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Seunghyuk Baek sbaek44@vt.edu
Jeevan Thapa gforest5@vt.edu

Project Proposal

Introduction

Tropical storms are developed in warm ocean and approach toward US soil in late summer season every year. The intensity of a storm decreases overtime, but some of them are strong enough to survive for long time and land on the US mainland, causing massive financial damage and even casualties. Therefore, if meteorologists can predict the intensity and possible damage of a storm even before it developed from ocean, humans will be prepared much better.

Data

Tropical storm is still under research, but previous observations revealed several factors that are essential for its emergence. However, not all tropical storms can reach US mainland and cause severe damage. The storm has to be strong and last long enough for serious devastation. The intensity of a storm is determined in the warm ocean surface. However, once the storm hit the US mainland, demise of such storm is depending on the condition and temperature of land. Sometimes a tropical storm gets stronger after it hits land causing further damage. Therefore, dissipation of storm is another important factor to estimate the damage caused by a tropical storm. Thus, both weather data of sea and land need to be acquired. The data will be collected from NOAA's website (National Oceanic and Atmospheric Administration). NOAA stores various weather data for nearly 60 years. Most of data from NOAA is numeric data provided in csv format. To perform desired analysis, data from four different categories (land temperature, marine, hurricane and precipitation) will be downloaded via email link which is freely available for those who have .edu email domain. In detail, one category of data is Marine data which includes 33 characteristic features including location of data collecting device, longitude, altitude, pressure, time of data collection, wave direction, air temperature and sea surface temperature. Combining all data from four categories will provide enough features to study occurrence of tropical storm near US. These data are provided either monthly or hourly, for this study we will only focus on monthly data.

Prediction

The main focus of this study is to predict possible tropical storm that will land on US east coast and damage that will be caused by the storm. For this goal, we are focusing on supervised learning, and the type of prediction are based on numerical real values. We are planning to use linear regression models to predict the weather. Currently, there is an example algorithm to forecast weather using ANN, k-NN and Naïve Bayes Algorithms. By the end of the project, we expect to predict the incoming tropical storms and possible damages they may incur. Our result will help to save casualties by giving the correct prediction on incoming tropical storms. It will also help people to be more cautious and prepare earlier for the storm. Currently weather prediction is one of the most challenging tasks. There are so many incidents that the current weather

prediction technologies are not predicting the correct result. Our research will predict the incoming tropical storm as correctly and as early as possible. It will also predict the possible damages the storm can bring.