Executive Summary. Hurricanes that have Hit the Caribbean: Time Series & Location Analysis

Peter Morley
DA 401: Capstone Project
Dr. Supp

Hurricanes are low-pressure systems that form in the Atlantic and are known for causing tremendous amounts of damage to countries if they make landfall. These storms can cause increased precipitation rates, flooding storm surges, tornadoes, and extreme winds. All these weather variables can drastically change as well depending on the intensity of the storm.

Purpose of the Research Study

The purpose of this study is to get a better understanding of how hurricanes have been behaving in the Caribbean for the past thirty years. I believe that looking at hurricanes over time will allow researchers to better understand how hurricanes have been changing and will allow humans to be better prepared for future storms. Additionally, by looking at the location data, we can begin to see if certain areas are more prone to hurricanes than others.

Data Collection & Analysis

The data that was used was collected from the National Oceanic and Atmospheric Administration (NOAA) and the National Hurricane Center (NHC). This data set includes information regarding location (latitude & longitude) and weather data. I used time-series analysis and ANOVA tests to look at any changes over time with the weather data. To examine the location data for the hurricanes I used maps and examined any present patterns within these maps.

Overview of Findings

The results of my analysis suggest that over the past thirty years, hurricanes have slightly increased in intensity. This is because minimum pressure has slowly decreased while maximum wind speed has slowly increased over time. Additionally, my results also tell us that there are areas in the Caribbean that are more prone to hurricanes than others. As shown in Figure 1, we can see that areas above latitude 20 are more prone to experiencing hurricanes than other areas. When looking at a map this area consists of The Bahamas and the Greater Antilles. Additionally, this plot also helps show that the pattern

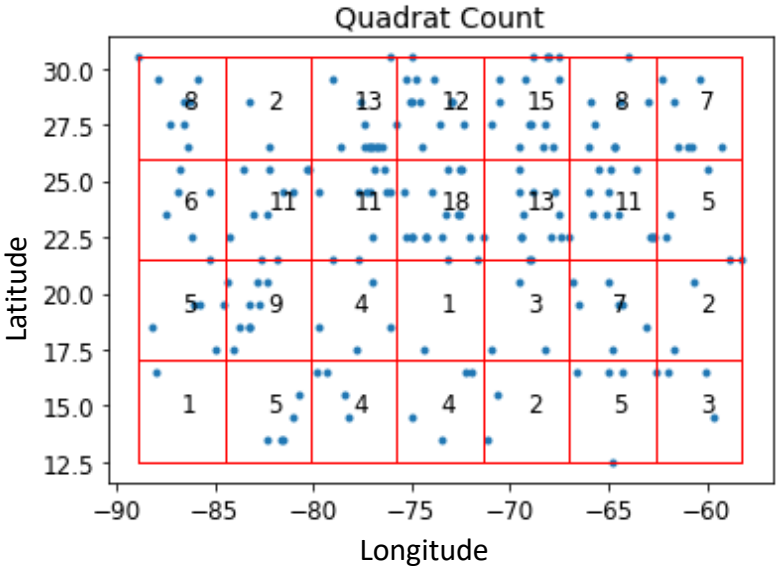

Figure 1. *Quadrat count plot displaying total occurrences.* This plot splits up the Caribbean into a 7x4 grid making 28 distinct areas in this region.

displayed in the chart is not a randomly produced pattern and that there is a trend within the data.

Recommendations

My first recommendation would be to further this analysis and look at different sources of data. For example, one could look at economic losses to locations over time due to hurricanes and examine intensity through that scope. My second recommendation is more toward the NOAA and other hurricane administrations that collect and distribute data. This would be to increase the detail and amount of data. This is because a lot of the data was missing which did not allow for more of a historical analysis.