**Microclimate Similarity Characterization Research**

*Understanding dynamics of a microclimate across a season is important for a variety of factors, including monitoring infectious diseases spread, agricultural concerns, and wildfires. Microclimates involve a vast array of variables sequenced across time, which makes them good candidates for artificial intelligence analysis. Many artificial intelligence models analyze microclimates with regard to specific outcomes based on past data. However, there is a lack of general comparison mechanisms of one microclimate to another both in space and in time. We believe there is value in comparing seasonal microclimates from one area to another area or period of time in both analyzing outcomes and formulating management decisions for a problem at hand. The goal of this project is (1) to research, identify, and experiment with possible multivariate distribution comparison methods to develop a framework in quantifying environmental similarity, and (2) to use these metrics alongside new and traditional machine learning models to create useful forecasting tools for specific microclimate outcomes. Specifically, this project aims to look at invasive malaria mosquito outbreaks and agricultural yield as domain applications for microclimate similarity comparison.*