

Introduction to Theoretical Ecology Assignment 8

Stabilizing Lotka-Volterra Predator-Prey Model

In the lab section, we have seen that the basic Lotka-Volterra predator-prey model produces neutral cycles of populations:

$$\frac{dN}{dt} = rN - aNP$$

$$\frac{dP}{dt} = eaNP - \delta P$$

The equations can be modified so that the model can generate stable coexistence of predator and prey.

1. Modify and write down the equations that produce stable coexistence. You can add/change any terms in the original model. (5 pts)
2. Select a set of parameters of your choice and visualize the population trajectories demonstrating stable coexistence. (5 pts)