

Probabilistic Models in Population Dynamics

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In this talk, we will discuss several models in population dynamics. These models incorporate features including birth, natural death, migration, immigration, and competition. For example, a birth rate of $\beta > 0$ indicates that an individual gives birth to an offspring after a random time that has an exponential probability distribution with expected value $1/\beta$. We consider the cases when such population rates are constant as well as when the rates are random themselves. For instance, birth and death rates of many species are affected by climate conditions (temperature, humidity, etc.) and may change with changing conditions. We investigate the question of if and/or when one might expect the population to reach an equilibrium.