

# THE INFLUENCE OF HUDSON RIVER WATER QUALITY ON FISH BIODIVERSITY

## INTRODUCTION

The Hudson River was polluted for decades by industrial and commercial waste, leading to toxic levels of pollution that adversely affected the biodiversity of its inhabitants. Decreased biodiversity leads to a more fragile ecosystem that is less likely to recover from changes in the environment.

## METHODS

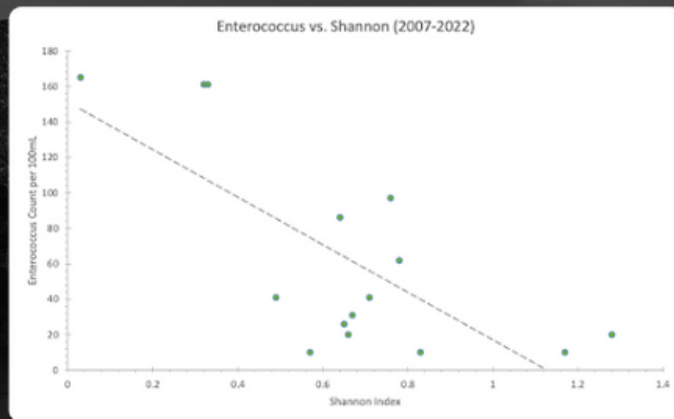
To research biodiversity, we utilized the 2022 BioBlitz fish data and also Hudson River fish data from 2007 - 2022. To determine water quality over time, we used data with enterococcus counts of the Hudson over time. We filtered out the species found in NYC estuaries and observed the correlation of water quality and biodiversity over years based on those species.

## RESULTS

We observed a strong and statistically significant negative correlation between enterococcus count and the Shannon index,  $r(16) = 0.715$ ,  $p = 0.002$ .

## CONCLUSIONS

A cleaner river may encourage more people to visit the area and engage in outdoor activities along the riverbanks, bringing in more money for local NYC businesses. People who live in or close to the city may have fewer health concerns as a result of less pollution in the Hudson River. Less exposure to dangerous pollutants may result from cleaner water. A cleaner river will offer locals access to natural areas for leisure and relaxation as well as a more comfortable living environment, as well as preserving the rich biodiversity of NYC as a whole.



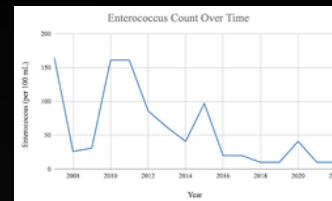
**Less water pollution is correlated with increased biodiversity in the region**

The figure above displays the relationship between the enterococcus count and the corresponding Shannon index of the Hudson River estuaries for that year. As exhibited by the trend line, a strong negative correlation exists between the two, signifying that lower enterococcus presence is associated with a greater index.

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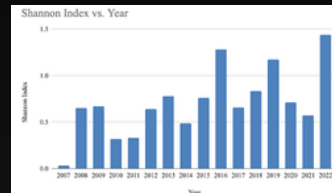
## SUPPLEMENTAL DATA

Figure 1



1. Enterococcus count refers to a bacteria that is utilized as a proxy for water pollution. A steep decline is evident from 2007-2022 due to conservation efforts.

Figure 2



2. The Shannon index is a common measurement tool for biodiversity and since 2014, the calculations for the Hudson River estuaries have nearly doubled. The higher the index, the more biodiversity present.

## FUTURE RESEARCH

Considering the monetary and time-related constraints, this study is limited to solely one portion of the Hudson River. More than that, there is more biodiversity to analyze within the immediate environment of the river, including the plant life along the shores. Next steps would consist of scaling the study and expanding its horizon to encapsulate more variables.

## WORKS CITED

