



## EEE Research Seminar

Tuesday, October 1, 2019 at 10:30 A.M.  
POTTER HALL, Room 234 (Fu Room)

Dr. Sara McMillan, Associate Professor  
Environmental & Natural Resources Engineering  
Department of Agricultural & Biological Engineering



### Incorporating alternative values to design conservation and development programs

#### Abstract

Efforts are underway globally to improve water quality and other ecosystem services in watersheds impacted by urbanization. Excess nutrients (i.e., nitrogen and phosphorus) create eutrophic conditions that threaten water supply for human consumption as well as ecological health. It has long been recognized that the interfaces between terrestrial and aquatic ecosystems are locations where nutrient processing and removal is maximized. However, in urban landscapes these dynamic connections are often severed resulting in a shunting of water and materials to urban stream networks. A range of urban stormwater practices are used to reestablish these connections, including restoration of floodplain wetlands and creation of stormwater wetlands throughout the watershed. The assumption is that the structural changes to the watershed that mimic natural systems will allow the development of functional equivalencies as well. I will present results of several stream and wetland projects in Charlotte, NC where we are working to disentangle the effects of land use modifications, climate change, and restoration. Our work suggests that there are important feedbacks between restoration design and placement within the watershed and fill an important gap in identifying the potential for cascading positive effects on nutrient biogeochemistry when stormwater management practices are combined in urban landscapes.

#### Biosketch

Sara McMillan is an Associate Professor in Agricultural and Biological Engineering at Purdue University. She received her Ph.D. in Environmental Science and Engineering from the University of North Carolina at Chapel Hill and BS in Civil & Environmental Engineering from the University of Iowa. Prior to coming to Purdue, she spent 5 years as an assistant professor at the University of North Carolina at Charlotte and several years working as a professional engineer on the impacts of changing land use and climate on water quality. Her research focuses on linking geomorphic structure with ecological function in restoration projects. She integrates field-based experiments with modeling to mitigate the hydrologic and water quality impacts of human development. As an interdisciplinary researcher, she frequently collaborates with social scientists and ecologists to identify the social and biophysical factors that control access to clean water and healthy ecosystems. Her current research focuses on restoration to improve water quality and ecosystem services including projects on green infrastructure, agricultural BMPs, and stream/floodplain restoration.