



Hudson River Park

# Hudson River Park

Established 1998



Hudson River Park

## Who:

Hudson River Park is a 550-acre park and estuarine sanctuary from Chambers Street to W. 59<sup>th</sup> Street in Manhattan. It includes four miles of waterside esplanade, 16 reconstructed public piers to date, four dedicated boat houses for sailing, rowing, and paddling, and numerous other places to play, learn, and relax. In the Environment and Education Department, we work to communicate the River's vital ecological role to everyone from school children to the general public, serving more than 27,100 people in 2017.

## What:

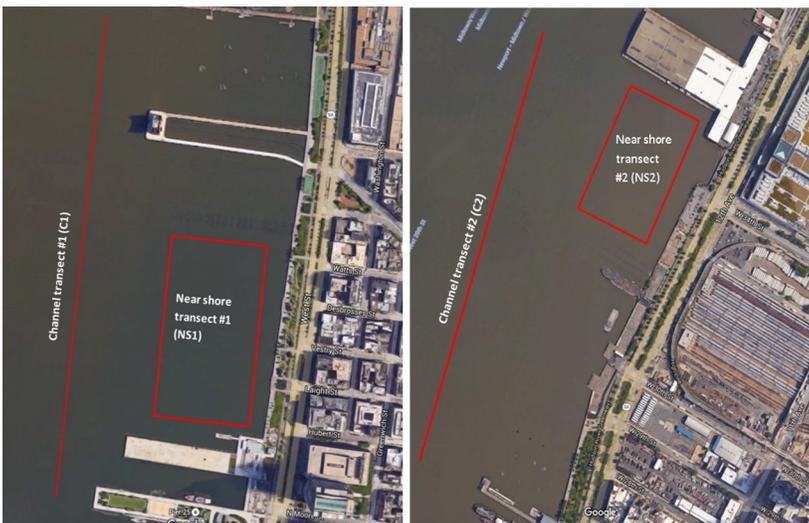
The objective of this study is to obtain baseline microplastic concentration data for the Lower Hudson Estuary within Hudson River Park and to determine how these concentrations compare to data from 2016 and fluctuate based on proximity to shore and combined sewer outflows.

## Where:

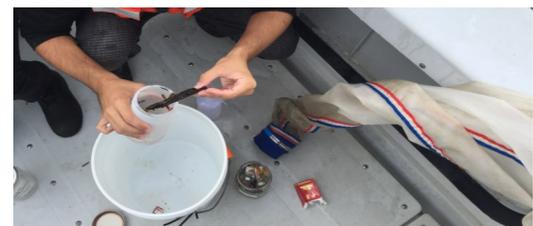
Sites were located within Hudson River Park's sanctuary waters at both channel and near shore locations. The first site was downtown by Vestry Street and the other was in midtown by 34<sup>th</sup> Street.

## When:

Monthly samples were collected June to October 2017. The month of September was skipped due to boat access and scheduling issues.



(Above) Satellite images of trawling sites at both Channel and Near Shore locations within Hudson River Park's downtown and midtown waters.



(Above-top) Hudson River Park staff examine a sample jar containing microplastics and marine debris matter.

(Above-below) Samples transferred to mason jars for processing.

(Left) Hudson River Park staff and Brooklyn College students use hydrological instruments to record water, site, and weather conditions.



## How:

At each site two samples were collected at channel and near shore locations. The samples were collected using a 0.3mm (300 µm) mesh, surface trawling neuston net. To standardize regional methods and data for the New York City area, this study aligned procedures with other local microplastic projects and followed laboratory methods as defined by NOAA. Trawl time was reduced to 15 minutes to account for the relatively high flow rate of the Lower Hudson. Processed samples were counted and categorized under a dissecting microscope in three sizes (0.3-1mm, 1-5mm, and >5mm). Microplastic categories expanded this year to distinguish nurdles from fragments resulting in six classification types: nurdle, fragment, pellet, foam, line, and film.

