

Drought Prediction Problem Identification

- **Problem Statement Formation:**

Using weather and soil data, how do we predict droughts in the United States? Can a model be developed that has an accuracy greater than 80% within the next two months? Can these results be generalized to other countries with less available data resources?

- **Context**

With increasing climate change and an overall increase in global temperature, the occurrences of drought are expected to become more prevalent and occur in areas that historically over the last several hundred years have been less likely to experience drought. The United States has an abundance of weather and soil data compared to other countries. Can a model exceeding 80% accuracy be built? Can this model provide insight into predicting drought in other countries?

- **Criteria for Success:**

The prediction model will be a classification model with five categories for drought conditions. The model will predict the severity of the drought with an accuracy of greater than 80%. The project will be completed within the next two months with available data. Key variables will be identified for consideration in other countries to determine universality of the model.

- **Scope of Solution Space:**

The analysis will be constrained to a time series of 18 meteorological variables and 29 soil variables combined with information on latitude and longitude for 3100 sites from 2000 - 2020.

- **Constraints:**

The data does not have an even distribution of variables that correspond with each drought category. Accuracy will be assessed for each drought category to compensate for the uneven distribution.

- **Stakeholders:**

Policymakers associated with agricultural production in drought-sensitive areas.

- **Data Sources:**

The dataset is from Kaggle - Predict Droughts using Weather & Soil Data (<https://www.kaggle.com/datasets/cdminix/us-drought-meteorological-data>).

The deliverables for this project will be the raw code to develop the model, a working model, a project report, and a slide deck.