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Mathematical models for the neutral genetics of changing populations

In this talk I will discuss the genetic structure of populations subject to climate change and undergoing range expansion. The models and analyses are based on reaction diffusion and integrodifference equations for the asymptotic neutral genetic structure of populations. We decompose solutions into neutral genetic components called neutral fractions. The "inside dynamics" then describe the spatiotemporal evolution of these fractions and can be used to predict changes in genetic diversity. Extensions are made to include stage-structure in the population dynamics and mutations in the genetic fractions. Results are compared with small-scale experimental systems that have been developed to test the mathematical theory. This work is joint with Nathan Marculis, Roger Lui and Jimmy Garnier