

Citizens of the Rivers and Lakes Monitoring Program

Clean Rivers, Clean Lakes Conference

April 26, 2018

**Todd Miller, Zac Driscoll, Cheryl Nenn, Tim Vargo,
Joe Piatt, Val Klump, Jessica Orlando, Matt Hughes.**



Project Goals

- * Develop a *citizen monitoring program* to engage Milwaukee youth and adults to increase our awareness and connection to the lake and its tributaries.
- * Employ a set of *state-of-the-art analytical capabilities* to detect a wide variety of compounds of human origin in our local waterways.
- * Develop broader *community awareness and education* through visualizations, static and interactive maps, social media outlets of how our behavior impacts our waters.



Categories of Emerging Contaminants



Personal Care Products



Pharmaceuticals

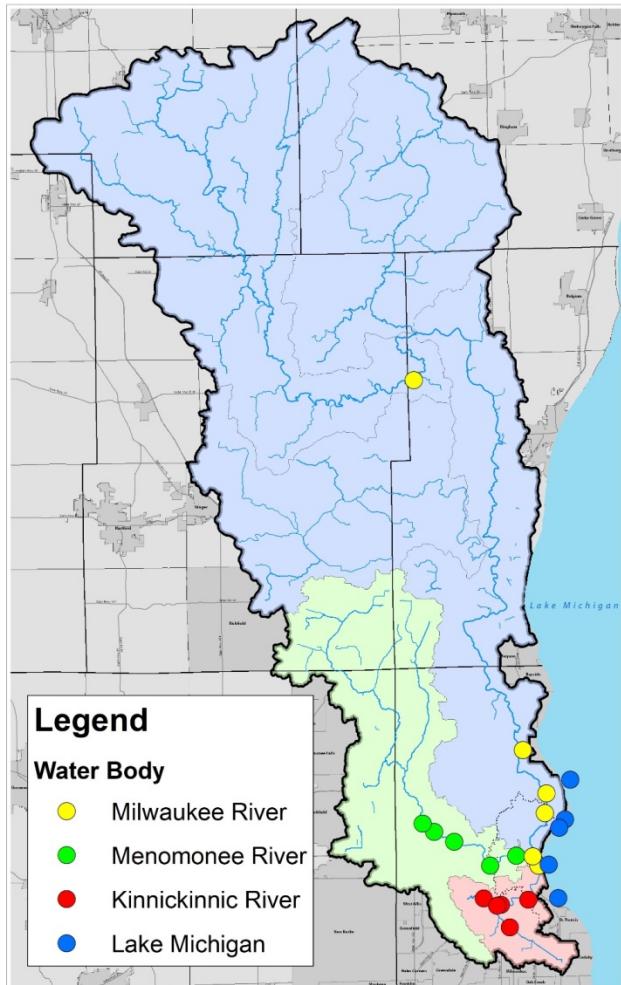


Recreational Drugs



Herbicides/Pesticides

Sample Sites



3 Rivers

- Milwaukee (5 sites)
- Menomonee (6 sites)
- Kinnickinnic (5 sites)

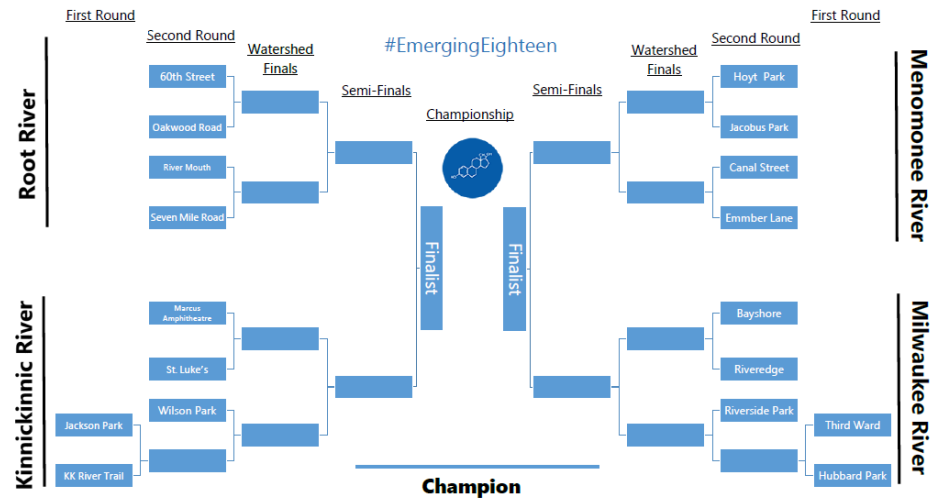
16 River Sampling Sites

4 Harbor & Lake Michigan Sites

Volunteer Recruitment



2018 Emerging Eighteen Water Sampling Event Bracket



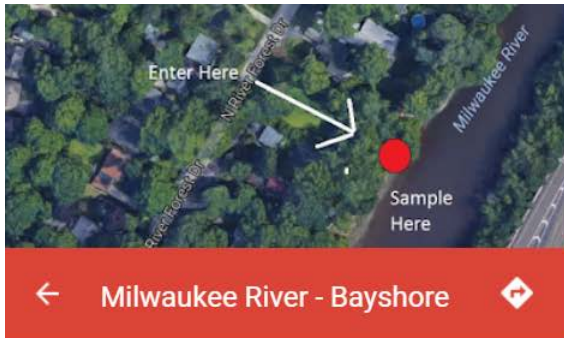
PROJECT PARTNERS:



