Environmental and Water Resources Engineering Seminar Series Presents:

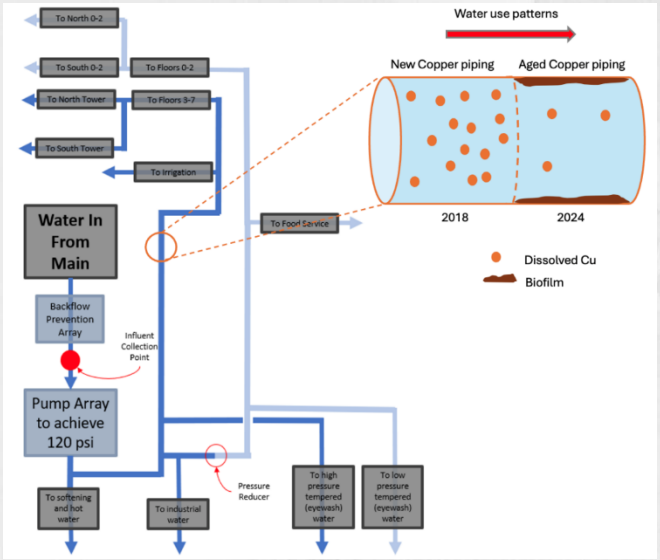
Thursday, April 18th 2024, 3:30-4:30pm, CPE 2.218

Effects of premise plumbing systems on drinking water quality in a multistory academic

Mila Otegui

Most Recent Degree: Bachelor of Science in Chemical Engineering, National University of Mar del Plata, 2019

Advisors: Dr. Lynn Katz and Dr. Kerry Kinney



The plumbing systems inside a home, building, or facility that supply drinking water to its occupants are referred to as premise plumbing. Premise plumbing can contain a variety of materials including copper tubing, brass, steel or iron fixtures, and different solders, and many of these surfaces become coated with scale or precipitates over time. Both premise plumbing age and water quality can impact the precipitation and dissolution of premise plumbing scales. Seasonal and temporal water demand patterns can lead to differences in water age within these systems which in turn affects disinfectant residual loss and biofilm growth. Therefore, monitoring water quality throughout these distribution networks is imperative to ensuring the safety and reliability of water supply systems. For this seminar, we will present our follow-up study on water quality stability more than six years after piping installation in a large-scale premise plumbing system with changing cold drinking water use patterns. Using a variety of physicochemical metrics, we correlated water quality changes with heterotrophic bacteria abundance for different building occupancy patterns and contrasted this information with the baseline study performed in 2018 when the building initially opened.

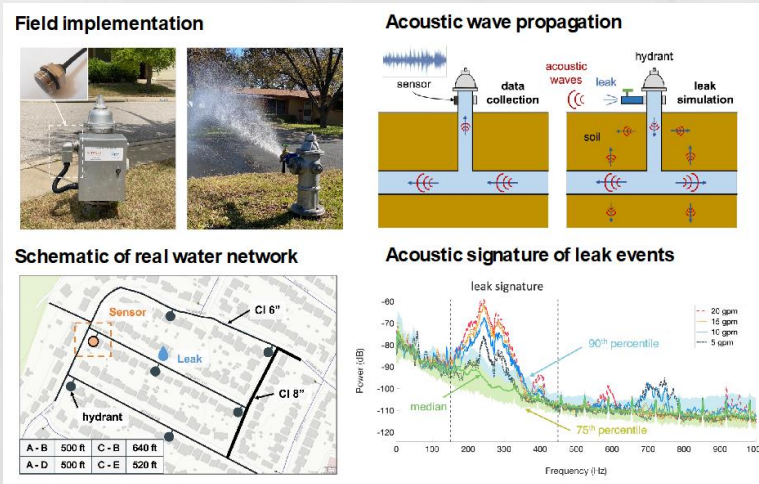
Acoustics-based Leak Detection in Urban Water Distribution Networks using Hydrophones

Konstantinos Sitaropoulos

Current PhD Candidate, the University of Texas at Austin, MS Civil Engineering (2020), the University of Texas at Austin

Advisors: Dr. Lina Sela and Dr. Salvatore Salamone

Cities worldwide have been plagued by water pipe leaks for many decades, resulting in financial losses, public health risks, and environmental impacts. Given that traditional localized leak inspections are time-consuming and costly, and thanks to recent advances in sensing and communication technology, passive pipeline leak monitoring systems provide an attractive alternative for water utilities. Although previous research shows that hydrophone sensors can effectively detect the leak-induced sound waves propagating within water pipes, limited work exists on the applicability and effectiveness of hydrophones in real water networks. Our study uses field-collected data from a real water network in Austin, TX to characterize the acoustic signature of leak events and identify the challenges of acoustics-based leak detection in real water networks. By visualizing and understating the field data, we were then able to propose two different approaches to improve leak detection performance in realistic scenarios.



EWRE Seminar Committee Members: Claire Baldus, Mila Otegui, Elle Henson, Priyanshu Gupta, and Zijie Zheng

Supervising Faculty: Dr. Ben Hodges