

# Purdue University

The Department of

# Botany & Plant Pathology



## SEMINAR NOTICE

*Geology, climate, and tree species distributions  
in tropical forests of Panama*

**Dr. Richard Condit**

Smithsonian Tropical Research Institute  
And Chicago Field Museum

**Wednesday, November 29, 2017  
3:30pm WSLR Room 116**



### Abstract:

Diverse forests of the Panamanian Isthmus vary greatly in species composition. Much of the variation results from rainfall patterns, and tree species found in the wet lowlands of the Caribbean coast are much different from those of the dry Pacific slope. Early on, though, Robin Foster related his experiences to me, and I began rigorous tests of how geology interacted with climate to shape forest composition. Two important observations arose. First, deciduous species of the dry Pacific reappear on limestone outcrops near the Caribbean coast, and conversely, species of wet Caribbean forests appear on ancient basalts of the Pacific slope. Trees were thus suggesting that soil composition could influence how much water was available to plant roots, but my understanding of lithology and moisture did not go further. When Ben Turner joined the research group, we finally learned detailed soil chemistry across the geological formations, and our understanding changed direction. It turned out that soil phosphorus is highly variable, with limestone formations having 200-times the [P] as ancient basalts, and many tree species are sensitive to phosphorus. We found that deciduous species require high phosphorus, which made sense to me, but surprisingly we also found a diverse suite of species that avoid high phosphorus. Moreover, we now know that soil bacteria activate phosphatases when available [P] falls below 2 ppm, and at a similar concentration, tree species composition shifts. Nevertheless, despite the P limitation on species composition, forests grow and produce biomass equally well across the entire region. Forest communities are well adapted to low phosphorus as well as the long dry season because of the diversity of species responses.

-To schedule a meeting with the speaker contact Stacie Kitchen at [kitchen0@purdue.edu](mailto:kitchen0@purdue.edu)-