Environmental and Water Resources Engineering Seminar Series Presents:

Thursday, December 5th 2024, 3:30-4:30pm, ECJ 1.308

Health implications of nitrification & disinfection decay in drinking water systems during reduced occupancy

Eric Devlin
Current Master's Student in the EWRE Program
Advisor: Dr. Lynn Katz

Abstract: Periods of reduced building occupancy, such as during COVID-19 lockdowns, created unique challenges for maintaining water quality in building plumbing systems. Prolonged stagnation and decreased disinfectant levels fostered conditions for nitrification, a microbial process that increases nitrate and nitrite levels in drinking water. This presentation explores the health implications of elevated nitrate consumption, including risks like methemoglobinemia and emerging concerns such as cancer and cardiovascular effects. Drawing on insights from the EPA's Integrated Risk Information System (IRIS), we examine the evolving understanding of nitrate toxicity and its impact on regulatory standards. By addressing these risks and discussing potential mitigation strategies, this work highlights the importance of proactive water management to ensure safe drinking water in underused buildings.

Quantifying open channel flow using remote sensing techniques

Alexandra Stephens
Current Master's Student in the EWRE Program
Advisor: Dr. Blair Johnson

Abstract: Accurate measurement of river flow and sediment transport are essential for managing water resources and protecting infrastructure. Current methods of streamflow calculation used by organizations like the USGS can be costly and labor-intensive, and data collected during peak discharge events is limited. Alexandra's master's research verifies and builds upon innovative remote sensing techniques that leverage surface particle image velocimetry (SPIV) to measure volumetric discharge and bed shear stress in open-channel flows. By correlating surface velocities with flow depth and turbulence metrics, this method aims to provide an alternative for stream gauging and sediment transport prediction. This talk will cover the foundational principles of SPIV and prior work using this method in open-channel flow, the experimental setup, and adaptations for real-world field conditions. While results are pending, the proposed methodology aims to improve the accuracy and availability of stream gauging data, with far-reaching implications for safer, more accessible environmental flow monitoring.

EWRE Seminar Committee Members: Azalea Norwood, Elle Henson, Hiromu Koyama, Priyanshu Gupta, and Zijie Zheng
Supervising Faculty: Dr. Kerry Kinney