MILWAUKEE



Volunteer Recruitment



Site Name

Milwaukee River - Bayshore

Sign Up For This Site

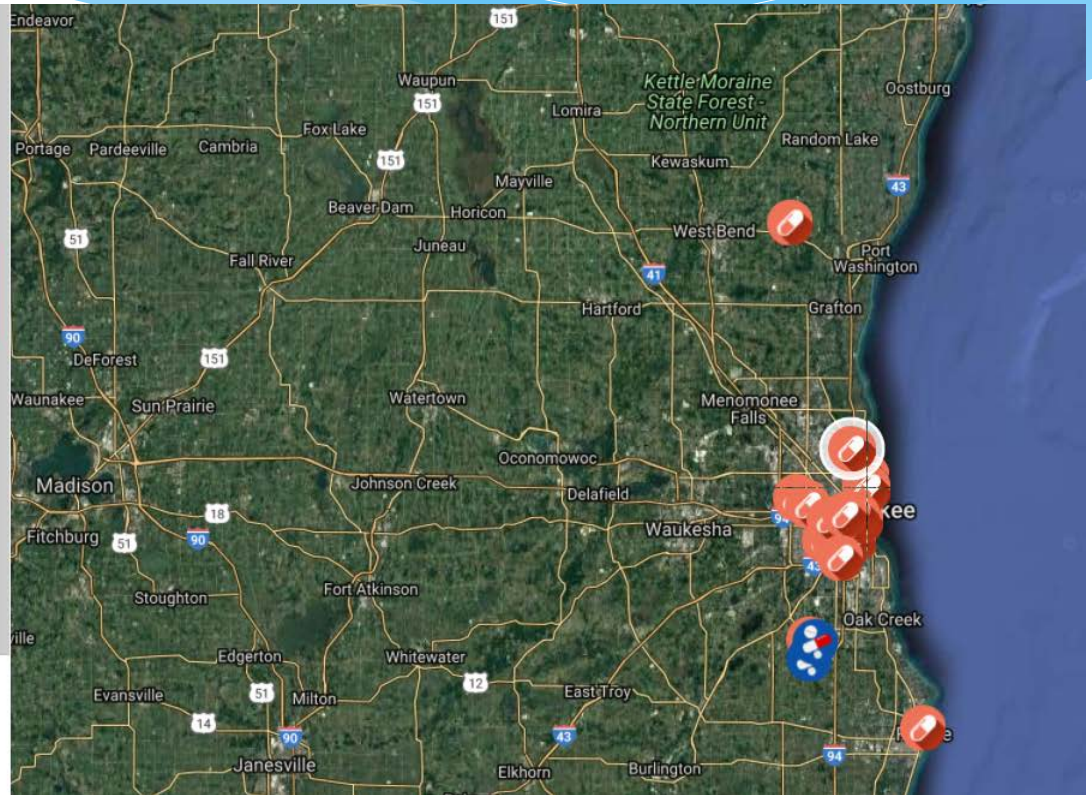
<http://milwaukeekeeper.force.com/volunteerEventRegisterPage?cid=7013A000000ij4S>

Site Code

MK2

Latitude

43.1211228



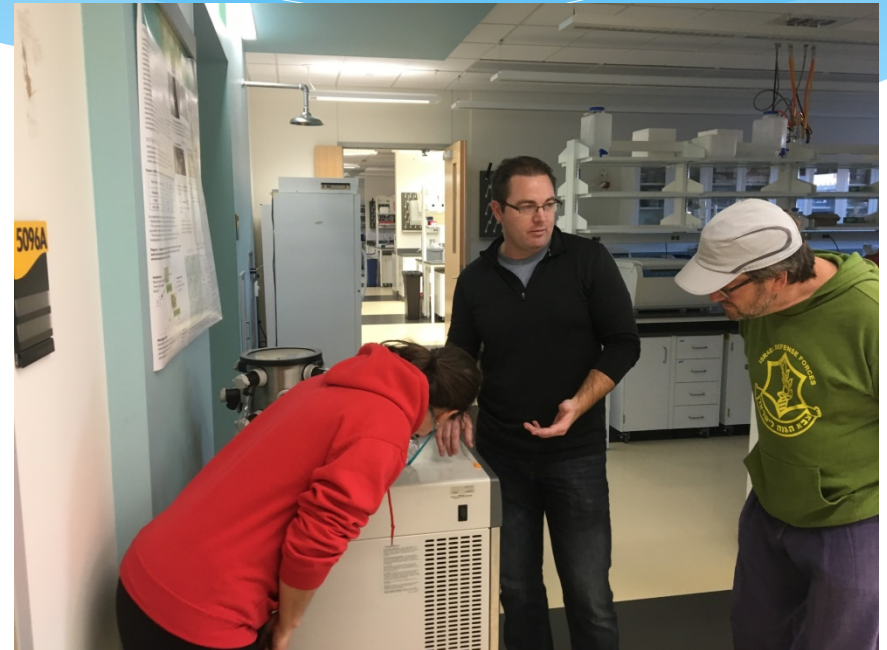
Water Sampling

- * Time Series
 - * 2 Sites – Samples collected weekly
- * Sampling Events
 - * Spring, Summer, Fall
 - * All Sites Sampled
 - * Volunteer Based
 - * Late summer 2016-spring 2018

