Stochastic dynamics of spatially extended population with Allee effect

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Low population density in some species implies a reduced or negative growth rate. This behavior is known as Allee effect and can lead to local or even global extinctions.

Here, we study the population evolution in the presence of migration, harvesting and environmental stochasticity. We consider a logistic spatially extended model with Allee effect at low densities and density regulation at high densities. Thus, we consider that the growth rate decreases both due to undercrowding and to overcrowding. We characterize the conditions for local and global extinctions induced by stochastic environmental fluctuations.

Our results give insight in the effects of migration and harvesting in species conservation subject to the Allee effect.

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