



NIMBioS

National Institute for Mathematical
and Biological Synthesis



NIMBioS Interdisciplinary Seminar 3:30 p.m.*, Tuesday, October 7, 2014

Dr. Peter Smouse
Ecology, Rutgers University
NIMBioS Postdoctoral Fellows Invited Distinguished Visitor

“Correlated Biotic and Abiotic Patterns in *Embothrium coccineum*: Can *Embothrium* Survive Patagonian Climate Change?”

Adaptive radiation and reproductive isolation can determine the biogeographic structure of any species. *Embothrium coccineum* (Proteaceae) is a South American tree species that dates to the Oligocene, and now spans 20° of latitude and 1500m of elevation on both slopes of the Andes. It is both morphologically and genetically highly variable, as is typical of species spanning such vast geographical regions in both hemispheres. We have deployed hyper-dimensional PCA and CCA methods to explore the correspondence between biotic pattern and current geographic and climatic gradients for 34 populations (934 individuals). Smaller, rounder leaves and particular alleles typify the colder-drier parts of the range, while larger, lanceolate leaves and alternative alleles typify warmer-moister areas. The climate of South America is changing, so we “forward mapped” those patterns onto a future climatic landscape, based on a projected doubling of CO₂ for South America. Our analytic approach can be extended to analysis of biotic/abiotic co-patterns in other species facing climatic challenge. Species with sufficient geographic and adaptive substrate, and with sufficient dispersal potential, should be able to “keep up” with the pace of spatial climatic shift. The tolerable climatic regime *Embothrium* will clearly shift a bit geographically, but this lineage has survived repeated and dramatic climatic shifts since the Oligocene, and it should also be able to move and adapt quickly enough to meet the present challenge. On balance, it seems clear that *Embothrium* is here to stay.

**Location: Tom Hallam Auditorium, Room 206 at NIMBioS, Claxton Education Bldg,
1122 Volunteer Blvd.**

**Join us for refreshments at 3 p.m. in Room 205.*

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

The National Institute for Mathematical and Biological Synthesis (NIMBioS) brings together researchers from around the world to collaborate across disciplinary boundaries to investigate solutions to basic and applied problems in the life sciences. NIMBioS is sponsored by the National Science Foundation, with additional support from The University of Tennessee, Knoxville.

