

# Graduate Defense Seminar

## Ant and Spider Dynamics in Complex Riverine Landscapes of the Scioto River Basin, OH: Implications for Riparian Ecosystem Structure and Function

**Paradzayi Tagwireyi**, PhD Candidate, Ecosystem Science

Rivers and their associated riparian and floodplain zones are increasingly viewed as landscapes in their own right. Riverine landscapes are recognized as both internally heterogeneous (i.e., patchy) and linked with their surrounding landscapes. However, despite the importance of river corridors (e.g., as biological refuges in human-modified landscapes), the role of riverine landscape patchiness on ecosystem structure and function is largely unknown. At 12 reaches of the Scioto River, OH, representing an urban-rural gradient, I investigated the environmental drivers of site-specific riverine landscape patterns. I then used riparian spiders of the family Tetragnathidae and ants as model organisms to explore the associations between riverine landscape patchiness and the distribution, diversity, and trophic

dynamics (e.g., trophic position) of riparian biotic communities, with particular consideration given to their reliance on aquatically-derived food resources. I found that a mixture of external and internal factors were associated with riverine landscape pattern (patch area, shape, and size) including drainage area (a proxy for ecosystem size), proximity to impoundment (a proxy for lateral flow connectivity), and catchment

land use and land cover (e.g., % urban, % agriculture). Patchiness (e.g., patch area, edge, and shape) was related to ant diversity and density, but gradients in elevation and distance from surface water represented the strongest environmental determinants of ant distribution. Patch composition and trophic dynamics of ants were also strongly associated. I observed that both terrestrial (habitat) and aquatic (emergent insect food resources) were strong predictors of riparian tetragnathid distribution, trophic dynamics, and the capacity of spiders to ecologically link aquatic and terrestrial ecosystems. By providing evidence that spatial habitat patterns within riverine landscapes can influence the structure and function of riparian ecosystems, this study lends insight into the utility of landscape ecology to river science and management.



MONDAY

APRIL 28, 2014

9:00 A.M.

460 KOTTMAN HALL

[senr.osu.edu](http://senr.osu.edu)

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: [go.osu.edu/cfaesdiversity](http://go.osu.edu/cfaesdiversity).



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES