

Project proposal

STAT 656

14 October 2023

Team members: Kyle Conrad and Sarah Baker

Type of project: Applied

Description of project:

We plan to investigate how plant growth within urban ecosystems responds to nitrogen fertilization and atmospheric decomposition within the Sonoran Desert using a Bayesian hierarchical modeling approach. Our data set (link included below) comes from DataONE, an online repository for open source data sets that have been collected for research purposes. The data we selected were collected in 2006 as part of a project investigating the impact of nitrogen and phosphorus fertilization within urban, desert ecosystems. We plan to use Bayesian hierarchical modeling, because it will allow us to investigate how plant growth among urban ecosystems of the Sonoran Desert varies with different levels of nitrogen and phosphorus fertilization via atmospheric deposition because it will allow us to incorporate multiple levels (in this experiment, the different urban ecosystems) with different treatment conditions (different compositions of fertilization).

Dataset:

<https://search.dataone.org/view/https%3A%2F%2Fpasta.lternet.edu%2Fpackage%2Fmetadata%2Feml%2Fknb-lter-cap%2F632%2F14>

Individual responsibilities:

We plan to evenly divide the responsibilities for the project and paper presentation. So far, we have both contributed to discussion and research surrounding our project and research paper topics of interest. We will evenly split the sections of the paper we present. For our project, we will work together to run the data analysis, and to present the results of the analysis to the class.

Paper for presentation:

Estimation of rainfall erosivity factor in Italy and Switzerland using Bayesian optimization based machine learning models; by Lee et al. (2022)

<https://www.sciencedirect.com/science/article/pii/S0341816221008158>