

Climate change on the population of checkerspot butterflies

[Literature](#), [Russian Literature](#)



The paper "Climate Change on the Population of Checkerspot Butterflies" is an outstanding example of an essay on environmental studies. The purpose of the study was to research the effect of climate change on the population of two species of checkerspot butterflies. The questions asked in the study were whether long-term trends in climatic means could reduce overlap by hastening plant senescence or by shifting plant and larval phenologies relative to each other and whether climatic variability could increase variability in overlap, inducing greater population fluctuations and eventual extinction. The hypothesis was that the changes in climate will affect the population of two species of *Euphydryas editha bayensis*. Model selection was conducted by using ordinary cross-validation to minimize error. Models were fitted to abundance data for adult males. Precipitation data from San Jose and Woodside were corrected for errors by using linear regression. Simulations were run with each of 1,000 bootstrapped samples drawn from two different periods in which each population went extinct. Some of the variables involved in the research were precipitation (W), adult abundance (N) and year (t). The similar simulation was obtained by using bootstrapped precipitation data from other relevant time intervals. The control involved in the study was the starting population sizes in two periods. The results demonstrate that increased precipitation variability likely caused extinctions of two butterfly populations. It is likely that extremes in annual precipitation reduced the temporal overlap of larvae and plants, which increased larval mortality and the magnitude of population fluctuations. Increasing frequency and severity of weather probably drove both populations extinct within three decades. The hypothesis is proved as the available information contradicts

alternative hypothesis for the extinctions at Jasper Ridge, including plant declines, natural predators, and research impacts. The unanswered part of the hypothesis is the effect of temperature on the butterfly population.