

Enterococci in the Hudson River: Sources of Contamination at 125th Street

Environmental Issues and Policy Recommendations for the Waterfront

Development in Manhattanville

K. Farrell, C. Kelly, P. Bower

Barnard College Dept. of Environmental Science

Introduction:

The purpose of this project is to determine Enterococcus levels in the Hudson River. Water samples are taken and tested for Enterococcus as well as Total Coliform and E.coli. All water samples are collected at the 125th St. West Harlem Piers Park. The project analyzes Enterococcus levels in the river in relation to a variety of different factors (recent rainfall, water/air temperature, salinity, tides/currents, time of year, etc.). Enterococcus levels are compared to the federal EPA standard for marine water provided by RiverKeeper (RiverKeeper 2011). The influence of the nearby North River Sewage Treatment Plant is also a significant aspect of this project seeing as Combined Sewage Overflow may lead to increased Enterococcus and *E.coli* levels in the Hudson River.

Methods:

Bacteria: Culture-based analysis using Enterolert™ and Colilert™ (Idexx Laboratories) to test for Enterococcus, *E. coli*, and total Coliforms.

Suspended Matter: 1 Liter of river water was passed through 0.47 µm glass microfiber filters.

Water Conditions: YSI was used to record water conditions including temperature, conductivity, dissolved oxygen, pH, and barometric pressure. Secchi disk was used to test turbidity.

Field Materials

Professional Plus YSI

Secchi Disk with metered line

Bucket with rope

2 Glass Bottles/Jugs

Funnel

Sampling Data Sheet

Pen

Medium Cooler

Lab Materials

2 Pipettes

Pipette bulb

4 labeled sampling vessels

4 labeled Quanti trays

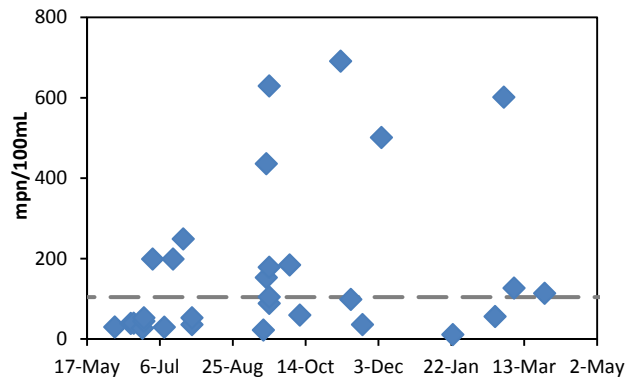
Filter

Tweezers

Weigh boat

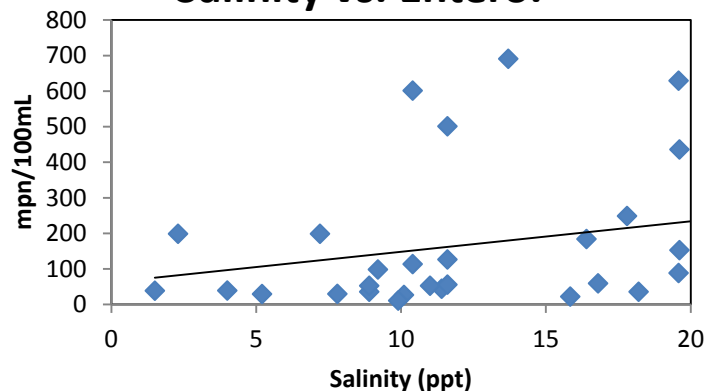
Gloves

Undiluted Entero.



◆ Undiluted Entero (mpn/100mL)
— Federal Marine Entero. Standard

Salinity vs. Entero.



Conclusions:

- Fecal bacteria is ubiquitous in the Hudson River
- 43% of the samples were above the federal standard for unacceptable water quality (>104 mpn/100mL)
- Bacteria was detected in all samples collected from May 2013-March 2014
- No apparent patterns exist with measured controls.
- No correlation was found between Enterococcus levels and salinity, water temperature, precipitation, tide height, or turbidity.

Future Work:

- Samples will continue to be taken on a weekly basis throughout the spring and into the summer of 2014.
- All samples will be analyzed using the same techniques.
- Causes of fluctuation in Enterococcus levels will continue to be investigated. Is it Combined Sewage Overflow? Sediment perturbation?

References:

Brown, Tracy. (2011). How is the Water? Sewage Contamination in the Hudson River Estuary. *Riverkeeper*. Retrieved on 7 April 2014 from http://www.riverkeeper.org/wp-content/uploads/2011/08/RvK_How-Is-the-Water_2006-10.pdf.