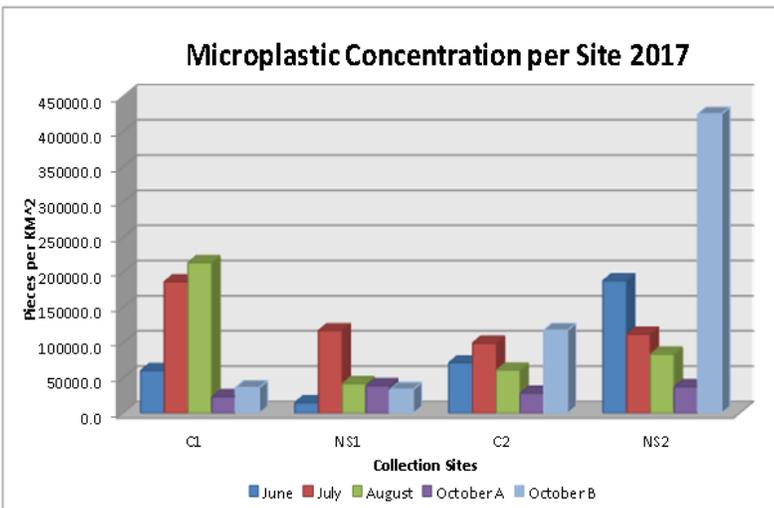


**(Left)** Processed samples at 10x magnification under dissecting microscope.

Far left highlights a variety of microplastics including line (green); middle shows a sample dominated with fragments, and right exhibits a sample with numerous pellets.

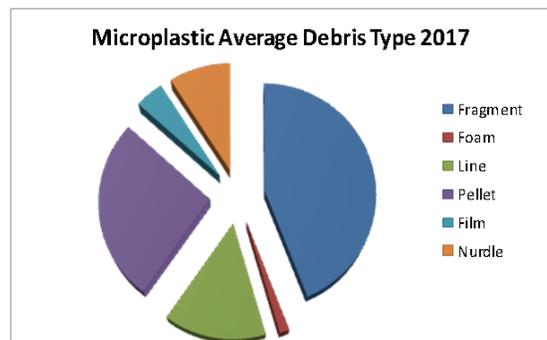
## Results:

The average microplastic concentration within Hudson River Park's waters during the 2017 season was 99,692 pieces/km<sup>2</sup>. This concentration is fifty percent lower than last year's average of 188,657 pieces/km<sup>2</sup>. This may be because 2017 was a particularly dry summer. Although there was some rain accumulation within a 4 day period before all of the trawl dates, only in June 2017 did rain reach an inch. There are notable, but not significant, differences in concentrations found between channel and near shore sites and between the midtown and downtown locations. This finding is consistent with there being little rain and therefore fewer CSO events around trawling dates. Near shore site two, located in midtown, saw a great amount of plastic in the second October trawl. This finding may be due to the large number of microplastics clinging to the abnormally large amount of leaf and wood debris in the net and then rinsed into the collection jars. Similar to 2016, Fragments were the dominate (45%) type of microplastics identified in the samples, even with distinguishing nurdles (9%) as its own category separate from fragments.



**(Left)** Microplastic concentrations for five monthly trawls at downtown (1) and midtown (2) channel and near shore sites

**(Below)** Average abundance of microplastic categories



## Conclusion:

This study furthered Hudson River Park's microplastic monitoring initiative within its estuarine sanctuary. Although 2017 microplastic concentrations varied from 2016 microplastic concentrations, findings reinforce that rain is a strong predictor for increased plastics within nearshore areas. Our intent is to lead a multi-year microplastics study to gain better understanding of changing microplastic concentrations. It is within the Park's mission to ensure that our waters are protected and restored. We hope that this study contributes to the growing body of regional microplastic data that will inform future inquiry and policy.

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