

Fecal Indicators and Sediment in The Milwaukee River Watershed

Abraham Gonzalez, Jill S. McClary, Ryan J. Newton
 School of Freshwater Sciences, University of Wisconsin-Milwaukee

Introduction

- The Milwaukee River watershed is impaired by fecal bacteria and sediment pollutants.
- With new regulations the municipalities will be required to control their levels of both fecal bacteria and sediment in their storm water discharge.
- It is important to know if sediment and fecal bacteria are connected and how they are transported through the watershed so they can be mitigated.

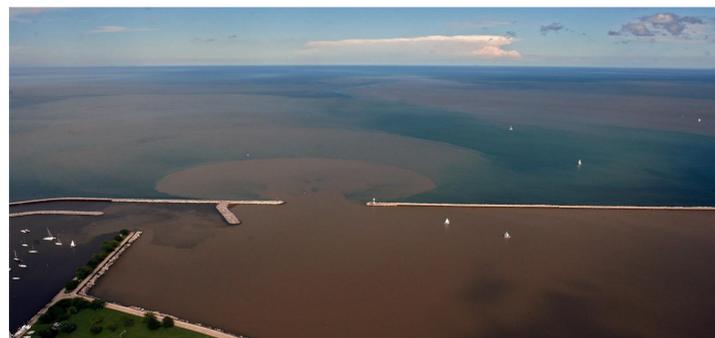
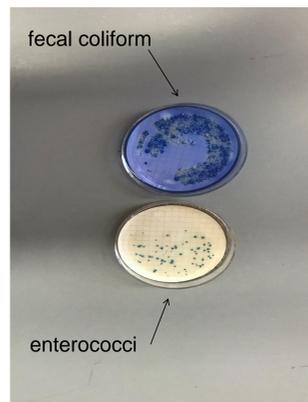
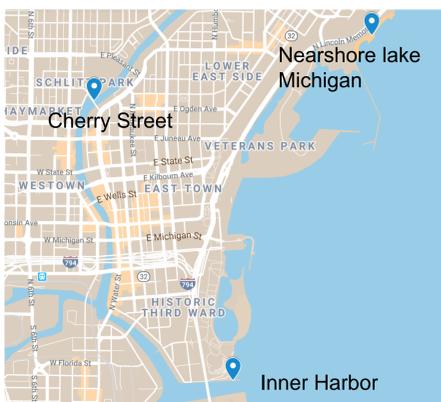


Photo credit: Mark Was, Milwaukee Journal Sentinel

Research question: if there is a rain event in the Milwaukee River, there will be an increase in *Escherichia coli* in sediment.

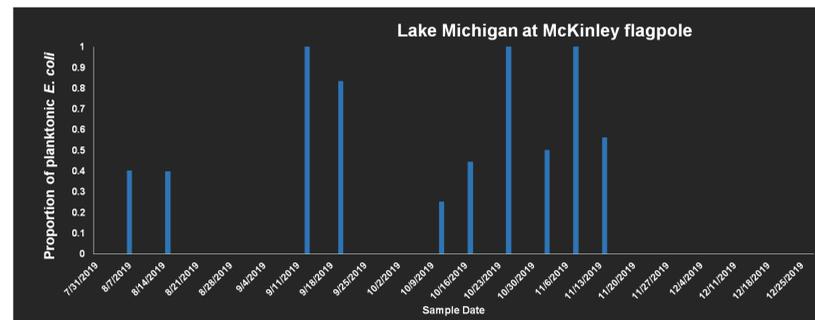
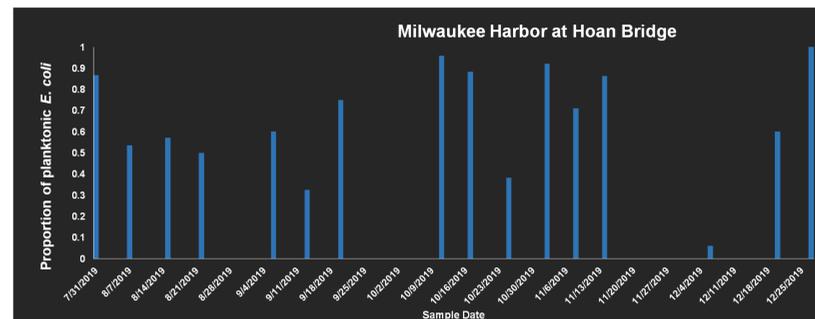
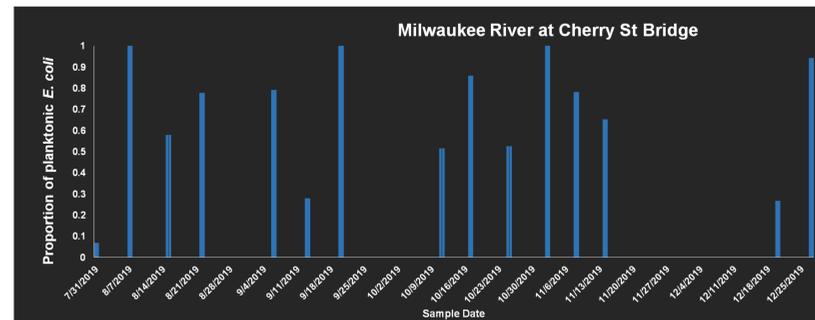
Methods

