NIMBioS
National Institute for Mathematical and Biological Synthesis

NIMBioS Interdisciplinary Seminar

Dr. A. Michelle Lawing
NIMBioS Postdoctoral Fellow

3:30 p.m.*, Tuesday, March 5, 2013

Hallam Auditorium, Room 206
Claxton Education Building, 1122 Volunteer Blvd.

"Species geographic response to past climate change and the evolution of multivariate systems"

Geographically explicit models integrating data and methods from geology, ecology, evolution, and climate science provide a deeper understanding of the biology of climate change. I integrate rich geological and paleoclimatic data with an evolutionary concept of the climatic niche. Projecting phylogenetically informed species distribution models over the last three glacial-interglacial cycles (320 thousand years ago) indicates that species within the rattlesnake genus *Crotalus* tracked their habitat as opposed to adapting to climate change. The rate of geographic displacement of suitable habitat over the next century will be two to three orders of magnitude faster than it was over the last 320 thousand years. A deeper time perspective of spiny lizard (*Sceloporus*) response to climate change, early Miocene (20 million years ago) to present, shows that neutral models of climatic niche evolution are not validated with fossil occurrences. Better models and parameters to describe phylogenetic changes in climatic niches, and other multivariate systems, need to be explored. I propose a method that explicitly deals with the issues of non-independence of traits and variant covariance matrix structures by treating the covarying traits as a mathematical system that rotates, translates and scales through trait space.

***Join us for refreshments at 3 p.m. in the 1st floor visitor breakroom.*

For more information about this and other NIMBioS Seminars, visit http://www.nimbios.org/seminars

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