

Title:

Analysis of water quality data using generalized linear model with multivariate non-normal random effects.

Abstract:

Water deposition of pollutants can be a good indicator of both air and water quality in an interested region. Most of environmental data are collected at observation spots or stations, whose locations often contribute correlations to among data for pollutant deposition. In addition, it has been suggested that measurement of pollutant deposition depends on the time of the year, that is, there is temporal trends in the measurement of pollutant depositions. To deal with the spatial and temporal dependence among data for deposition of pollutants, we developed a generalized linear model with multivariate non-normal random effects. we employ proposed random effect model to analyze data of sulfate in a study of the deposition from air pollution to the Turkey Lakes Watershed in Sault Ste. Marie of Ontario in Canada. Comparing to the analysis by using Gamma regression under independence assumption, we observed that this model demonstrates that the random effect model which considers the dependence would yield a result more realistic.