HUDSON RIVER PK

Macroplastics Report 2019

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Purpose

Despite the Hudson River being much cleaner than it once was, marine debris remains a challenge negatively impacting the River's water quality and wildlife. In May 2019, Hudson River Park (HRPK) kicked off Park Over Plastic (POP), a Park-wide initiative to decrease single-use plastics through community engagement and education. In an effort to understand the impacts of plastics to NYC's local waterways, HRPK involves community volunteers in collecting and categorizing macroplastics (plastics larger than 1in.) from the Park's shorelines including Gansevoort Peninsula and a new site at Pier 76.

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 a100 meter shoreline (in red). Both sites are between Combined Sewer Outflows (CSOs), a source of marine debris.

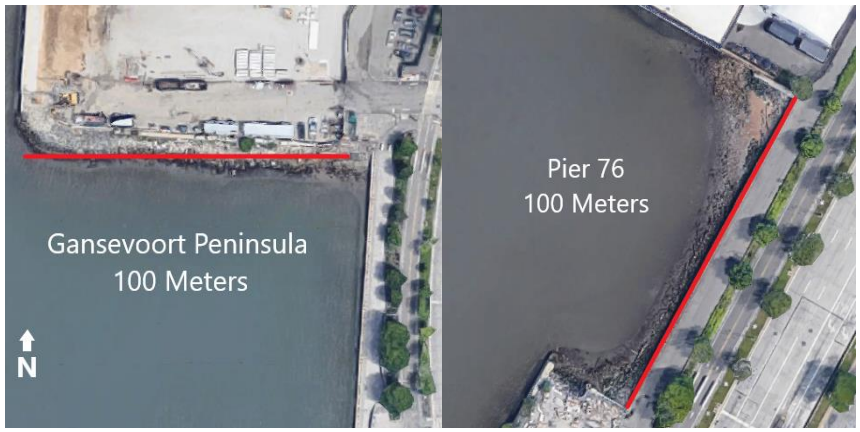

Fig. 2 (above) | Participants survey macroplastics in each transect of the Pier 76 shoreline by recording type, quantity, resin code and size of each plastic item collected.

Methods

- Surveyed 100m (in 10m transects) on the Gansevoort Peninsula and Pier 76 shorelines
- Recorded the count and category of plastic debris items over 2.55cm/~1in (bottle cap size) in each transect
- Recorded resin identification codes (RIC) if available and indicated when plastics are larger than 1 ft under the "Large Debris" section on the data sheet
- Recorded total weight of plastic debris collected in pounds (lbs) using a hanging scale
- Entered all plastic debris recorded by category and location into NOAA's Marine Debris Tracker app

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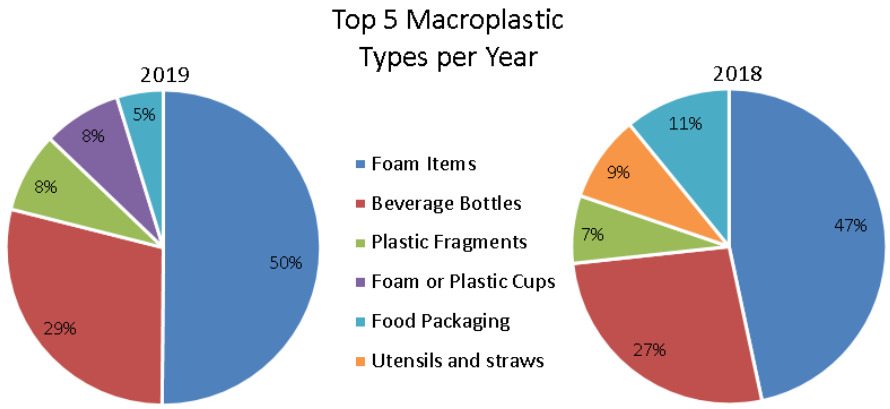
Major Findings

In 2019, 4,121 macroplastic pieces were counted and categorized and 555 lbs of marine debris were removed from Hudson River Park's shorelines from 8 monthly cleanups with the support of 63 participants. 110 lbs of that debris, almost 20%, was recyclable. Additionally, we found similar amounts of marine debris between the two sites even though Gansevoort had two clean ups, because there is less debris than past years, while Pier 76 had six clean ups.

- There were similar proportions of the top 5 types of macro plastics found between 2018 and 2019
- Foam items continued to be most common item collected, likely because foam easily breaks down into smaller pieces
- More marine debris was collected on Gansevoort Peninsula in 2 clean up days than at Pier 76 in 6 days
- Rainfall did not correlate to the amount of debris collected
- Of the plastics with a RIC visible, 87% of were type 1 (PET)

Fig. 3 (below) |Top 5 macroplastic types represented in our counts for 2018 and 2019. Utensils and straws were more common in 2018 while foam or plastic cups were more common in 2019. The remaining types had fairly similar percentages between the two years.



