

## “AUTONOMOUS CONTROL OF STORMWATER QUALITY”

### MS. BROOKE MASON



PH.D. CANDIDATE  
CIVIL & ENVIRONMENTAL ENGINEERING  
UNIVERSITY OF MICHIGAN

#### ABSTRACT

Autonomous and connected stormwater systems will reduce flooding and pollutants, in just half the footprint of traditional water infrastructure. Adding sensors and control technologies to existing infrastructure will enable self-controlling water systems, which will optimally route, store, and treat stormwater in real-time. Before this vision can be realized, however, a number of fundamental knowledge gaps must be bridged. With a focus on managing runoff pollution -- one of our biggest environmental problems -- I will discuss research advances across the intersection of environmental engineering, sensing, data, and controls. A novel and large sensor testbed for controlled stormwater infrastructure has been deployed in southeast Michigan. The testbed includes a network of sites retrofitted with flow and water quality sensors and controllers. Beyond sensing, I will also introduce a dynamical systems framework for modeling and optimizing water quality in real-time. This work sets the foundation for autonomous stormwater systems that protect human health and our aquatic ecosystems.

#### BIOGRAPHY

**Brooke E. Mason** is a Ph.D. Candidate at the University of Michigan in the Department of Civil and Environmental Engineering, with a joint MS in Electrical Engineering & Computer Science. In the era of the self-driving car, her goal is to bring the same technologies to water and environmental conservation. She studies autonomous control of stormwater systems to reduce stormwater pollution, which is recognized as one of our greatest environmental and social challenges. Brooke is a founding member of Open-Storm.org, an open-source consortium dedicated to freely sharing hardware, software, and case studies on smart water systems. She is a recipient of the Beyster Computational Innovation Fellowship, Dow Sustainability Fellowship, and Rackham Merit Fellowship. Brooke serves as a peer mentor, a member of the Graduate Student Advisory Council, and a contributing member of the Diversity, Equity, and Inclusion Committee. Outside of UM, she serves on the executive board of ASCE's Women-Water Nexus Committee and as a mentor with Clean Water Science Network.

**ZOOM INFORMATION:** <https://vanderbilt.zoom.us/j/91708286738>

Meeting ID: 917 0828 6738