A PROBABILISTIC APPROACH TO THE ESTIMATION OF THE MAGNITUDE OF STOCHASTIC FACTORS AND THE STRENGTH OF SPECIES INTERACTIONS IN COMMUNITY DYNAMICS

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Population and community dynamics have recently received a great deal of interest in line with the concerns raised by the loss of biodiversity.
The ability to predict future population sizes and consequently estimate the probability of extinction for endangered species or the optimal yield for harvested populations depends crucially on the accommodation of both, deterministic and stochastic underlying forces. We build a probabilistic model of community dynamics which can be fitted to the data using Markov Chain Monte Carlo methods to estimate the magnitude of stochastic factors (demographic and environmental variances) and the strength of species interactions in community dynamics.
The model provides a flexible framework in which many ecological hypotheses such as species heterogeneity can be tested; the parameter estimates can also be utilized in analyzing long term viability of communities.