastics>