



# NIMBioS

National Institute for Mathematical  
and Biological Synthesis

## **“Using the mathematical programming language R for statistical modeling with counts of bats”**

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**National Institute for Mathematical and Biological Synthesis**

**Tuesday, October 12, 2010**

**3:30 pm\*, Room 403, Blount Hall, 1534 White Ave.**

*Statistical modeling of relative animal abundance or habitat use presents several challenges, including the ease or difficulty of detecting the animals, the potential interference of animal activities, and the variance of activity measured by counts when compared to typical statistical modeling assumptions. Bat counts are a great example of these complications, as bats are overdispersed and serially correlated. Bat counts are growing increasingly important with the emergence of diseases (such as white nose syndrome), the changing climate, and other anthropogenic threats. However, many methods for modeling bat counts are of limited defensibility. We compared the differences in bat counts between two habitats in a variety of scenarios. We looked at conditions where bats were easily detected during mating and hibernation, investigated the effects of variable activity levels on hierarchical model performance with simulated bat data, and produced models that account for seasonal differences in bat activity. Investigating these scenarios required a variety of modeling techniques and encompasses a survey of many current count modeling techniques in R.*

*\*Join us for refreshments in the NIMBioS Lobby on the 4<sup>th</sup> floor at 3 pm.*