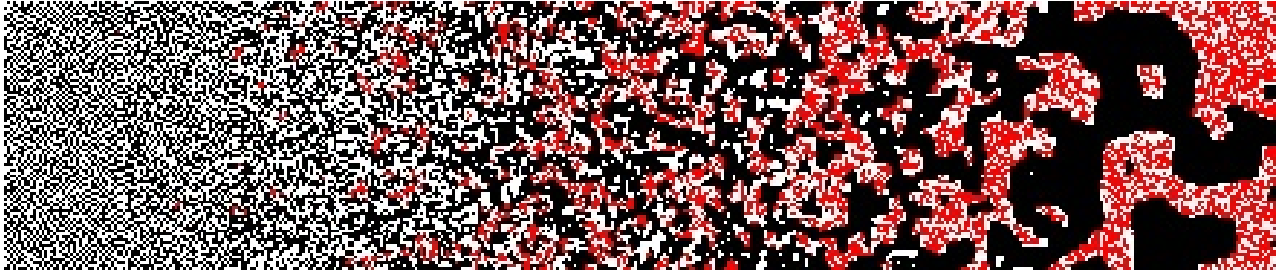


MAT 486, Biological Modeling & Simulation

Instructor: David Hiebeler (david.hiebeler@maine.edu)

Spring 2026



Locally-dispersing population in a gradient landscape with heterogeneous habitat

Course description: This course explores some models in population biology and epidemiology. Models will be explored both mathematically and computationally, using the R software platform as a programming language. Topics include:

- Discrete-time models (difference equations)
 - Single-species models
 - Systems (age/stage-structured populations, or multiple species)
 - Stochastic models: variation in space, and variation in time
- Continuous-time models (differential equations)
 - Single-species models
 - Systems (multiple species or states)
 - Stochastic models: Poisson processes
- Spatial models: simulating spatial population/epidemiological models, and mathematical approximations of them; possibly some network models

Prerequisites:

- A grade of C or better in MAT 126, and in STS 132, STS 235, STS 332, or STS 434, or department permission.
- Having seen some differential equations (MAT 259), linear algebra (MAT 262), and/or having some programming experience in any programming language would also be helpful, but is not strictly necessary.

Textbook: TBD