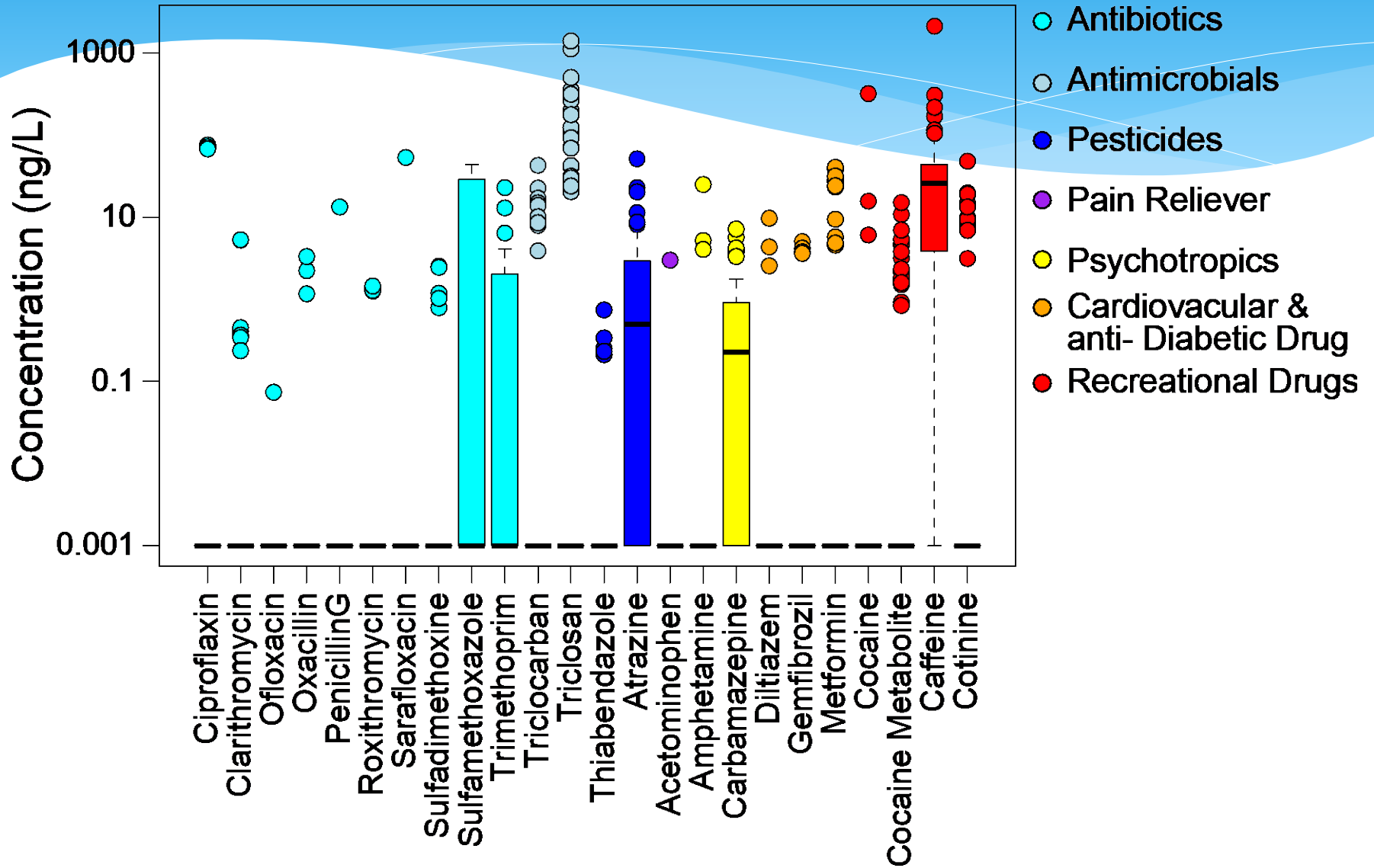


Sample Processing

- * UW-Milwaukee
 - * Dr. Todd Miller
- * Mass Spectrometer
 - * Analyzed for 63 compounds
- * Volunteers help process samples

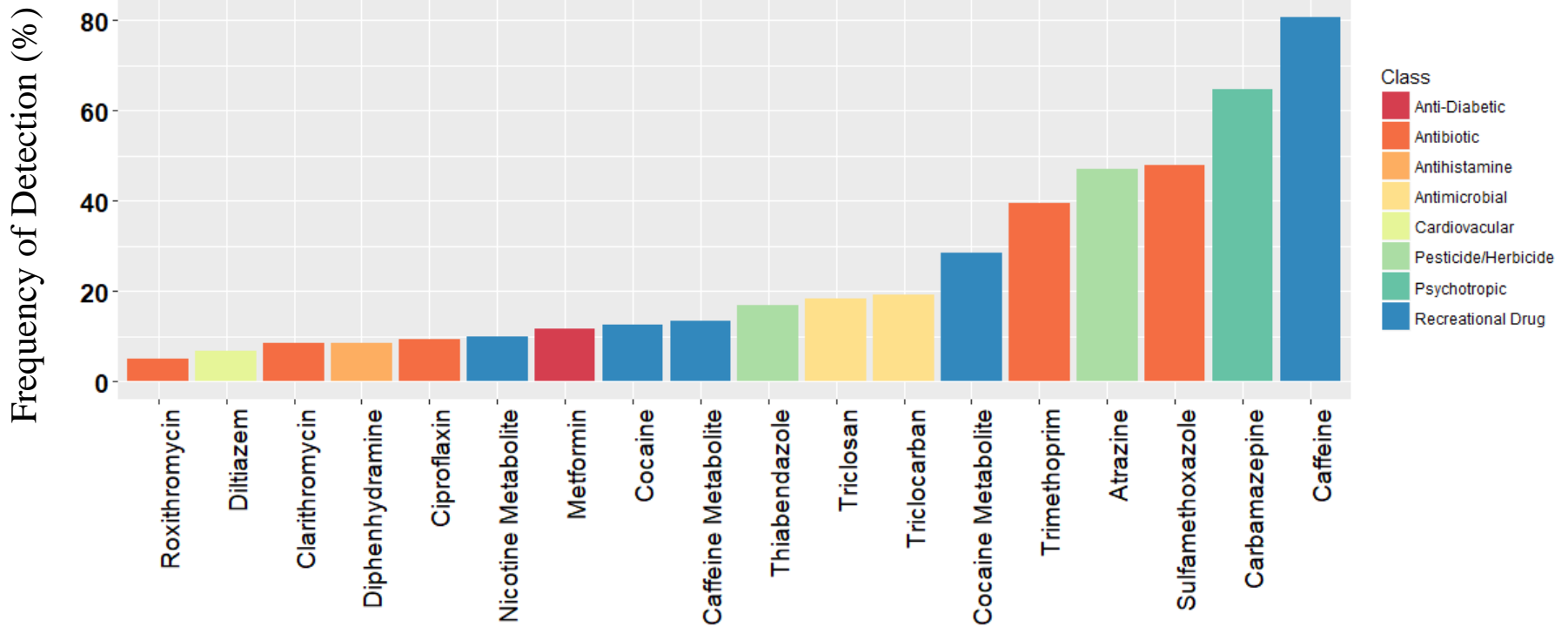


Anthropogenic Waste Indicators in the Milwaukee Estuary



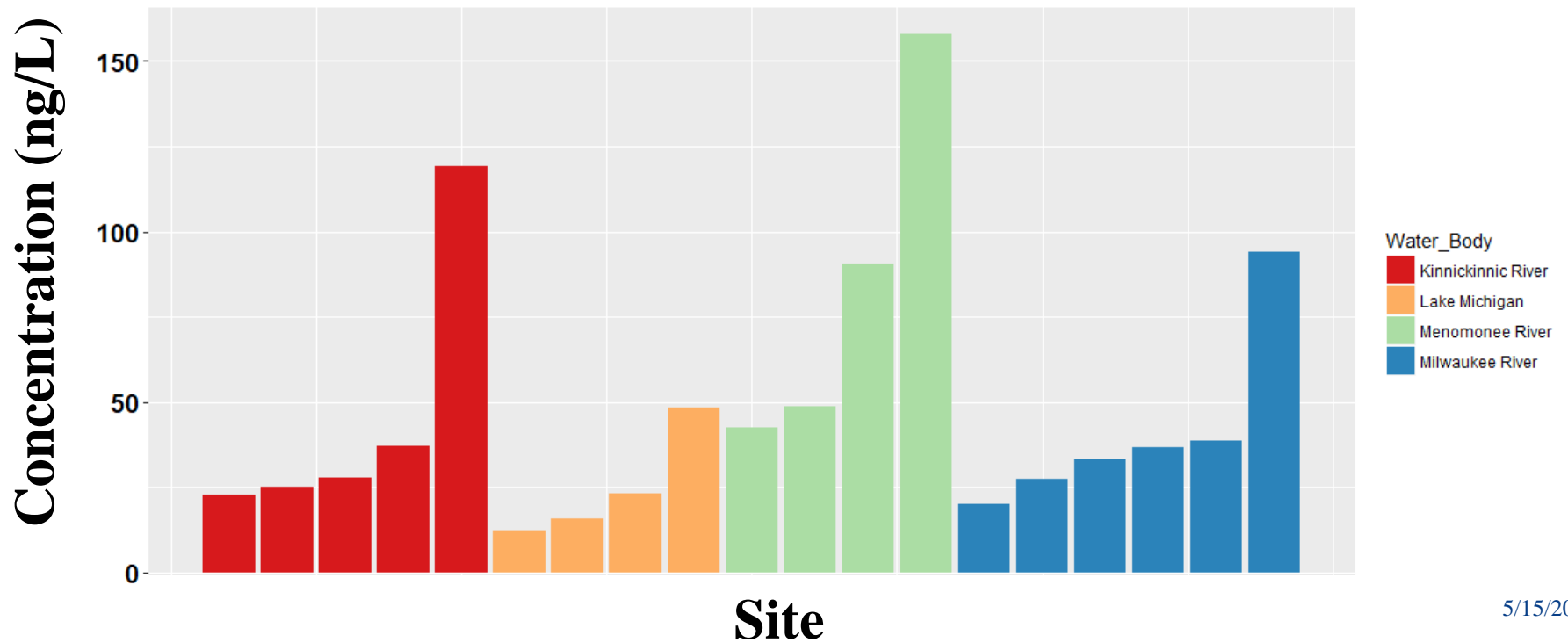
Results

Most Commonly Observed Compounds

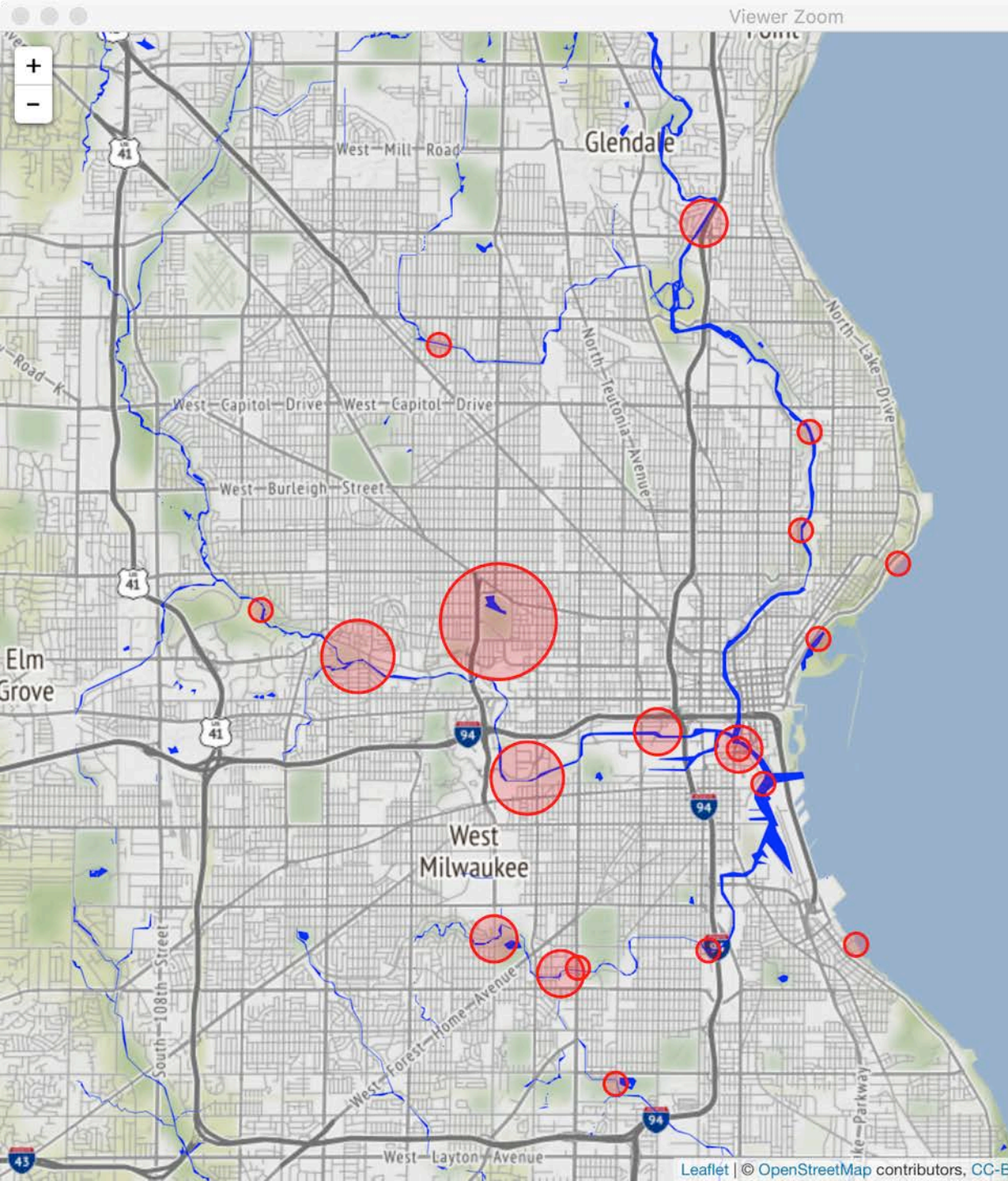


Results

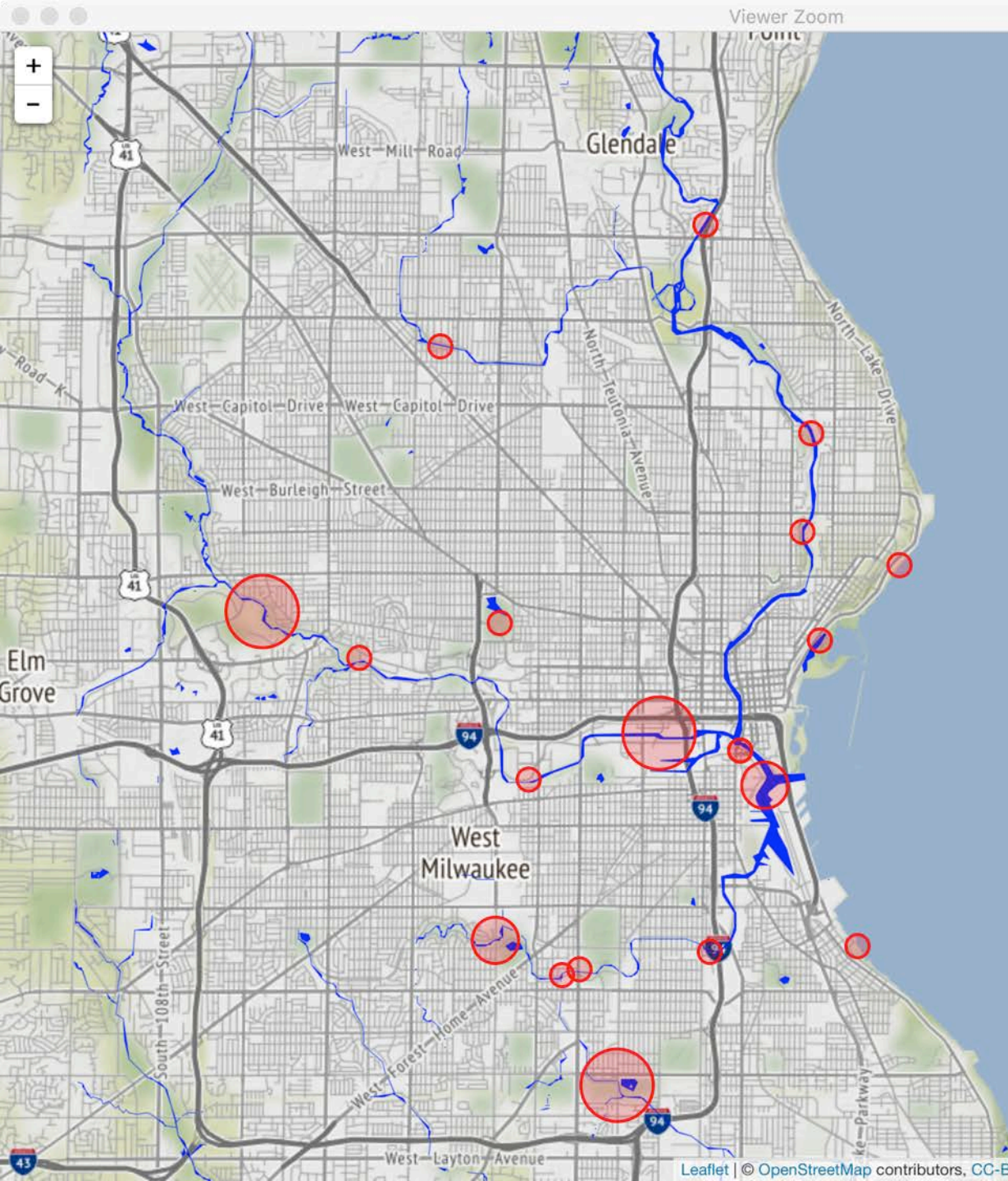
Mean Caffeine Concentration by Site



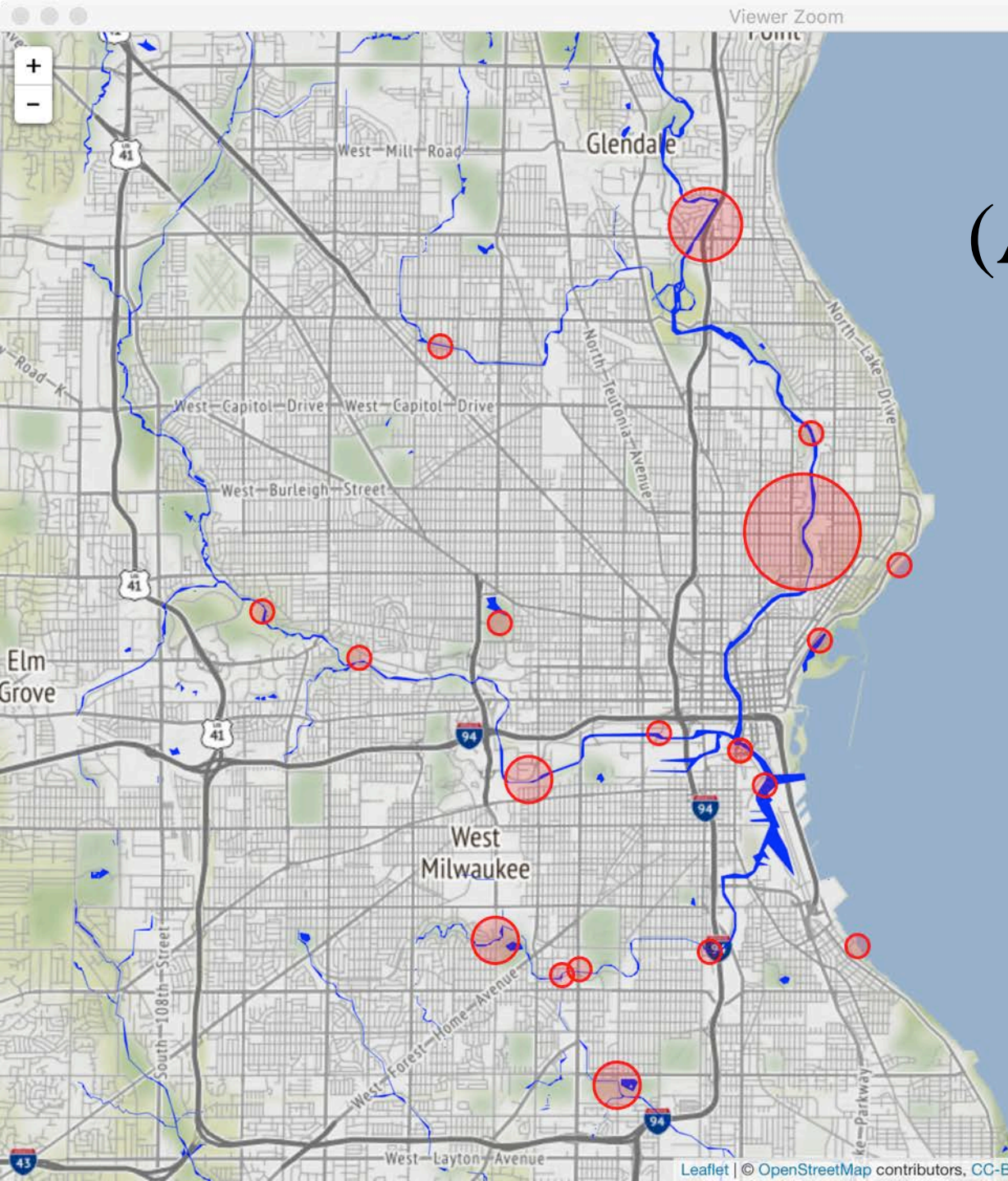
Caffeine (Stimulant)



Atrazine (Herbicide)

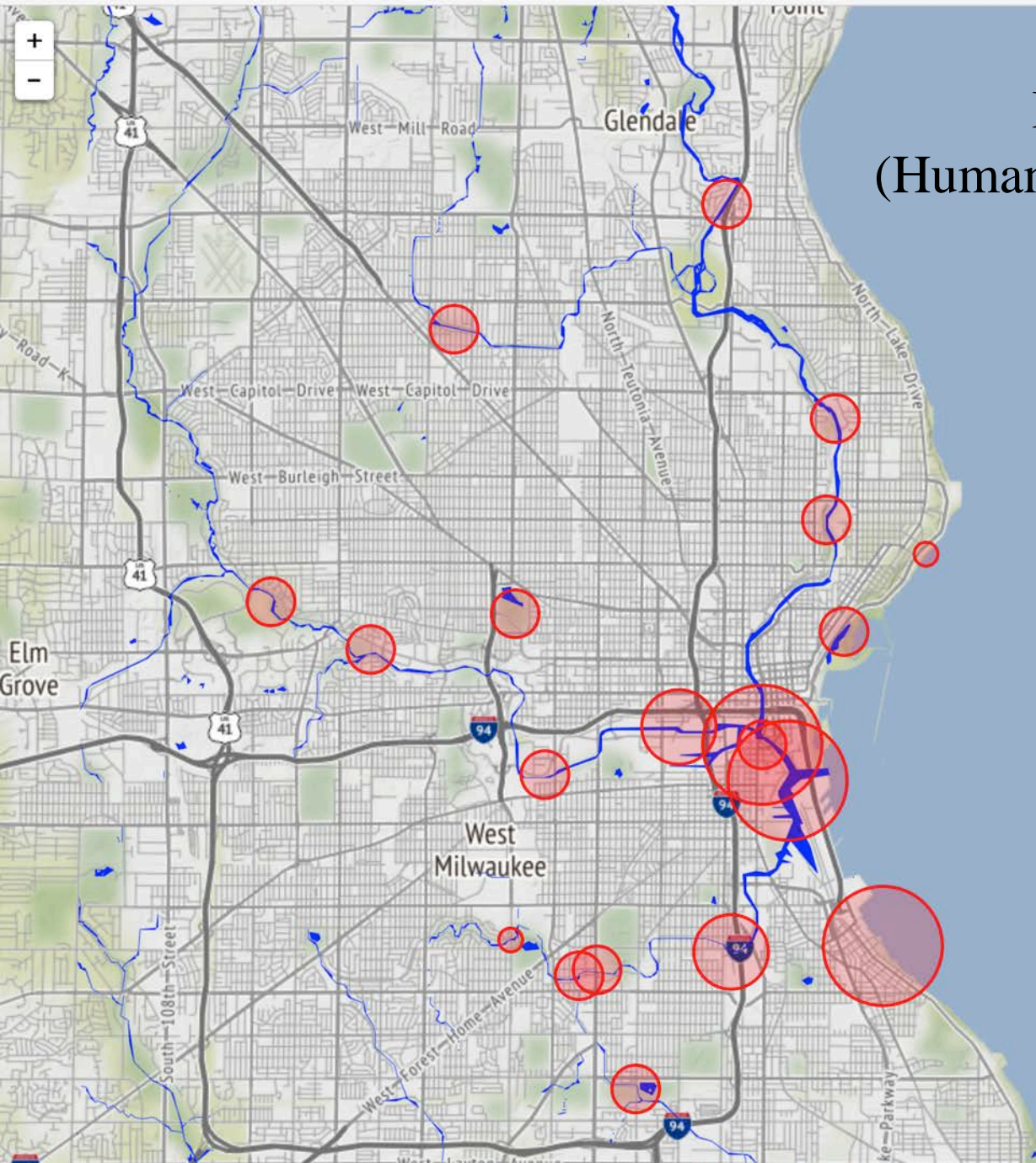


Triclosan (Antimicrobial)



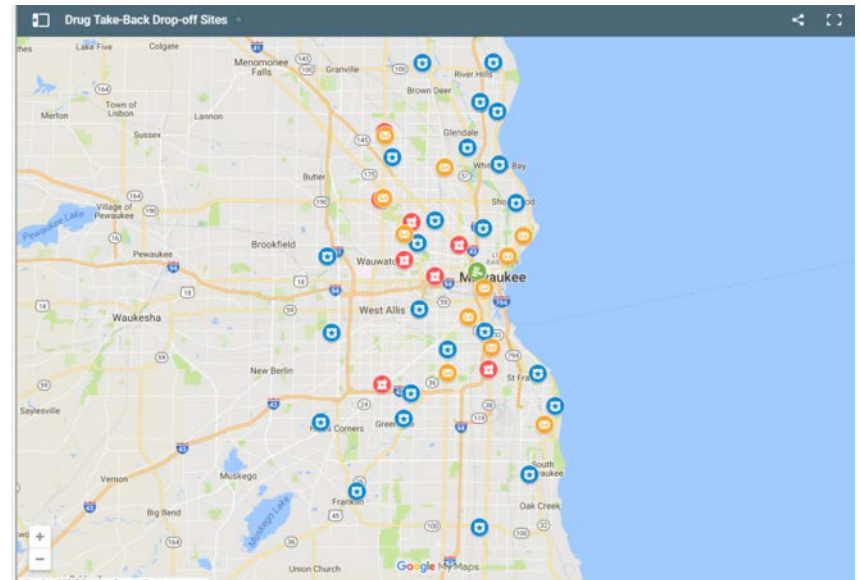


Benzoyllecgonine (Human Metabolite of Cocaine)



