University of Miami
Institute for Theoretical and Mathematical Ecology
in cooperation with the
Department of Mathematics
College of Arts and Sciences

Colloquium

Professor David Smith

University of Florida
Gainesville, FL
&
Center for Disease Dynamics Economics and Policy
Washington, DC

will present

"Recasting the Theory of Transmission by Mosquitoes"

Thursday, February 24, 2011
5:00- 6:00 pm, Ungar Bldg. rm 402

Refreshments served at 4:30 p.m. in CC 521

Abstract

Mathematical modeling for mosquito-borne diseases has been used to develop theory and guide disease control for more than a century, but the demands on models have been changing. Analysis of a comprehensive review of mosquito-borne transmission models demonstrated that mosquito-borne disease models follow the conventions of the Ross-Macdonald model and that there has been little innovation in modeling transmission. A new mathematical description of transmission was based on mosquito movement, aquatic ecology and blood feeding behavior. Mosquito movement can be described concisely as a random walk on a bipartite graph. Transmission also depends on the ways that mosquitos allocate bites on humans and the way humans allocate their time at risk. This framework provides a starting point for reformulating a new theory of transmission that captures other aspects of mosquito behavior that are important for transmission but absent from the Ross-Macdonald model.