
FRITHJOF LUTSCHER, University of Ottawa

Population dynamics in fragmented landscapes: models, results, and future challenges

Reaction-diffusion equations have been the workhorse for modelling and analyzing population dynamics in space and time for many decades. The most famous result is the calculation of an invasion speed that goes back to Fisher and Kolmogorov, Petrovsky and Piskunov in the 1930s. As ecologists increasingly acknowledged the importance of different habitat types and landscape fragmentation for species persistence and spread, modellers began to include such elements into reaction-diffusion equations, and to analyze the resulting properties. These efforts have led to a wealth of models and mathematical results since the hallmark paper by Shigesada, Kawasaki and Teramoto in 1986. In this talk, I will review some of the ecological questions, the mathematical models, and their results from the past two decades. I will point out similarities and differences and some challenges that future models and analysis should address.