Maud Menten Institute / Mathematical and Statistical Biology Seminar

Monday, February 23, 2026
12 pm PST (in person)
Human & Social Dev A-270

Join Zoom Meeting
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Register in advance for this meeting:
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After registering, you will receive a confirmation email containing information about joining the meeting.

Attend the Watch Party:
At UAlberta @ 1:00 (MT) - room UComm 2-108
At UManitoba @2:00 (CT) – Education Building 338

Alan Hastings

Department of Environmental Science and Policy
University of California Davis

An Inverse Approach for Understanding Ecological Coexistence

The question of how species coexist is one of the most fundamental questions in ecology. The standard approach for using models to understand what leads to ecological coexistence can be caricatured as start with a model, specify parameters, and look at the outcome. This can also be extended to looking at ranges of parameters. If simulation approaches are used, an issue is the extent to which the results are sensitive to parameter choice. Much recent work has used model fitting approaches to match a model to a particular outcome. The model fitting approach has the feature that it explains a particular case, but this approach does not lead to general understanding. I will present a different strategy based on an inverse approach of specifying a set of outcomes, and then determining the range of parameters explaining potential observed behavior. I will then apply these ideas to three specific cases; 1) the maintenance of large diverse food webs, 2) higher order interactions as an explanation for coexistence, 3) competition-coexistence tradeoffs as a mechanism leading to coexistence. I will present possible further extensions.