

AMATH 536

SPATIAL MODELS IN ECOLOGY AND EPIDEMIOLOGY

The Department of Applied Mathematics is offering a new spring course in mathematical biology that considers the growth and dispersal of biological populations. Major topics will include:

A. Formulating spatial models:

1. Random walks
2. Reaction-diffusion equations
3. Integrodifference equations

B. Core problems:

1. Population persistence. What is the critical patch size for an endangered population ?
2. Range shifts. Can populations keep pace with climate-induced range shifts ?
3. Spread rates. How quickly do invading populations spread ?
4. Pattern formation. Can spatial patterns in density arise from trophic interactions and dispersal in homogeneous environments ?
5. Age and stage structure. How do age and stage structure, in growth and dispersal, affect the answers to the above questions ?

Spring 2012. 5 credits.

M, W, F 10:30–11:20, MGH 251

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