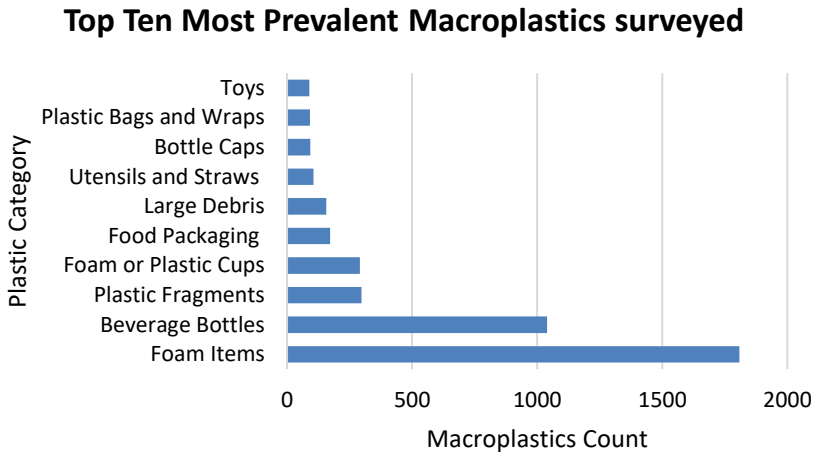
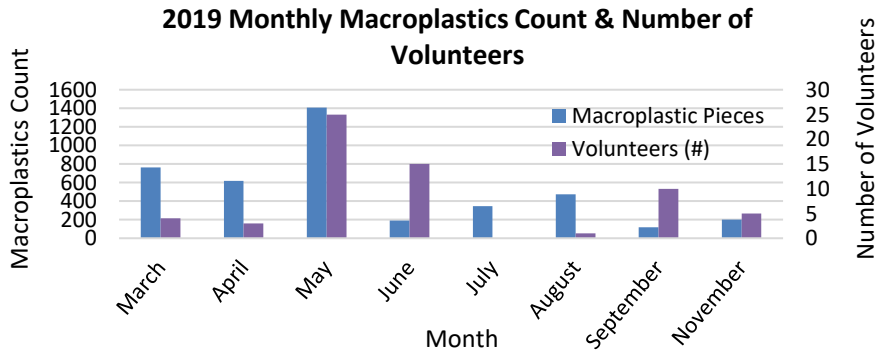


Fig. 4 (above) | Variety and number of macroplastics collected in 2019. Foam, beverage bottles and utensils/straws/cups were the top most frequent items collected.

- Foam was the most prevalent macroplastic collected at 1,808 pieces and beverage bottles was the second most at 1,039 pieces
- The month of May had the most debris collected at a total of 1,409 pieces at Gansevoort Peninsula and September had the least amount at 119 pieces at Pier 76

Fig. 5 (below) | Number of macroplastics collected per monthly cleanup. Concentration of plastics don't correlate with number of volunteers. July's cleanup involved only HRPK staff, not volunteers.



Take Aways

Regular shoreline cleanups are a meaningful way to survey marine debris, yet insufficient at reducing plastic pollution from NYC shorelines, due to its reactionary approach. The cleanups, however, provide useful data, innumerate the scope of the problem and highlight how plastic policy measures influence marine debris on our shorelines. Styrofoam was the most common plastic pollutant collected at Hudson River Park for the fourth year in a row and continues to be the most challenging to remove due to its brittle nature. Though there were fewer foam pieces in 2019 than in 2017 and 2018, this is more likely due to the fact that there were fewer participants at cleanups rather than the New York City Styrofoam ban making a noticeable impact. The majority of plastics found were PET, used in beverage bottles and food packaging. This is likely because the consumption of pre-packaged food and beverages is a major source of single-use plastic waste. The May cleanup collected the most debris due a high number of volunteers and because it was at Gansevoort Peninsula, which has a greater shoreline that is more accessible at higher water levels. Cleanups occurred more often at Pier 76 due to intermittent construction at Gansevoort Peninsula, likely affecting our total amount of debris collected.

Fig. 6 (above) | Participants at Hudson River Park's Gansevoort Peninsula for the River Sweep event.

Future Directions

Since launching Park Over Plastic, Hudson River Park has made notable advancements in reducing single-use plastics in the Park (i.e. increasing recycling bins, water bottle fillers, plastic alternatives for tenants and interactive public education). With these improvements in place, observing any impact of Park Over Plastic in CSO-derived marine debris will be a factor to look for in the coming years. As this initiative continues to grow, the Park will develop more opportunities for the general public to participate in shoreline cleanups thereby removing more debris from the Park's shorelines and strengthening our plastics database. Gansevoort Peninsula will potentially continue to be an ideal site for shoreline cleanups after the construction is completed. New methods of measuring marine debris in the Hudson River such as an aquadrone that removes debris from the River surface, called WasteShark, is also a possibility in the future. After 2020, a comparison of the past five years' data will be made to glean any changes in trends of debris on Park's shorelines over time.

References

- https://www.sciencehistory.org/the-history-and-future-of-plastics
- https://www.riverkeeper.org/campaigns/stop-polluters/sewage-contamination/cso/
- http://plastic-pollution.org/