- Sample collection** from three sites: The Milwaukee River, Milwaukee inner harbor, and nearshore Lake Michigan.
- Each sample was divided into two subsamples: one sample was filtered through a 3- μ m filter and the other subsample was left unaltered.
- Sample processing:** processed through a sequential filter with standard sterilization methods.
- Using fecal coliform, enterococci, and *Escherichia coli* as a quantifying measure
- Plated on agar to also show CFU counts
- DNA samples collected for later use: DNA extractions

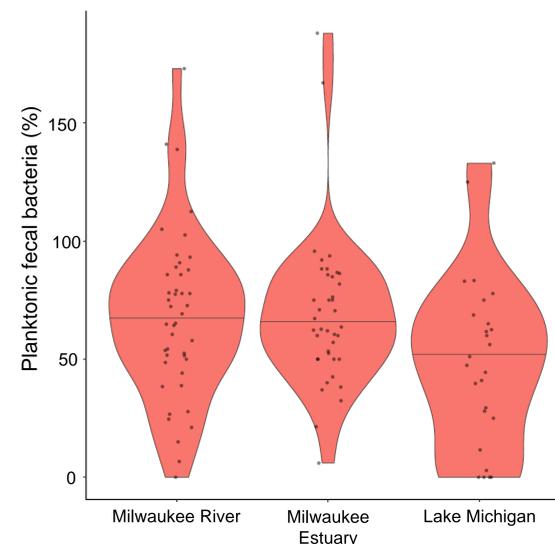


Results

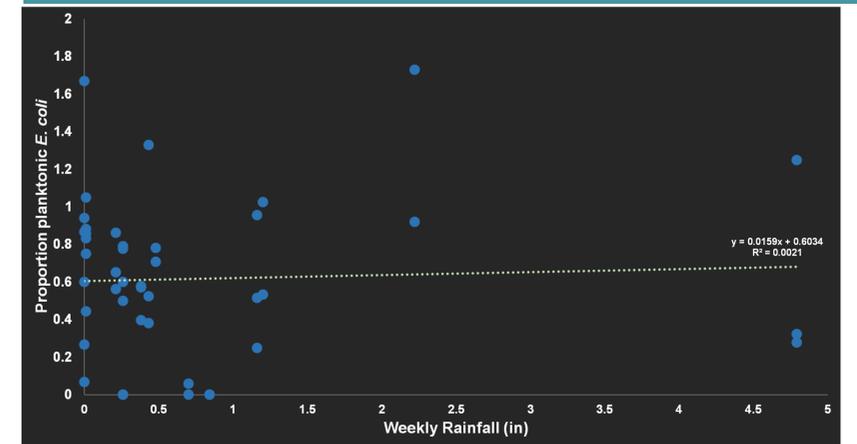
The fraction of planktonic *E. coli* was highly variable across sites and sampling times



On average, the majority of fecal bacteria were not particle-attached, and the fraction of particle-attached fecal bacteria was slightly higher in Lake Michigan (51%) than the river or harbor (32%).



Results

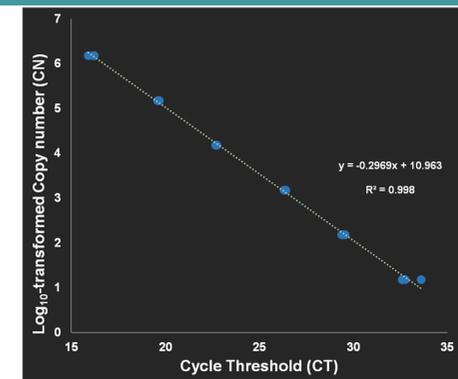


This variation was not driven by precipitation, as there was no relationship ($R^2 = 0.002$, $p > 0.05$) between rainfall and the percent of planktonic bacteria.

Conclusion

FIB in the Milwaukee river watershed are largely planktonic and expected to have different transport than sediment in the system.

Future Work



This graph shows the standards run for the tracer markers for qPCR analysis from the samples collected giving us a good start for further qPCR analysis for summer 2020

Acknowledgements

This project was supported by Newton labs and the SURF Award that was provided by the University of Wisconsin-Milwaukee.