Genny Sheara
4/15/2024
DATA-3320
Communicate the Results

I. Introduction

The purpose of this project is to compare the precipitation measured in Seattle and New York in order to effectively gauge which of the two cities is rainier. Because of the subjective nature of 'raininess' (particularly as experienced by city residents), the dataset was explored and visualized in a few different ways in order to arrive at a more comprehensive answer to the debate. Although Seattle (and the Pacific Northwest at large) is typically associated with overcast, rainy weather, an empirical approach is useful in determining how much rainfall residents actually experience.

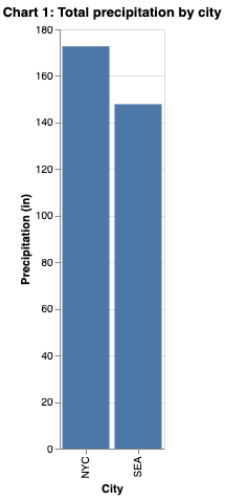
II. Data

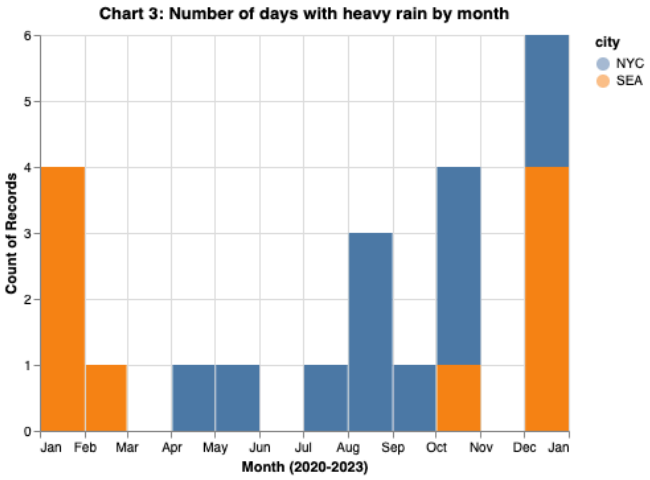
This project utilizes data recorded from multiple weather stations in each city across four years (2020 through 2023). However, some problems existed in the initial data frames, such as the fact that there were more weather stations recording data in New York City than in Seattle, rows including missing or NaN data, and information collected on snowfall and location that was irrelevant to this study. Unnecessary columns were filtered out. To make the data from each city as comparable as possible, only data from one weather station located at each city's airport (JFK and SeaTac respectively) were used. The data was condensed into one longform set that focused only on the precipitation levels, city, and date the data was collected. Finally, missing values were filled in using a simple interpolation of the surrounding values.

III. Analysis

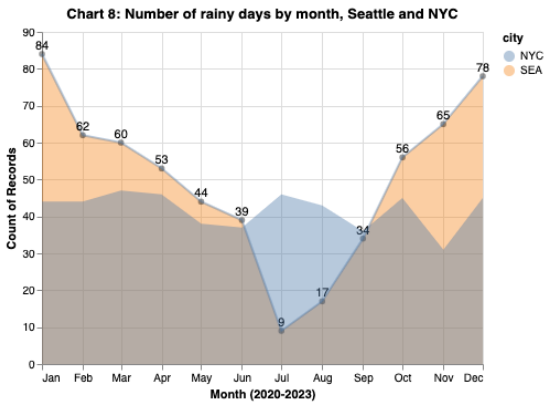
To provide the more comprehensive analysis mentioned above, two main versions of the question were used as a basis for analysis: one, which city sees a higher quantity of rainfall, and two, which city sees more rainy days. A simple comparison of the overall amount of rainfall recorded in each city initially revealed the New York City sees a higher quantity of rain, i.e. more inches of rain throughout the length of the recorded data, as demonstrated in Chart 1. The sum of inches of rainfall was 172.70 in. in New York City, compared to 147.85 in. recorded in Seattle.

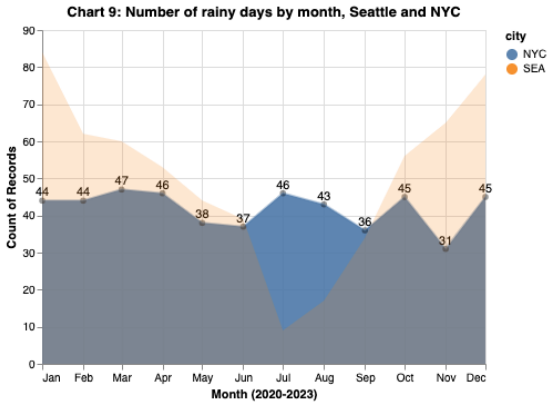
Because the impetus for this project was focused on resident or visitor experience of rainfall in the city, I also examined the difference in 'heavy rain,' which I defined as anything over 1.5 inches of rainfall measured in one day (given that heavy rain is generally defined as at least 0.3 inches of rainfall per hour, this should mean that nearly half the day was spent under heavy rain). Chart 3 demonstrates that New York City also sees a higher number of days with heavy rain, and also begins to illustrate differences in patterns between each city. While there tend to be more days with heavy rainfall in the summer months in New York, 90% of Seattle's days with heavy rain occurred in the winter months from December through February.





The number of rainy days is also a justifiable way to interpret a city's level of raininess, so I explored the temporal aspect of the data, and Seattle was shown to have an overall higher number of days with any rain measured by the weather stations. Charts 8 and 9 compare the number of rainy days by month, which confirm that in general, each month there are more rainy days in Seattle than New York City, but also emphasize a pattern between the two cities. While New York City's overall number of rainy days per month tends to stay consistent, Seattle experiences a spike in rainy days in the winter month and a dip in the summer months, similar to the pattern observed in days with heavy rain in Chart 3.





IV. Results

After exploring the data set, it seems that to a certain extent both cities can claim they experience more rain than the other. New York City sees a higher quantity of rainfall, having not only more inches of rainfall cumulatively but also more days with heavy rainfall. However, Seattle has more days with any rain at all, and also experiences a higher variation in the number of rainy days based on the month than New York City--measured across the four years, there are more months where Seattle has more rainy days than New York, with the summer months being an exception. To conclude, if a New Yorker were hoping to visit Seattle but wary of rain, the summer months should likely see a lower quantity of rainfall and a lower number of rainy days in Seattle than New York.