



Department of Zoology

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Applicant: Sean Moore
Mentor: Dr. Elizabeth Borer

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Dear Selection Committee,

I am writing in strong support of Sean Moore as a participant in the Advanced Studies Institute on Mathematical Modeling of Infectious Diseases. Sean is my doctoral student, and I have known him since he started in my lab in September 2005. He arrived at Oregon State University after completing two Bachelor degrees, the first in Business Administration and Mathematics at the College of William and Mary, and the second in Biology at Virginia Polytechnic Institute. He excelled in both degree programs (with cumulative GPAs of 3.6 and 4.0, respectively) and was admitted as one of the top applicants to the OSU Zoology graduate program. Sean has formal training in calculus, linear algebra, differential equations, and several graduate level statistics as well as population and community ecology. Sean arrived in my lab with both the technical skills required to jump into developing and programming calculus-based models and the ecological knowledge necessary to ask interesting and insightful questions.

After only a year and a half in my lab, Sean has already developed and analyzed a model exploring the implications of predation on a vector for controlling pathogen dynamics. This model has relevance for many vectored agricultural pathogens and may provide insights into situations in which biological control of vectors could be successful. He is a deep and quiet thinker who produces very strong work. I believe that he has the potential to be one of the future research leaders in disease ecology.

In addition to his predator-vector-SI model, Sean is planning to develop a model examining the implications of space on vectored pathogen dynamics and combine this with targeted field experiments on a vectored multi-host pathogen of grasses (including most major crops), barley yellow dwarf virus. His theoretical work will shed light on processes controlling vectored pathogens in natural communities. The importance of establishing an ecological understanding of disease transmission is gaining increasing recognition as a critical need for society and an important test for the science of ecology. In spite of decades of valuable work in community ecology that could be brought to bear on this issue, the current theoretical and empirical disease ecology literature is strongly focused on host-pathogen or host-vector-pathogen interactions. Sean's dissertation work will produce theory necessary for a predictive framework to understand the role of spatial processes and predation on disease dynamics and will allow assessment of the importance of these factors for controlling vectored-pathogen spread.

While our program at OSU can provide Sean with the background in ecology, and my lab is examining vectored diseases in grass communities, your epidemiological modeling course will provide him with training in mathematical modeling not available at OSU. I have a background in calculus-based ecological models, and will gladly mentor Sean's continuing research related to your program.

Sean is an engaged and curious scientist who seeks out important research questions. He also actively pursues the training to achieve his goals, and his stellar academic record speaks for itself.

Sincerely,

Elizabeth Borer
Assistant Professor, OSU Zoology