

## Actuarial Modeling of Natural Catastrophes

This research project explores the scale quantification of natural catastrophes like tropical cyclones, tornadoes, windstorms, volcanic eruptions, earthquake, tsunamis and river floods using mathematical formula. It also studies the various probability distribution models used to characterize economic loss, such as the lognormal, gamma, beta, Pareto, negative binomial, Cauchy and Weibull distributions. It looks at the temporal models of natural hazards, including the periodic process, Poisson process and Markov process, as well as long term data records in an analysis of annual river discharges with a focus on the interdependence of geophysical data over an extended period of time. Additionally, this project studies how mathematical models can be applied in estimating damages, forecasting, designing warning systems and their limitations in real world situations.