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NIMBioS Investigative Workshop

Species' Range Shifts in a Warming World

Topic: Methods for integrating niche models, genetics, and fossil pollen data to understand species' range dynamics under changing climates

Meeting dates: May 3-5, 2017

Location: NIMBioS at the University of Tennessee, Knoxville

Organizers:

[Sean Hoban](#), The Morton Arboretum, Lisle, IL

[Allan Strand](#), Biology, College of Charleston, SC

[Andria Dawson](#), Statistics, Univ. of California, Berkeley; Geosciences, Univ. of Arizona, Tucson

[Michelle Lawing](#), Ecosystem Science and Management, Texas A&M Univ., College Station

Objectives: Climate change is dramatically altering species' ranges and community composition, which will impact forest productivity, carbon cycling, and global biodiversity. Understanding how species and communities responded to past climatic changes, especially to dramatic warming following Ice Ages, can help us predict and mitigate future outcomes. However, our current understanding of historic ranges and species' dynamics, based on single data types and outdated methods, is deficient (and sometimes misleading). Moreover, we lack a framework for explicit hypothesis testing of post-Ice Age biogeographical inference. This workshop aims to improve our ability to understand species' and community response to climate change by identifying new modeling and analytical tools for integrating currently isolated datasets and fields of research on large-scale ecosystem shifts. Specifically, this workshop will focus on integrating paleoclimatic niche modeling, fossil pollen data, simulations of forest stand processes, and genetic marker data. These approaches vary in spatial and temporal resolution. At this workshop, researchers from diverse fields will: explicate the advantages and assumptions of each data type; discuss ways to analyze disparate data in a statistically coherent manner, while quantifying uncertainty across scales; and define a framework to examine species jointly at the community level rather than individually, leveraging power from many datasets. Synthesis findings from the workshop will be published, and a funding application will be organized to test this framework. Accomplishing these goals requires combining mathematical and computational approaches from very different fields – an exciting prospect. This workshop will help link and utilize large but underused datasets developed over decades, and lay foundations for genuinely interdisciplinary, collaborative paleoecological science.

[Descriptive flyer](#)



[Species' range shifts in a warming world WordPress site.](#) NIMBioS has created a WordPress site to facilitate group communication and information sharing for the workshop. This is an interactive tool for sharing resources and comments **before, during and after** the meeting. All participants will receive an official email from WordPress inviting you to join the site. You will be asked to click on the link in the email from WordPress to accept the invitation. Before the meeting, we encourage you to introduce yourself to the rest of the group by writing a post with some details about your background and what you hope to gain from the meeting. Full details on how to post, comment and upload files to the WordPress site are available at the site (<http://www.nimbios.org/wordpress-training/rangeshifts/>).

Summary Report. TBA



[NIMBioS Investigative Workshops](#) focus on broad topics or a set of related topics, summarizing/synthesizing the state of the art and identifying future directions. Workshops have up to 35 participants. Organizers and key invited researchers make up half the participants; the remaining participants are filled through open application from the scientific community. Open applicants selected to attend are notified by NIMBioS within two weeks of the application deadline. Investigative Workshops have the potential for leading to one or more future [Working Groups](#). Individuals with a strong interest in the topic, including post-docs and graduate students, are encouraged to apply. If needed, NIMBioS can provide support (travel, meals, lodging) for Workshop attendees, whether from a non-profit or for-profit organization.

A goal of NIMBioS is to enhance the cadre of researchers capable of interdisciplinary efforts across mathematics and biology. As part of this goal, NIMBioS is committed to promoting diversity in all its activities. Diversity is considered in all its aspects, social and scientific, including gender, ethnicity, scientific field, career stage, geography and type of home institution. Questions regarding diversity issues should be directed to Dr. Ernest Brothers, the NIMBioS Associate Director for Diversity Enhancement (diversity@nimbios.org). You can read more about our [Diversity Plan](#) on our [NIMBioS Policies](#) web page. The NIMBioS building is fully [handicapped accessible](#).

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