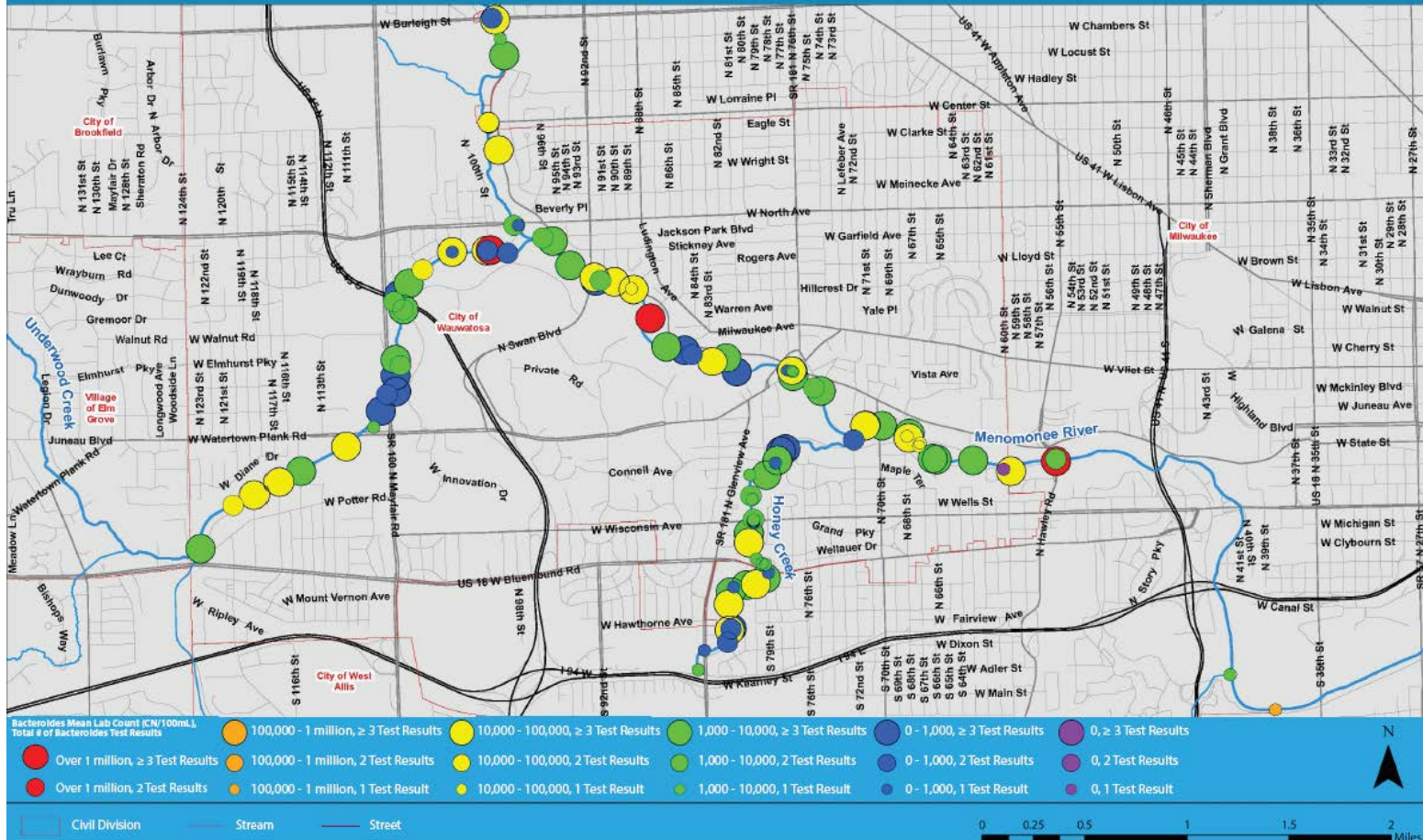
Results Summary

- * Many Compounds Observed
 - * Recreational Drugs
 - * Antibiotics
 - * Seizure Medication
 - * Herbicides
- * Compounds Found At All Sites
- * Involved over 45 volunteers
- * Created framework for mobilizing volunteers
- * Good press coverage
- * Complements other local efforts-drug take-back efforts and opioid addiction work
- * More education needed!!



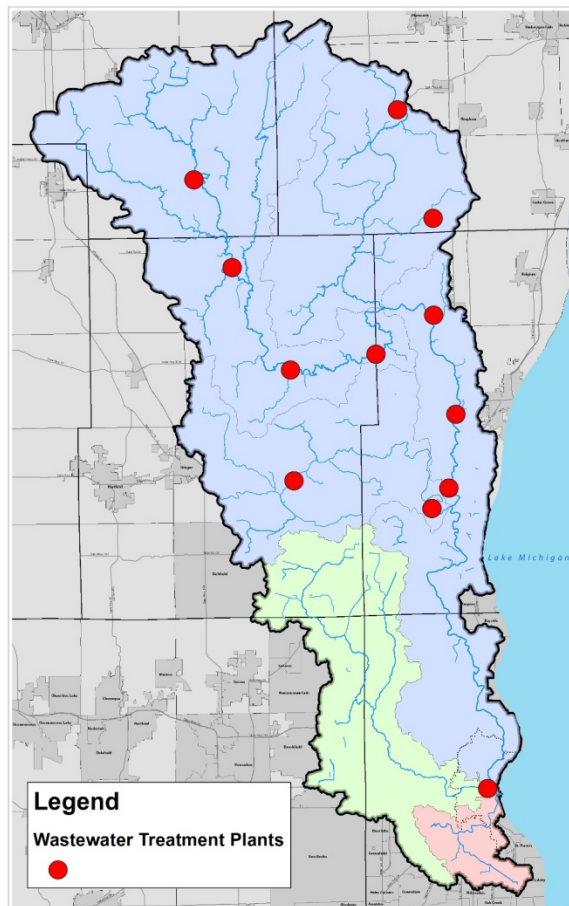
Likely Sources Illicit Discharges and Failing Infrastructure

Menomonee River Watershed Stormwater Outfall Human Bacteriodes Results 2008 - 2016



Likely Sources

Wastewater Treatment Plants and Septic



Acknowledgements



Fund for
Lake Michigan

Clearly making a deep impact.



- * Milwaukee Riverkeeper: Cheryl Nenn, Zac Driscoll, Kelly Ostrenga, Joe Fitzgerald
- * Urban Ecology Center: Tim Vargo, Tony Garcia, Jessica Orlando, Matt Hughes
- * UW-Milwaukee: Dr. Todd Miller Lab, SFS Support Staff, Val Klump
- * Carroll University: Joe Piatt, Rachel Kutzner, Allison Tomczyk, Kimani Njoya, Kaitlyn Chao