

# Temporal changes in parameters of biological community models

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**Abstract:** In order to conserve biological diversity and at the same time allow anthropogenic development, a thorough understanding of how the latter affect the former is a key point. Stochastic community models that jointly consider a large number of species has received increased attention during the past 30 years. Analysis of extinction processes have been developed for so-called homogeneous and neutral community models assuming a stationary environment. Due to anthropogenic effects, we will assume that parameters describing community dynamics can vary in time. Previously, we have studied this concept in models of single species that revealed a time delay in the dynamics of species as a response to the change in a parameter. We now extend this analysis to model changes in communities over time, such as a decrease in available area. We will study such processes for homogeneous as well as heterogeneous models, expressed by the distribution of dynamic parameters across species. We will use simulations and numerical analysis to study change in diversity, extinction processes and community responses to both gradual and abrupt changes in parameters and from a conservation point of view discuss community sustainability in such cases.