## BIOMATH SEMINAR Friday, February 27 1-2 pm Harris 4119

## Modeling rodent dynamics in an urban landscape



## Dr. Rosalyn Rael Tulane University

Abstract: Following a traumatic event such as a natural disaster, ecological and societal communities concurrently change and reassemble in response to one another. This recovery process can provide opportunities for human commensal pest species to recover and spread as well. Norway rats are common urban pests that can carry and transmit several zoonotic pathogens, posing a potential health risk to humans and domestic animals. Though they are globally widespread, little is known about how natural and human-related changes in urban landscapes affect the population dynamics and movement of this species. As part of an interdisciplinary project investigating recovery of human and natural systems in New Orleans after Hurricane Katrina, we are designing a framework for modeling movement and dynamics of Norway rat populations. I will present this spatial network-flow model of movement across a landscape and describe some general preliminary results relating network structure with likelihood of area occupancy. I will also describe how we will use extensive data being gathered on rat demographics and genetics through a trap-based census study, ground cover vegetation data, and GIS data to parameterize movement and life history parameters in the model. I will also describe applications of this model for predicting gene flow, invasions, and developing strategies for controlling the spread of rats and rodent-borne diseases.