



School of
**CIVIL AND ENVIRONMENTAL
ENGINEERING AND EARTH SCIENCES**
Clemson University

DISTINGUISHED LECTURE



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Transport of Complex Substances in Complex Environments

Classically, transport of solutes and contaminants in streams and rivers is treated in the same manner as transport in a pipe with solid boundaries. However, streams and rivers are complex with fast flow in the open channel as well as exchange and slower flow through the surrounding substrate. Even for simple solutes this can lead to behaviors that cannot be captured by conventional means. On top of this streams and rivers are rich ecosystems with diverse microbial communities that can vary significantly in their impact depending on which part of the stream they live in. I will present a series of experiments and non-classical theory that allows for the inclusion of such complexities, which naturally accounts for the diversity and heterogeneity present in real settings. Finally I will explore what the influence of this is on complex substances that are being transported, specifically substances that particulate and polydisperse in nature. I will use environmental DNA (eDNA) and antimicrobial resistance genes as examples of this and highlight what differences occur when the full range of complexity is accounted for relative to a purely classical approach.

*Friday, February 14, 2025 @ 1:25 PM | Watt Center Auditorium
Reception follows in the atrium*