Environmental and Water Resources Engineering Seminar Series Presents:
Thursday, October 29th 2020, 3:30-4:30pm

Primary Concentration Method Development for the Detection and Monitoring of SARS-CoV-2 in Wastewater

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Monitoring of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA titers in wastewater has emerged as a promising strategy for understanding and predicting community-scale prevalence of COVID-19, the resulting disease. However, studies that have been conducted around the United States and the world lack a uniform procedure by which to concentrate wastewater to detectable and quantifiable concentrations of SARS-CoV-2 RNA. We will present data that suggests that SARS-CoV-2 preferentially partitions to the solid phase, as opposed to the liquid phase. Therefore, we assert that the suspended solids of wastewater samples should be the focus of future experimental designs.

Investigations of the Spatio-temporal Variations of PM$_{2.5}$ in an Urban Environment using a Network of Low-Cost Sensors

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While fine particle (PM$_{2.5}$) concentrations can vary in space and time, the spatial density of most monitoring networks is low, especially in many developing world cities. Lower-cost sensors could fill critical data gaps for PM$_{2.5}$. Pre-deployment evaluation of the PA sensors demonstrated high reproducibility, low unit-to-unit variability, and low bias among sensors. Sensors were distributed to the field in August 2019. 37 of the sensors in 36 sites reported data from August 23, 2019 through July 1, 2020. The median daily concentration of the 36 sensors ranged from 27 to 42 µg/m$^3$, suggestive of substantial spatial variability in PM$_{2.5}$ across Bangalore. Diurnal patterns were also compared between the 37 sensors. In these yearly averaged patterns, all sensors showed a general pattern with morning and afternoon peaks, though some sensors saw lagging peaks compared to the majority of sensors. Overall, we observed the highest average concentrations and larger diurnal variability for sensors sited near major roads and in the urban core, while diurnal patterns exhibited lower concentrations and less variability for sensors located on the urban periphery.