EXECUTIVE SUMMARY

This paper discusses the implementation of Bayesian data analysis to investigate the time between significant earthquakes in California. By constructing a Bayesian model, we plan to answer questions such as what is the average wait time between large earthquakes in California and what is the probability that California experiences a significant earthquake in the next year? To answer these questions, data was obtained from the Northern California Earthquake Data Center (NCEDC) on earthquakes from the past one hundred years (1921-2021). The wait times between significant mainshock earthquakes (earthquakes with a 6.0 magnitude or greater) were collected and analyzed. The results indicated that, on average, significant earthquakes occur approximately every 1.5 years. It was also found that there is a 47% chance of a significant earthquake occurring within one year of a previous significant earthquake. This paper provides recommendations for California residents and provides scientists with a model that can be extended to other natural disasters.