



# ENTEROCOCCUS IN THE HUDSON RIVER

## INTRODUCTION

Enterococcus is a fecal bacteria that comes from stormwater runoff and untreated wastewater, discharged from New York City's combined sewage overflow (CSO) system. During precipitation events, the system can become overwhelmed and release raw sewage into waterways. The Hudson River has high concentrations of municipal waste. Fecal bacteria are among the significant contaminants in wastewater. At W. 129th Street there is a CSO that discharges sewage from the North River Wastewater Treatment Plant. Bacteria concentrations in the Hudson River at 125th Street routinely exceed EPA water quality standards. We expect that increased precipitation causes increased fecal bacteria due to increased stormwater runoff overwhelming CSOs. High levels of enterococcus have major public health implications. Pathogens indicated by presence of enterococci can cause gastrointestinal diseases in humans.

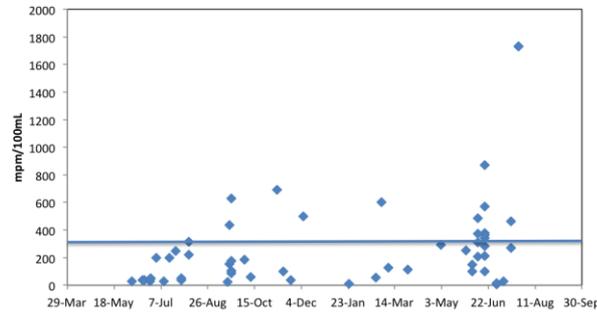
## GOALS

Determine:

- Enterococcus concentrations in the Hudson River at 125th Street
- Whether bacteria levels correlate with other variables such as precipitation, salinity, suspended matter, and temperature

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Undiluted Enterococcus Levels at 125th St. at the West Harlem Pier in 2013



## METHODS

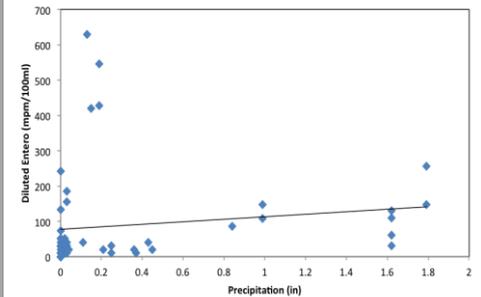
*Field data was collected at the 125th Street West Harlem Pier.*

**YSI, Secchi Disk:** used to record water conditions such as temperature, salinity, and conductivity.

**Suspended Matter:** 1 L of river water was passed through .45  $\mu\text{m}$  glass microfiber filters to measure difference by weight.

**Bacteria:** Analyzed bacteria cultures using Enteroalert and Colilert to test for enterococcus and total coliforms

Diluted Entero Vs. Precipitation over 72 Hours



## CONCLUSION

Fecal bacteria were detected in 100% of the samples collected.

- Enterococcus concentrations ranged from 0-1119.9 MPN with an average 185.2 MPN
- Coliform concentrations ranged from 214.3-2419.6 MPN with an average of 1479.5 MPN
- Statistically significant correlations were not found between enterococcus and precipitation

## FUTURE WORK

The expected correlation between bacteria and precipitation was not found. Therefore there must be other variables at play besides CSO. Given that river sediment can act as a sink for bacteria, further research could investigate the relationship between sedimentation and resuspension of bacteria.