Nonlinear population dynamics in heterogeneous habitats

E. H. Colombo & C. Anteneodo,
Department of Physics, PUC-Rio

We consider a paradigmatic nonlinear model, which generalizes Fisher equation, for the temporal evolution of the population distribution of a single species that develops within a finite habitat. Population dynamics might produce a positive or a negative feedback on the rates of the elementary processes, such as reproduction, competition and dispersal, driving the population towards survival or extinction. A relevant question is the critical habitat size L_c for which the population can survive. Our results show how L_c depends on the nonlinearities in the diffusion and reproduction rates.